

March 2013

Off-Post

Quarterly Groundwater Monitoring Report



Prepared For

**Department of the Army
Camp Stanley Storage Activity
Boerne, Texas**

July 2013

EXECUTIVE SUMMARY

- A total of 16 off-post samples were scheduled to be collected during the March 2013 monitoring event and all samples were collected.
- Analyses indicated off-post well RFR-10 exceeded the maximum contaminant level (MCL) for Tetrachloroethene (PCE). This well is equipped with a granular activated carbon (GAC) filtration system.
- GAC-filtered samples were collected in March 2013 and all analyses were non-detect indicating the GAC filtration systems are functioning properly. The next GAC-filtered samples will be collected during the September 2013 event.
- Semi-annual GAC maintenance was performed in January 2013. This involved replacing the first carbon canister in each GAC unit and other routine maintenance. The next scheduled carbon change-out will be due in July 2013.

GEOSCIENTIST CERTIFICATION

March 2013 Off-Post Quarterly Groundwater Monitoring Report

For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

I, W. Scott Pearson, P.G., hereby certify that the 2013 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 2013, and is true and accurate to the best of my knowledge and belief.





W. Scott Pearson, P.G.
State of Texas
Geology License No. 2186

7-24-2013

Date

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ABBREVIATIONS AND ACRONYMS

AOC	Area of Concern
APPL	Agriculture & Priority Pollutant Laboratory
CSSA	Camp Stanley Storage Activity
DCE	Dichloroethene
DQO	Data Quality Objective
FD	Field Duplicate
FO	Fair Oaks
GAC	Granular Activated Carbon
HS	Hidden Springs
I10	Interstate Highway 10
ISCO	In-Situ Chemical Oxidation
JW	Jackson Woods
LS	Leon Springs
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
OFR	Old Fredericksburg Road
OW	The Oaks Water Supply Corporation
Parsons	Parsons Government Services, Inc.
PCE	Tetrachloroethene
P.G.	Professional Geologist
QAPP	Quality Assurance Program Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RFR	Ralph Fair Road
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SDWA	Safe Drinking Water Act
SWMU	Solid Waste Management Unit
SLD	Scenic Loop Drive
TCE	Trichloroethene
THM	Trihalomethanes
VOC	Volatile Organic Compound

MARCH 2013 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 2013 by Parsons Government Services, Inc. (Parsons) 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 2013 quarterly monitoring events (March, June, September, and December) will be described in detail in an Annual Report to be submitted after December 2013. 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 11 and 12, 2013. 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 Data Quality Objective Attainment for this 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 Act (SDWA) 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 2013 ANALYTICAL RESULTS

During the March 2013 event, a groundwater sample was collected from 9 off-post wells shown in **Figure 2.1**. 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 and were also collected this event. **Table 2.1** includes the rationale for selection of the wells sampled in March 2013, and **Figure 2.1** provides well locations for the following sampled wells:

- One privately-owned well (I10-4 [unused]) in the Interstate-10 area;
- Three wells in the Leon Springs Villa area (one public well: LS-6; two privately-owned wells: LS-5 and LS-7);
- One privately-owned well on Old Fredericksburg Road (OFR-3);
- Two privately-owned wells (RFR-10 and RFR-11) in the Ralph Fair Road area; and
- Two public supply wells from The Oaks Water Supply System (OW-BARNOWL and OW-HH2).

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. One well (I10-4) was sampled using a disposable bailer. The samples from these wells are not subject to purging/sample parameter requirements.

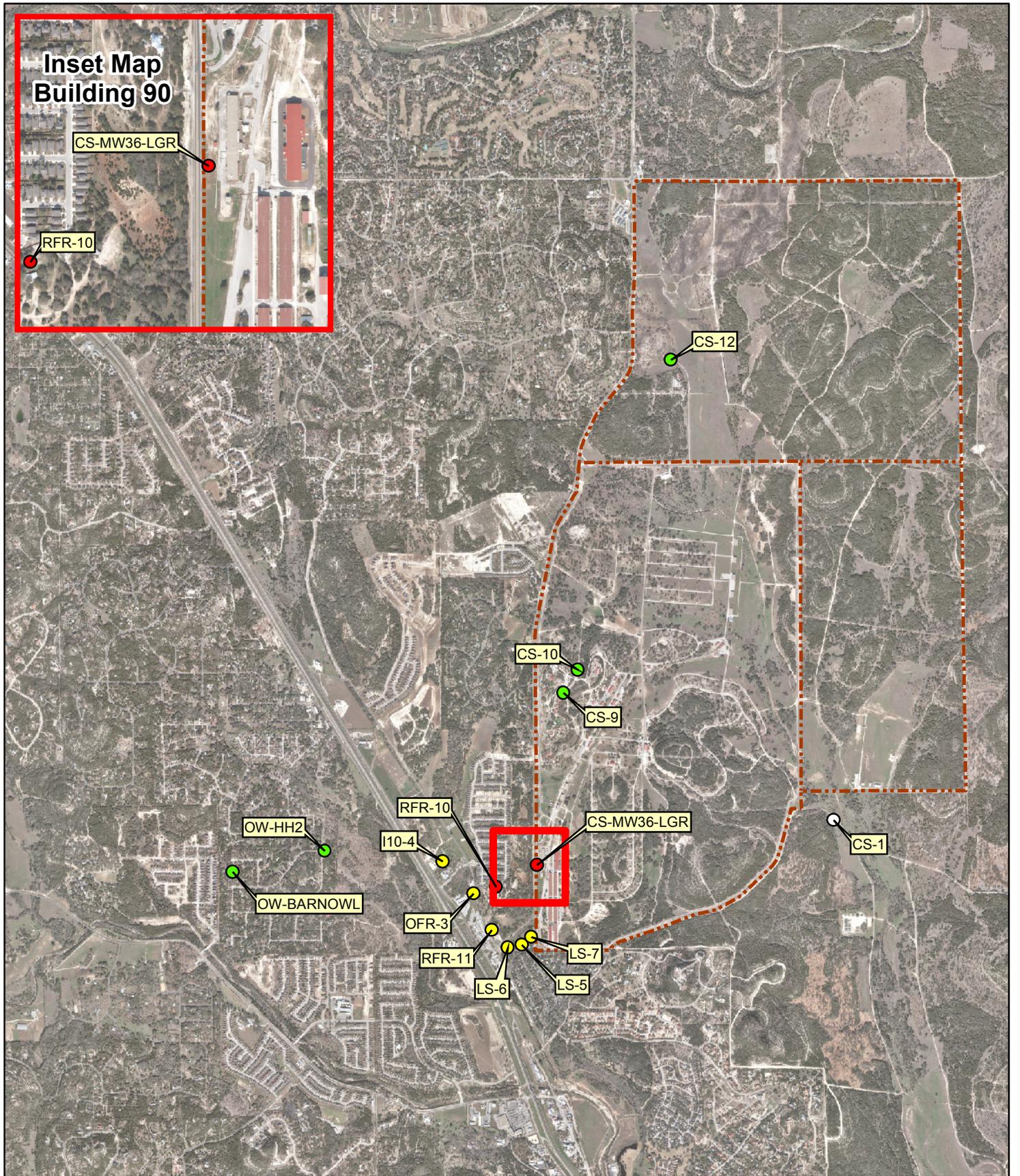
A total of 16 groundwater samples, two field duplicate (FD) samples, one matrix spike/matrix spike duplicate (MS/MSD) pair, and two trip blanks were submitted to Agriculture & Priority Pollutant Laboratory (APPL) in Clovis, California for analysis. Groundwater samples were analyzed for the short list of VOCs using SW-846 Method 8260B. The approved short list of VOCs includes *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,2-DCE, 1,1-DCE, Tetrachloroethene (PCE), Trichloroethene (TCE), and vinyl chloride.

Concentrations of the VOCs detected in March 2013 are presented in **Table 2.2**. Full analytical results from the March 2013 sampling event are presented in **Appendix B**. As shown in **Table 2.1**, 16 samples were scheduled for collection in March 2013 and all 16 samples were collected.

The data packages (Parsons internal reference 748350-#118) 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 data packages April 4, 2013.

In January 2013, 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 and will be collected again during the September 2013 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 1.5 miles west to OW-BARNOWL (**Figure 2.1**).



0 1,500 3,000 4,500 6,000 Feet

PCE Concentrations (µg/L)

- > MCL (VOCs only)
- > RL (VOCs only)
- > MDL (VOCs only)
- ND (VOCs only)
- Fence Line

Figure 2.1

On-Post and Off-Post Well Sampling Locations for March 2013
Camp Stanley Storage Activity

PARSONS

Table 2.2 March 2013 Off-Post Groundwater Results, Detected Analytes Only

Subdivision	Well ID	Sample Date	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride	Comments
IH-10	I10-4	3/12/2013	--	--	--	4.77	2.0	--	PCE last above the MCL June 2012.
Leon Springs Villas	LS-5	3/11/2013	--	--	--	0.80F	2.67	--	TCE consistently above the RL since 2008.
	LS-5-A2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
	LS-6	3/11/2013	--	--	--	0.87F	2.7	--	TCE above the RL since Sept. 2011.
	LS-6-A2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
	LS-7	3/11/2013	--	--	--	2.04	0.41F	--	PCE above the RL since 2008.
	LS-7-A2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
Old Fredericksburg Road	OFR-3	3/11/2013	--	--	--	3.18	2.87	--	PCE/TCE below the MCL for the second consecutive quarter.
	OFR-3-A2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
	OFR-3-A2 FD	3/11/2013	--	--	--	--	--	--	Post-GAC sample
Ralph Fair Road	RFR-10	3/11/2013	--	--	--	8.44	3.21	--	PCE remains above the MCL for the 7th consecutive quarter.
	RFR-10-A2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
	RFR-10-B2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
	RFR-11	3/11/2013	--	--	--	0.59F	2.32	--	TCE consistently above the RL since 2010.
	RFR-11-A2	3/11/2013	--	--	--	--	--	--	Post-GAC sample
The Oaks Water Supply	OW-BARNOWL	3/12/2013	--	--	--	--	--	--	No detections in either of these wells since the initial February 2011 f-flagged detection of PCE.
	OW-BARNOWL FD	3/12/2013	--	--	--	--	--	--	
	OW-HH2	3/12/2013	--	--	--	--	--	--	
Laboratory Detection Limits & Maximum Contaminant Level									
Method Detection Limit (MDL)			0.12	0.07	0.08	0.06	0.05	0.08	
Reporting Limit (RL)			1.2	1.2	0.6	1.4	1	1.1	
Max. Contaminant Level (MCL)			7	70	100	5	5	2	

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.
VOC data reported in µg/L.
Abbreviations/Notes:
FD Field Duplicate
TCE Trichloroethene
PCE Tetrachloroethene
DCE Dichloroethene

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.

3.0 SUMMARY AND RECOMMENDATIONS

Results of the March 2013 sampling are summarized as follows:

- Nine wells and 7 post-GAC samples were scheduled for sampling in March 2013. All wells scheduled for sampling were sampled.
- Well RFR-10 exceeded the MCL in March 2013 for PCE. This well is equipped with a GAC filtration system.
- PCE and/or TCE were detected above the RLs in public and/or private drinking water wells I10-4, LS-5, LS-6, LS-7, OFR-3, and RFR-11. Wells LS-5, LS-6, LS-7, OFR-3, and RFR-11 have GAC treatment systems in place and well I10-4 is unused.
- 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, and vinyl chloride were not detected in any of the off-post wells in March 2013.
- GAC-filtered samples were collected in March 2013. All GAC-filtered samples were non-detect indicating the GAC units are functioning properly. The next GAC-filtered samples will be collected in September 2013.
- Semi-annual GAC maintenance, including carbon change-out, was performed in January 2013; the next semi-annual GAC maintenance will be due in July 2013.
- Additional attempts were made in April 2013 to obtain an access agreement from the Compass Bank, south of CSSA. The agreement was passed on to the corporate office by our contact.
- In accordance with project DQOs, the rationale for the selection of 9 samples to be collected in June 2013 is provided in **Table 3.1**.

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 (§2.3.1 of the DQOs for the Groundwater Contamination Investigation, revised November 2010).	Samples for laboratory analysis were collected from selected off-post public and private wells, which are located within a 2.5 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 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
	<p>Evaluate CSSA monitoring program and expand as necessary (§2.3.1 of the DQOs for the Groundwater Contamination Investigation, revised November 2010). Determine locations of future monitoring locations.</p>	<p>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.</p>	<p>Yes</p>	<p>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.</p>
<p>Project schedule/ Reporting</p>	<p>The quarterly monitoring project schedule shall provide a schedule for sampling, analysis, validation, verification, reviews, and reports for monitoring events off-post.</p>	<p>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.</p>	<p>Yes</p>	<p>Continue quarterly reporting to include a schedule for sampling, analysis, validation, and verification and data review and data reports.</p>

Activity	Objectives	Action	Objective Attained?	Recommendations
Remediation	Evaluate the effectiveness of GACs (§3.2.3) and install as needed (§3.2.5 both of the DQOs for the Groundwater Contamination Investigation, revised November 2010).	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 2013 QUARTERLY OFF-POST
GROUNDWATER ANALYTICAL RESULTS

Appendix B
March 2013 Quarterly Off-post Groundwater Analytical Results

Well ID	Sample Date	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride
I10-4	3/12/2013	0.12U	0.07U	0.08U	4.77	2.0	0.08U
LS-5	3/11/2013	0.12U	0.07U	0.08U	0.80F	2.67	0.08U
LS-5-A2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-6	3/11/2013	0.12U	0.07U	0.08U	0.87F	2.7	0.08U
LS-6-A2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
LS-7	3/11/2013	0.12U	0.07U	0.08U	2.04	0.41F	0.08U
LS-7-A2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OFR-3	3/11/2013	0.12U	0.07U	0.08U	3.18	2.87	0.08U
OFR-3-A2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OFR-3-A2 FD	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-10	3/11/2013	0.12U	0.07U	0.08U	8.44	3.21	0.08U
RFR-10-A2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-10-B2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
RFR-11	3/11/2013	0.12U	0.07U	0.08U	0.59F	2.32	0.08U
RFR-11-A2	3/11/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-BARNOWL	3/12/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-BARNOWL FD	3/12/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U
OW-HH2	3/12/2013	0.12U	0.07U	0.08U	0.06U	0.05U	0.08U

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.

VOC data reported in µg/L.

Abbreviations/Notes:

FD Field Duplicate
TCE Trichloroethene
PCE Tetrachloroethene
DCE Dichloroethene

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**

(Laboratory data packages are submitted to CSSA electronically.)

SDG 70137

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 groundwater samples and the associated field quality control (QC) samples collected from off-post Camp Stanley Storage Activity (CSSA) on March 11 and 12, 2013. The samples were assigned to the following Sample Delivery Group (SDG) and were analyzed for volatile organic compounds (VOCs):

70137

The field QC samples associated with this SDG included two field duplicates (FDs), one pair of matrix spike/matrix spike duplicate (MS/MSD), and 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 QC samples were analyzed for VOCs.

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. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 2.0°C, which was within the 2-6°C range recommended by the CSSA QAPP.

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 twenty-one (21) samples, including sixteen (16) off-post groundwater samples, two (2) FD samples, one (1) set of MS/MSD, and one (1) TB. The samples were collected on March 11 and 12, 2013 and were analyzed for a reduced list of VOCs which included: 1,1-dichloroethene, *cis*-1,2-dichloroethene, tetrachloroethene, *trans*-1,2-dichloroethene, trichloroethene, and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in two (2) batches (#175515 and #175517) under one set of initial calibration (ICAL) with the same instrument. 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 two laboratory control spike (LCS) samples, MS/MSD, and the surrogate spikes. Sample LS-6 was designated for matrix spike/matrix spike duplicate (MS/MSD) analysis on the COC.

All two LCSs, MS, MSD, and surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the two pairs of parent and FD analyte results and MS/MSD results.

All RPDs of MS/MSD were compliant.

None of the target VOCs was detected at or above the reporting limit (RL) in the parent/FD pair of samples OFR-3-A2 and OW-BARNOWL.

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 trip and laboratory blanks for cross contamination of samples during 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.
- The two LCS samples were prepared using a secondary source. All second source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

There were two method blanks and one TB associated with the VOC analyses in this SDG. All blanks were non-detect for all target VOCs. No target VOC was detected at or above the associated MDL in the two method blanks.

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%.