SEPTEMBER 2016

On-Post
Quarterly Groundwater Monitoring Report

Prepared For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

December 2016

EXECUTIVE SUMMARY

- Groundwater samples were collected from all 31 wells scheduled for monitoring at Camp Stanley Storage Activity (CSSA) in September 2016.
- CSSA experienced above average precipitation volumes during the 3rd quarter of 2016; however, the aquifer still experienced a significant decrease from July to September, 2016. This is likely due to abnormally high groundwater levels measured during the 2nd quarter of 2016. The weather station (WS) at Area of Concern (AOC)-65 (AOC-65 WS) recorded 15.57 inches of rainfall, and the B-3 weather station (B-3 WS) recorded 15.88 inches of rainfall. The average rainfall for this area from July to September is 9.67 inches.
- At CSSA, the Middle Trinity aquifers' average groundwater elevation in September 2016 decreased 85.26 feet from the elevations measured in June 2016. The average depth to water in the wells was 166.93 feet below top of casing (BTOC) or 1,074.62 feet above mean sea level (MSL). As such, the Trinity-Glen Rose Groundwater Conservation District (TGRGCD) remains in Stage 1 Moderate Drought conditions since August 13, 2015. For the adjacent Edwards aquifer, the San Antonio Water System (SAWS) also remains in 'year round watering hours' since December 2, 2015.
- The maximum contaminant level (MCL) was exceeded in monitoring wells CS-D, CS-MW1-LGR, CS-MW5-LGR, and CS-MW36-LGR for trichloroethene (TCE) and/or Tetrachloroethene (PCE) in September 2016.
- No wells sampled had metal detections above their corresponding MCL, action level (AL), or secondary standard (SS) in September 2016.
- Thirty-eight zones were scheduled for sampling in September 2016 from Westbay wells CS-WB01 through CS-WB04. Six zones were unable to be sampled due to being dry. Thirteen of the 32 zones sampled had volatile organic compound (VOC) concentrations above the MCL.
- With the approval of the 2015 Data Quality Objectives (DQOs) by the Texas Commission on Environmental Quality (TCEQ) and United States Environmental Protection Agency (USEPA), metals samples are no longer collected from on-post monitoring wells associated with routine groundwater monitoring. However, the 2015 DQOs do prescribe metals sampling at the public water supply wells, and in support of active remediation actions at AOC-65 and B-3. This September 2016 sampling event initiates the new DQOs, and as such metals samples were not obtained from monitoring wells. There were no metals detected above the MCL/AL/SS in the public supply wells sampled in September 2016.
- The 2015 long term monitoring optimization (LTMO) report has been submitted and approved by the TCEQ and USEPA. The new LTMO will be implemented during the December 2016 groundwater event. Changes will include modifications in the sample collection frequency and analytical parameters in selected wells.

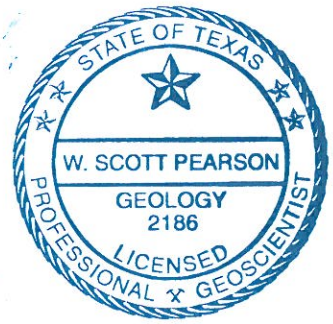
GEOSCIENTIST CERTIFICATION

SEPTEMBER 2016 ON-POST QUARTERLY GROUNDWATER MONITORING REPORT

FOR

DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

I, W. Scott Pearson, Professional Geologist (P.G.), hereby certify that the September 2016 On-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 CSSA Environmental Office, laboratory data provided by APPL Laboratories, and field data obtained during groundwater monitoring conducted at the site in September 2016, and is true and accurate to the best of my knowledge and belief.



W. Scott Pearson

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

12-30-2016

Date

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ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
1,1-DCE	1,1-dichloroethene
§3008(h) Order	RCRA 3008(h) Administrative Order on Consent
AL	Action Level
AOC	Area of Concern
APPL	Agriculture and Priority Pollutants Laboratories, Inc.
BS	Bexar Shale
BTOC	below top of casing
CC	Cow Creek
cis-1,2-DCE	*cis*-1,2-Dichloroethene
COC	constituents of concern
CSSA	Camp Stanley Storage Activity
DQO	Data Quality Objectives
HSP	Health and Safety Plan
ISCO	In-Situ Chemical Oxidation
LGR	Lower Glen Rose
LTMO	Long-Term Monitoring Optimization
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MSL	mean sea level
NA	Not Available
PCE	Tetrachloroethene
P.G.	Professional Geologist
Parsons	Parsons Government Services, Inc.
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SAWS	San Antonio Water System
SS	Secondary Standard
SWMU	Solid Waste Management Units
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TGRGCD	Trinity-Glen Rose Groundwater Conservation District
trans-1,2-DCE	*trans*-1,2-Dichloroethene
UGR	Upper Glen Rose
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WS	Weather Station

SEPTEMBER 2016 GROUNDWATER MONITORING REPORT CAMP STANLEY STORAGE ACTIVITY, TEXAS

1.0 INTRODUCTION

This report presents results from the on-post quarterly sampling performed at Camp Stanley Storage Activity (CSSA) in September 2016. Laboratory analytical results are presented along with potentiometric contour maps. Results from all four 2016 quarterly monitoring events (March, June, September, and December) will be described in detail in the 2016 Annual Report. 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. For this specific quarter, groundwater monitoring was performed September 6 through October 3, 2016 by Parsons Government Services, Inc. (Parsons).

Current objectives of the groundwater monitoring program are to determine groundwater flow direction and elevations, determine groundwater contaminant concentrations for characterization purposes, and identify meteorological and seasonal variations in physical and chemical properties. **Appendix A** identifies the data quality objectives (DQOs) for CSSA's groundwater monitoring program, along with an evaluation of whether each DQO was attained. The objectives listed in **Appendix A** also reference appropriate sections of the Resource Conservation and Recovery Act (RCRA) **§3008(h) Administrative Order on Consent** [§3008(h) Order].

The CSSA groundwater monitoring program follows the provisions of the groundwater monitoring program DQOs as well as the recommendations of the **Three-Tiered Long Term Monitoring Network Optimization (LTMO) Evaluation (Parsons, 2015)** which provided recommendations for sampling based on an LTMO study performed for the CSSA groundwater monitoring program. The LTMO evaluation was updated in 2015 using groundwater data from monitoring conducted between 2010 and 2015. The proposed LTMO changes/updates were approved by the TCEQ and USEPA April 22 and May 5, 2016, respectively. These changes will be briefed to the public in the 2016 Annual Fact Sheet. The updated LTMO study sampling frequencies will be implemented in December 2016.

In conjunction with the off-post monitoring initiative (under a separate report) the September 2016 groundwater event represents the final area-wide "snapshot" event to be collected under the 2010 LTMO. The next regional snapshot event will be collected in June 2017. From that point forward, the snapshot events will follow a 15-month schedule.

2.0 POST-WIDE FLOW DIRECTION AND GRADIENT

After above average rainfall in 2015 and continued steady rain events in early 2016, the San Antonio Water System (SAWS) restrictions remain under 'year round watering hours' since December 2, 2015. The Trinity-Glen Rose Groundwater Conservation District (TGRGCD) remains in Stage 1 water restrictions since August 13, 2015.

The 30-year precipitation normal for the San Antonio area is 8.01 inches of rainfall for the three-month period of July through September. Over the 3-month period of record, the weather station (WS) at Area of Concern (AOC)-65 (AOC-65 WS), recorded 15.57 inches of rainfall (0.66 inches in June, 8.89 inches in August, and 6.02 inches in September). Two days in August and 3 days in September had daily rainfall totals in excess of 1 inch at AOC-65. Likewise, the B-3 weather station (B-3 WS) recorded 15.88 inches during this same timeframe (0.79 inches in June, 8.13 inches in August, and 6.96 inches in September). At B-3, daily precipitation events in excess of 1 inch occurred twice both in August and September.

Fifty-five water level measurements were recorded on September 23, 2016 from on- and off-post monitoring wells completed in the Lower Glen Rose (LGR), Bexar Shale (BS), and Cow Creek (CC) formational members of the Middle Trinity Aquifer (**Tables 2.1 and 2.2**). The groundwater potentiometric surface maps illustrating groundwater elevations from the LGR, BS, and CC zones in September 2016 are shown in **Figures 2.1, 2.2, and 2.3**, respectively.

The June 2016 potentiometric surface map for LGR-screened wells **(Figure 2.1)** exhibited a wide range of groundwater elevations, from a minimum of 943.79 feet above mean sea level (MSL) at B3-EXW01 to a maximum of 1,139.05 feet above MSL at CS-MW04-LGR. Groundwater elevations are generally higher in the northern and central portions of CSSA, and decrease to the southwest and southeast. As measured in all non-pumping LGR wells, the average groundwater elevation in June 2016 decreased 85.26 feet from the elevations measured in June 2016, but is still well above the average groundwater level for the area. The groundwater elevation is approximately 43 feet above the 13.75 year average elevation measured in CSSA monitoring wells (**Figure 2.4**).

Well CS-MW4-LGR, located in the central portion of CSSA, typically has one of the highest groundwater elevations of LGR-screened wells. Under average and above-average aquifer elevations, the groundwater level is 20 to 30 feet higher than the nearest comparable wells (CS-MW2-LGR and CS-MW5-LGR), creating a pronounced groundwater mound in the central portion of the facility. In September 2016 this mounding effect was observable as the elevation in CS-MW4-LGR was approximately 56 feet higher than both CS-MW2-LGR and CS-MW5-LGR. Long-term monitoring has ascertained that when groundwater in the vicinity of CS-MW4-LGR rises above about 970 feet MSL, the mounding effect is evident. As measured in September 2016, the water elevation at CS-MW4-LGR was 1,139.05 feet MSL, and the typical mounding effect was evident.

Table 2.1
Measured Groundwater Elevation
September 2016

Well ID:	TOC elevation (ft MSL)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft MSL)	Formations Screened			Date
				LGR	BS	CC	
CS-1	1169.27	125.30	1043.97	X			9/23/2016
CS-2	**1237.59**	**175.92**	**1061.67**	X	?		9/23/2016
CS-3	1240.17	175.05	1065.12	X			9/23/2016
CS-4	1229.28	164.99	1064.29	X			9/23/2016
CS-10	**1331.51**	**271.90**	**1059.61**	**ALL**			9/23/2016
CS-12	**1274.09**	**207.90**	**1066.19**	**ALL**			9/23/2016
CS-13	**1193.26**	**128.95**	**1064.31**	**ALL**			9/23/2016
CS-D	1236.03	175.12	1060.91	X			9/23/2016
CS-MWG-LGR	1328.14	238.98	1089.16	X			9/23/2016
CS-MWH-LGR	1319.19	245.49	1073.70	X			9/23/2016
CS-I	1315.20	233.20	1082.00	X			9/23/2016
CS-MW1-LGR	1220.73	148.29	1072.44	X			9/23/2016
CS-MW1-BS	1221.09	137.19	1083.90		X		9/23/2016
CS-MW1-CC	1221.39	156.45	1064.94			X	9/23/2016
CS-MW2-LGR	1237.08	154.00	1083.08	X			9/23/2016
CS-MW2-CC	1240.11	172.53	1067.58			X	9/23/2016
CS-MW3-LGR	1334.14	257.76	1076.38	X			9/23/2016
CS-MW4-LGR	1209.71	70.66	1139.05	X			9/23/2016
CS-MW5-LGR	1340.24	257.08	1083.16	X			9/23/2016
CS-MW6-LGR	1232.25	154.55	1077.70	X			9/23/2016
CS-MW6-BS	1232.67	122.06	1110.61		X		9/23/2016
CS-MW6-CC	1233.21	152.25	1080.96			X	9/23/2016
CS-MW7-LGR	1202.27	132.94	1069.33	X			9/23/2016
CS-MW7-CC	1201.84	126.54	1075.30			X	9/23/2016
CS-MW8-LGR	1208.35	132.42	1075.93	X			9/23/2016
CS-MW8-CC	1206.13	129.48	1076.65			X	9/23/2016
CS-MW9-LGR	1257.27	190.78	1066.49	X			9/23/2016
CS-MW9-BS	1256.73	171.54	1085.19		X		9/23/2016
CS-MW9-CC	1255.95	189.21	1066.74			X	9/23/2016
CS-MW10-LGR	1189.53	122.01	1067.52	X			9/23/2016
CS-MW10-CC	1190.04	129.88	1060.16			X	9/23/2016
CS-MW11A-LGR	1204.03	155.09	1048.94	X			9/23/2016
CS-MW11B-LGR	1203.52	152.71	1050.81	X			9/23/2016
CS-MW12-LGR	1259.07	188.43	1070.64	X			9/23/2016
CS-MW12-BS	1258.37	162.28	1096.09		X		9/23/2016
CS-MW12-CC	1257.31	186.84	1070.47			X	9/23/2016
CS-MW16-LGR*	1244.60	216.78	1027.82	X			9/23/2016
CS-MW16-CC*	1244.51	261.23	983.28			X	9/23/2016
B3-EXW01*	1245.26	301.47	943.79	X			9/23/2016
B3-EXW02	1249.66	175.42	1074.24	X			9/23/2016
B3-EXW03	1235.11	168.74	1066.37	X			9/23/2016
B3-EXW04	1228.46	202.41	1026.05	X			9/23/2016
B3-EXW05	1279.46	209.34	1070.12	X			9/23/2016
CS-MW17-LGR	1257.01	186.81	1070.20	X			9/23/2016
CS-MW18-LGR	1283.61	212.22	1071.39	X			9/23/2016
CS-MW19-LGR	1255.53	169.53	1086.00	X			9/23/2016
CS-MW20-LGR	1209.42	116.11	1093.31	X			9/23/2016
CS-MW21-LGR	1184.53	112.44	1072.09	X			9/23/2016
CS-MW22-LGR	1280.49	213.31	1067.18	X			9/23/2016
CS-MW23-LGR	1258.20	196.64	1061.56	X			9/23/2016
CS-MW24-LGR	1253.90	191.05	1062.85	X			9/23/2016
CS-MW25-LGR	1293.01	220.01	1073.00	X			9/23/2016
CS-MW35-LGR	1186.97	122.81	1064.16	X			9/23/2016
CS-MW36-LGR	1218.74	141.51	1077.23	X			9/23/2016
FO-20	**NA**	**NA**	**1082.30**	**ALL**			9/23/2016
Number of wells screened in each formation.				**38**	**4**	**9**	
Average groundwater elevation in each formation given in feet (non pumping wells).				**1073.95**	**1093.95**	**1070.35**	

Notes:

Bold wells: CS-2, CS-9, CS-10, CS-12, CS-13, and FO-20 are open boreholes across more than one formational u

? = Exact screening information unknown for this well.

Shaded wells are routinely pumped for either domestic, livestock, or environmental remediation purposes, and therefore are not used in calculating statistics.

CS-1, CS-9, CS-10, CS-12, and CS-13 are current, inactive, or future drinking water wells.

CS-MW16-LGR, CS-MW16-CC, B3-EXW01 through B3-EXW05 pumps are cycling continuously to feed the B-3 Bioreactor.

* = submersible pump running at time of water level measurement.

Formational average groundwater elevation is calculated from non-pumping wells screened in only one format

All measurements given in feet.

NA = Data not available

Table 2.2
Change in Groundwater Elevation from Previous Quarter
September 2016

Well ID	June 2016 Elevations	Sept. 2016 Elevations	GW elevation change (Sept. minus June)	Formations Screened		
				LGR	BS	CC
CS-1	1058.37	1043.97	**-14.40**	**X**		
CS-2	**1182.87**	**1061.67**	**-121.20**	**X**	**?**	
CS-3	1177.81	1065.12	-112.69	**X**		
CS-4	1176.57	1064.29	-112.28	**X**		
CS-10	**1165.41**	**1059.61**	-105.80	**ALL**		
CS-12	**1133.29**	**1066.19**	-67.10	**ALL**		
CS-13	**1135.93**	**1064.31**	**-71.62**	**ALL**		
CS-D	1164.27	1060.91	-103.36	**X**		
CS-MWG-LGR	1144.41	1089.16	-55.25	**X**		
CS-MWH-LGR	1164.93	1073.70	-91.23	**X**		
CS-I	1160.65	1082.00	-78.65	**X**		
CS-MW1-LGR	1174.00	1072.44	-101.56	**X**		
CS-MW1-BS	1109.53	1083.90	-25.63		**X**	
CS-MW1-CC	1133.61	1064.94	-68.67			**X**
CS-MW2-LGR	1162.87	1083.08	-79.79	**X**		
CS-MW2-CC	1111.49	1067.58	-43.91			**X**
CS-MW3-LGR	1152.82	1076.38	-76.44	**X**		
CS-MW4-LGR	1182.31	1139.05	-43.26	**X**		
CS-MW5-LGR	1155.09	1083.16	-71.93	**X**		
CS-MW6-LGR	1160.80	1077.70	-83.10	**X**		
CS-MW6-BS	1148.45	1110.61	-37.84		**X**	
CS-MW6-CC	1150.30	1080.96	-69.34			**X**
CS-MW7-LGR	1160.36	1069.33	-91.03	**X**		
CS-MW7-CC	1150.16	1075.30	-74.86			**X**
CS-MW8-LGR	1157.89	1075.93	-81.96	**X**		
CS-MW8-CC	1150.10	1076.65	-73.45			**X**
CS-MW9-LGR	1174.68	1066.49	-108.19	**X**		
CS-MW9-BS	1173.87	1085.19	-88.68		**X**	
CS-MW9-CC	1150.44	1066.74	-83.70			**X**
CS-MW10-LGR	1147.18	1067.52	-79.66	**X**		
CS-MW10-CC	1147.99	1060.16	-87.83			**X**
CS-MW11A-LGR	1153.55	1048.94	-104.61	**X**		
CS-MW11B-LGR	1151.12	1050.81	-100.31	**X**		
CS-MW12-LGR	1177.64	1070.64	-107.00	**X**		
CS-MW12-BS	1156.86	1096.09	-60.77		**X**	
CS-MW12-CC	1150.46	1070.47	-79.99			**X**
CS-MW16-LGR*	1113.38	1027.82	-85.56	**X**		
CS-MW16-CC*	1128.14	983.28	-144.86			**X**
B3-EXW01*	1151.56	943.79	-207.77	**X**		
B3-EXW02	1158.33	1074.24	-84.09	**X**		
B3-EXW03	1182.28	1066.37	-115.91	**X**		
B3-EXW04	1184.27	1026.05	-158.22	**X**		
B3-EXW05	1040.97	1070.12	29.15	**X**		
CS-MW17-LGR	1164.46	1070.20	-94.26	**X**		
CS-MW18-LGR	1168.56	1071.39	-97.17	**X**		
CS-MW19-LGR	1177.32	1086.00	-91.32	**X**		
CS-MW20-LGR	1176.53	1093.31	-83.22	**X**		
CS-MW21-LGR	1179.32	1072.09	-107.23	**X**		
CS-MW22-LGR	1173.63	1067.18	-106.45	**X**		
CS-MW23-LGR	1164.78	1061.56	-103.22	**X**		
CS-MW24-LGR	1178.67	1062.85	-115.82	**X**		
CS-MW25-LGR	1158.64	1073.00	-85.64	**X**		
CS-MW35-LGR	1149.23	1064.16	-85.07	**X**		
CS-MW36-LGR	1158.75	1077.23	-81.52	**X**		
FO-20	**1177.94**	**1082.3**	-95.64	**ALL**		
Average groundwater elevation change (all wells minus pumping wells)			**-85.26**			
Average groundwater elevation change in each formation (non pumping wells)				**-92.26**	**-53.23**	**-72.72**

Notes:

Bold wells: CS-2, CS-9, CS-10, CS-12, CS-13, and FO-20 are open boreholes across more than one formational unit.

? = Exact screening information unknown for this well.

Shaded wells are routinely pumped for either domestic, livestock, or environmental remediation purposes, and therefore are not used in calculating statistics.

CS-1, CS-9, CS-10, CS-12, and CS-13 are current, inactive, or future drinking water wells.

CS-MW16-LGR, CS-MW16-CC, B3-EXW01 through B3-EXW05 pumps are cycling continuously to feed the B-3 Bioreactor.

* = submersible pump running at time of water level measurement.

Formational average groundwater elevation change is calculated from non-pumping wells screened in only one formation.

All measurements given in feet.

NA = Data not available

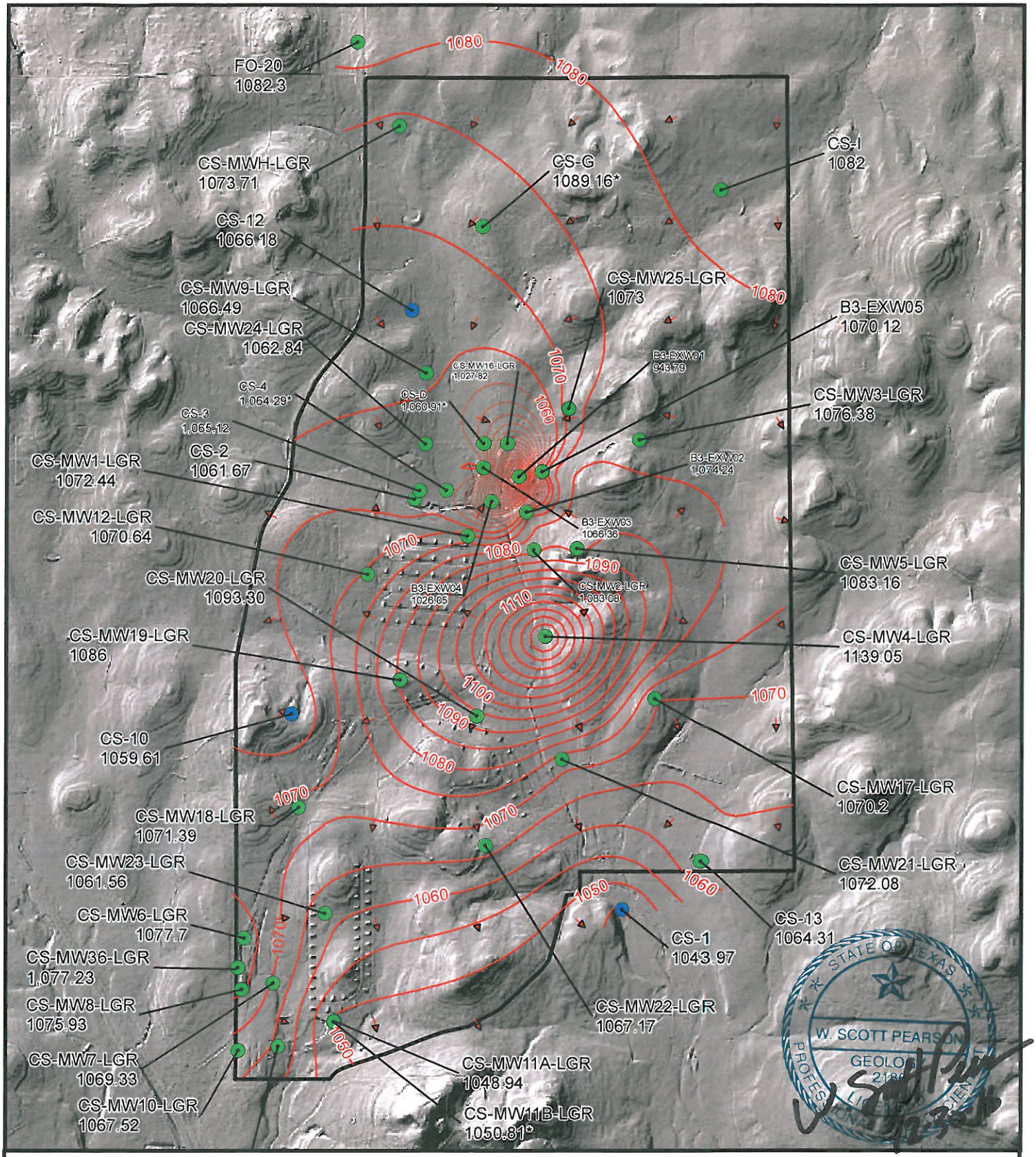


Figure 2.1

September 2016 Potentiometric Surface Map, LGR Wells

Camp Stanley Storage Activity

PARSONS

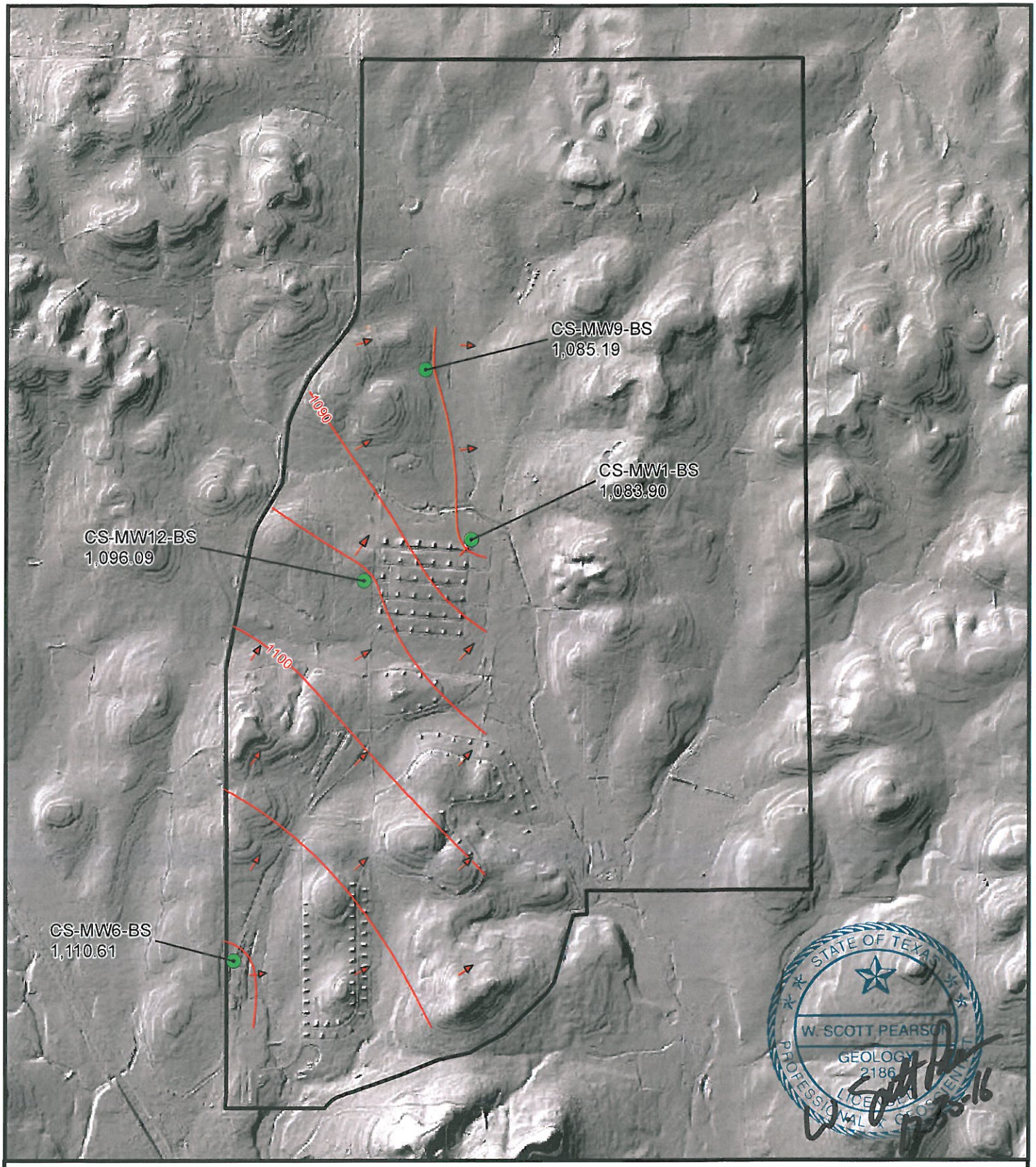


Figure 2.2

September 2016 Potentiometric Surface Map, BS Wells

Camp Stanley Storage Activity

PARSONS

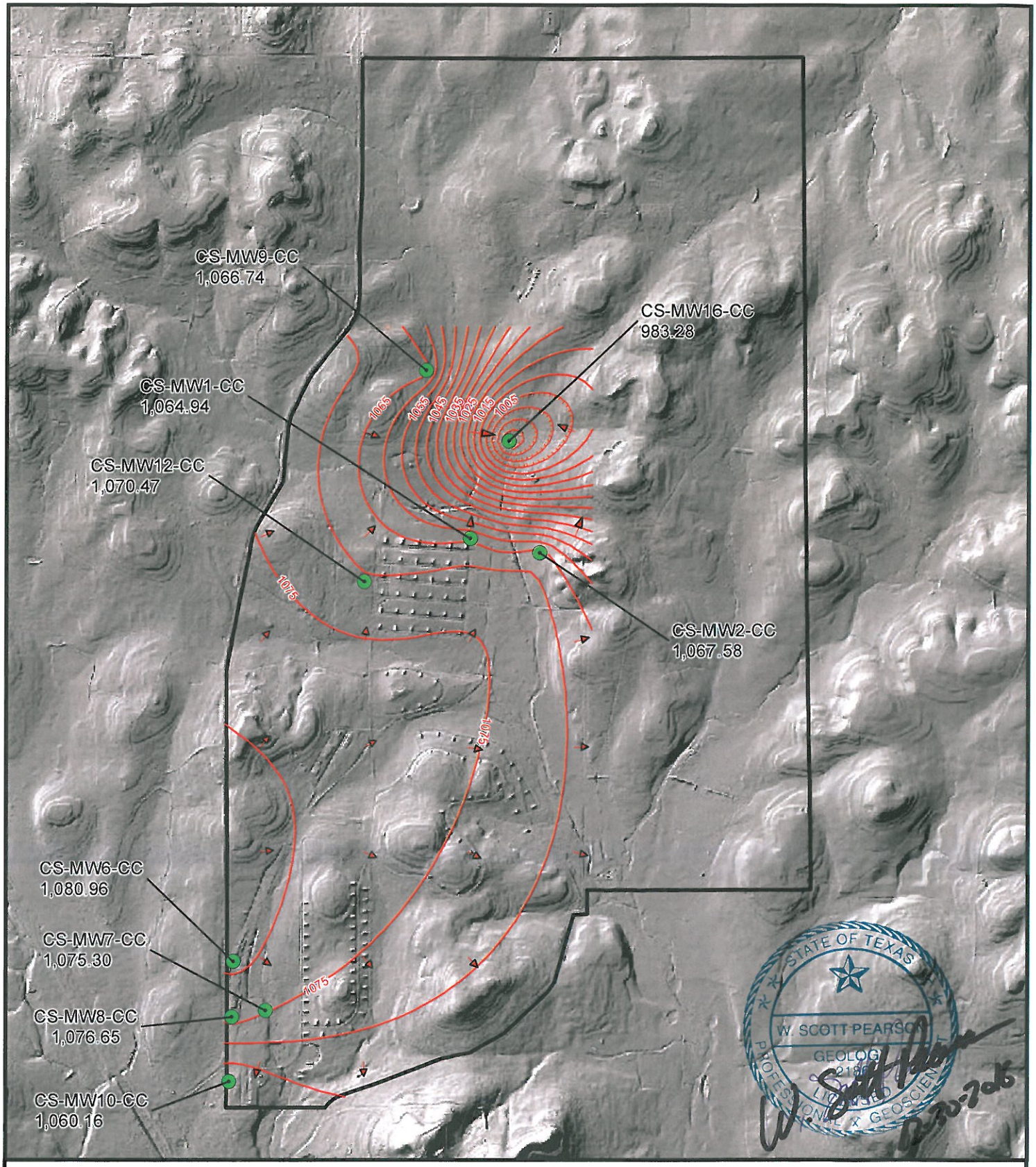


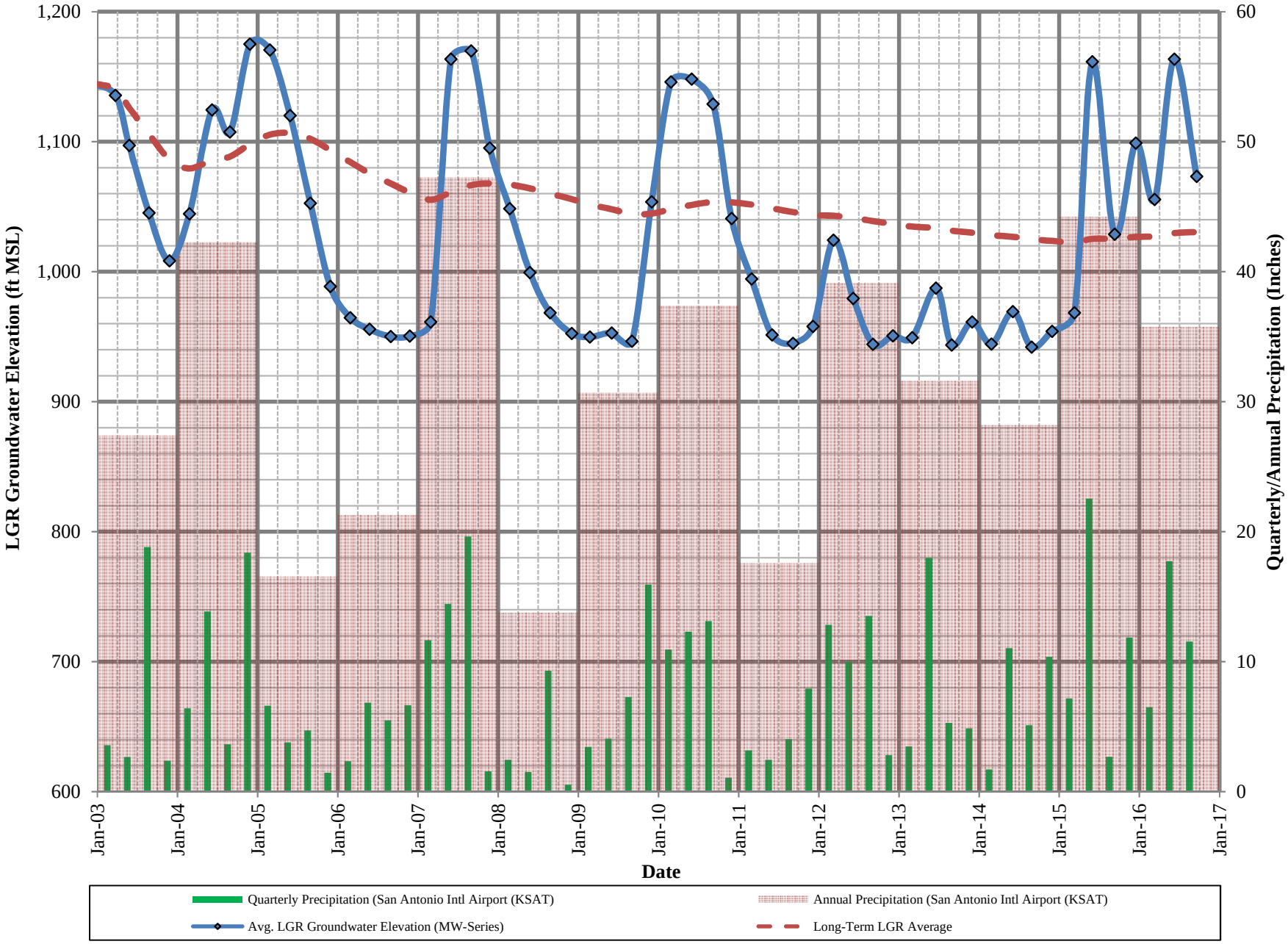
Figure 2.3

September 2016 Potentiometric Surface Map, CC Wells

Camp Stanley Storage Activity

PARSONS

Figure 2.4 - Average LGR Groundwater Elevations and Quarterly/Annual Precipitation



J:\CSSA Program\Restoration\Groundwater\Surfer GW Files\Cumulative GW Map Elevations2.xls

AVG LGR Chart

It should be noted that well pumping on and around CSSA affects the potentiometric surface. On-post wells CS-MW16-LGR, CS-MW16-CC, B3-EXW01, B3-EXW02, B3-EXW03, B3-EXW04, and B3-EXW05 are cyclically pumped as part of the Bioreactor remediation system at Solid Waste Management Unit (SWMU) B-3. These remediation wells provide groundwater to the Bioreactor system, and are automatically operated based upon water level within each well and availability within the storage tanks. Influences from the pumping of the Bioreactor wells B3-EXW01 through B3-EXW05 are manifested as "cones of depression" in **Figure 2.1**. The Bioreactor cone of depression is induced into the aquifer to extract contaminated water within its direct zone of influence, and otherwise retard the flow of the groundwater that cannot be directly captured by the extraction wells away from the site.

CSSA drinking water wells CS-1, CS-10, and CS-12 are also cycled on and off to maintain the drinking water system currently in place at CSSA. Off-post water supply wells along Ralph Fair Road may also exert a subtle influence to gradients along the western and southern boundaries of the post. In fact, the northern end of CSSA exhibits a southwesterly gradient from well CS-I towards CS-12. In the central portion of CSSA, a westerly gradient is evident between the groundwater mound at CS-MW4-LGR and supply well CS-10. In the southern end of the base, the typical south-southeasterly groundwater gradient is evident.

Historical groundwater monitoring at CSSA has demonstrated that the aquifer gradient typically slopes in a south-southeast direction; however, variable aquifer levels and well-pumping scenarios can affect the localized and regional gradients (**Figure 2.1**). In particular, pumping action at wells CS-1, CS-10, CS-MW16-LGR/CC, B3-EXW01 through B3-EXW05, CS-MWH-LGR, CS-I, and even off-post wells (Fair Oaks Ranch) can significantly alter the LGR groundwater gradient. Normally, the regional gradient calculation, an overall groundwater gradient averaged across CSSA, is measured from CS-MWH-LGR to CS-MW21-LGR (0.000119 ft/ft). However because of the groundwater trough between CS-12 and the Bioreactor, this typical flow is interrupted in June 2016. North Pasture groundwater from CS-I flows towards CS-12 at a gradient of 0.0024 ft/ft. Localized gradients of 0.0152 ft/ft to the west were measured between CS-MW4-LGR and CS-10. A south-southeasterly gradient of 0.0088 ft/ft was present between CS-MW21-LGR and CS-1 at the southern end of the camp.

Under normal conditions, the potentiometric surface in both the BS and CC members of the aquifer generally trend in a southerly direction, like the LGR. But during periods of above-average water levels or intense aquifer recharge, a strongly dominant eastward component in both the BS and CC is often observed (**Figures 2.2 and 2.3**). The BS potentiometric surface has a distinctly easterly gradient towards CS-MW1-BS (**Figure 2.2**), with an average groundwater elevation of 1,093.95 feet MSL. Likewise, the CC potentiometric surface has an easterly gradient with an average elevation of 1,060.68 feet MSL.

A review of historical data has shown that the CC potentiometric surface develops a predominantly easterly gradient when the average CC groundwater elevation is higher than 995 feet MSL. Below that elevation, the gradient resumes a more southerly direction. Notable for September 2016 is the well-developed cone of depression around the Bioreactor extraction well, CS-MW16-CC. That well is used for continuous groundwater extraction for the SWMU B-3 Bioreactor system. Similar groundwater conditions were last seen during the September and December 2015 events, where the CC aquifer also showed a predominantly east-southeasterly

flow gradient which is interrupted by a well-developed cone of depression around well CS-MW16-CC.

Groundwater elevations have been measured and recorded since 1992. Previous droughts resulted in water levels decreasing substantially in 1996, 1999, 2000, 2006, 2008, 2009, 2011 through 2014. In 2015, approximately 44 inches of rainfall in the San Antonio area ended the drought cycle, resulting in a net gain of 145 feet in aquifer level over the course of the year. Through September 2016, approximately 36 inches of rainfall has been realized in the San Antonio area. By the end of September 2016, the postwide average level in the LGR wells decreased approximately 80 feet from June 2016. With this decrease, the September 2016 LGR groundwater average elevation (1,073.95 feet MSL) is now 43 feet above the long-term (13.75 year) average groundwater elevation (1,030.51 feet MSL).

It is worth noting that, based on more than 13 years of program history, the postwide LGR groundwater level has declined by 115 feet (see **Figure 2.4**). As can be expected with sparse data sets, the largest rate of change/decline (90 feet) came during the initial 4 years of the groundwater monitoring program. Over the past 9 years, the average decline rate has subdued, losing an additional 30 feet of average groundwater elevation over 7 years of prolonged drought (with the exception of 2010). The past 13.75 year history of CSSA groundwater monitoring indicates that the aquifer level is "below average" approximately 66 percent of the time. However, the past five monitoring events (June, September, December 2015 and March, June, September 2016) have shown above-average aquifer levels. Above average groundwater elevations have been recorded only ten times in the past 28 monitoring events (7 years). Prior to June 2015, the LGR had not been above the long-term "average" water elevation since September 2010.

3.0 SEPTEMBER ANALYTICAL RESULTS

3.1 Monitoring Wells

Under the provisions of the groundwater monitoring DQOs and the 2015 LTMO evaluation, the schedule for sampling on-post in September 2016 included 31 wells. The samples included three production wells (CS-1, CS-10, and CS-12), one future production well (CS-13), and twenty-seven on-post monitoring wells (see **Table 3.1)**. In conjunction with the off-post monitoring initiative (under a separate report) the September 2016 groundwater sampling constituted a "transition" event in which selected wells were sampled to align data needs with the updated LTMO schedule, set to be implemented in December 2016.

All wells scheduled for monitoring in September 2016 were sampled. Additional samples were collected as part of the AOC-65 in-situ chemical oxidation (ISCO) Treatability Study; these results will be reported in a separate treatability study report. **Tables 3.1** and **3.2** provide a sampling overview for September 2016 and the schedule under the LTMO recommendations. The wells listed in **Table 3.1** were sampled using a dedicated low-flow gas-operated bladder pump. Wells CS-1, CS-10, CS-12, and CS-13 were sampled using dedicated electric submersible pumps. **Figure 3.1** shows well sampling locations.

Wells sampled by low-flow pumps were purged until the field parameters of pH, temperature, and conductivity stabilized. The on-post monitoring wells were sampled in September 2016 for volatile organic compounds (VOCs) analytes which include *cis*-1,2-dichloroethene (*cis*-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride). Effective in September 2016 per the recently-approved DQOs, metals are no longer obtained from on-post monitoring wells. Metals analyses will continue to be collected from active groundwater remediation sites (AOC-65 and B-3), as well as on-post drinking water wells. As such, active and future drinking water wells CS-1, CS-10, CS-12, and CS-13 were analyzed for the same VOC analytes and metals (arsenic, barium, chromium, copper, zinc, cadmium, mercury, and lead).

Samples were analyzed by Agriculture & Priority Pollutant Laboratories (APPL) in Clovis, California. All detected concentrations of VOCs and metals are presented in **Table 3.3**. Full analytical results are presented in **Appendix B**.

PCE and/or TCE was detected above the Maximum Contaminant Level (MCL) of 5 micrograms per liter (µg/L) in four on-post wells sampled this quarter: CS-D, CS-MW1-LGR, CS-MW5-LGR, and CS-MW36-LGR. A comparison of VOC concentrations versus water level for select wells is presented in **Figure 3.2**. The overall trend for CS-D, CS-4, CS-MW1-LGR, CS-MW5-LGR, CS-MW36-LGR sampled in September 2016 was a decrease in VOC concentrations with a decrease in groundwater elevation. CS-MW5-LGR has been sampled since 2001, but it has just recently (December 2015) shown concentrations of PCE and TCE above the MCL.

Table 3.1
Overview of the On-Post Monitoring Program

Count	Well ID	*Analytes*	*Last Sample Date*	*Dec-15 (18 mo. snapshot)*	*Mar-16*	*Jun-16*	*Sep-16 (transition event)*	*Sampling Frequency**
1	CS-MW1-LGR	VOCs	Dec-15	S	NS	NS	S	15 months
	CS-MW1-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW1-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
2	CS-MW2-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
	CS-MW2-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
3	CS-MW3-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
4	CS-MW4-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
5	CS-MW5-LGR	VOCs	Jun-16	S	S	S	S	15 months
6/ISCO	CS-MW6-LGR	VOCs	Dec-15	S	NS	NS	S	15 months GW / Qtrly ISCO
	CS-MW6-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW6-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
7/ISCO	CS-MW7-LGR	VOCs	Dec-15	S	NS	NS	S	15 months GW / Qtrly ISCO
	CS-MW7-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
8/ISCO	CS-MW8-LGR	VOCs	Dec-15	S	NS	NS	S	15 months GW / Qtrly ISCO
	CS-MW8-CC	VOCs	Dec-15	S	NS	NS	NS	15 months
9	CS-MW9-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
	CS-MW9-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW9-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
10	CS-MW10-LGR	VOCs	Dec-15	S	NS	NS	S	15 months
	CS-MW10-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
11	CS-MW11A-LGR	VOCs	Dec-15	S	NS	NS	S	15 months
12	CS-MW11B-LGR	VOCs	Dec-15	S	NS	NS	S	15 months
13	CS-MW12-LGR	VOCs	Dec-15	S	NS	NS	S	15 months
	CS-MW12-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW12-CC	VOCs	Dec-15	S	NS	NS	NS	30 months
14	CW-MW17-LGR	VOCs	Dec-15	S	NS	NS	S	15 months
15	CS-MW18-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
16	CS-MW19-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
17	CS-1	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Jun-16	S	S	S	S	Quarterly
18	CS-2	VOCs	Dec-15	S	NS	NS	S	30 months
19	CS-4	VOCs	Dec-15	S	NS	NS	S	15 months
20	CS-10	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Jun-16	S	S	S	S	Quarterly
21	CS-12	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Jun-16	S	S	S	S	Quarterly
22	CS-13	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Jun-16	S	S	S	S	Quarterly
23	CS-D	VOCs	Dec-15	S	NS	NS	S	15 months GW / Qtrly B3
	CS-MWG-LGR	VOCs	Dec-15	S	NS	NS	NS	30 months
	CS-MWH-LGR	VOCs	Dec-15	S	NS	NS	NS	30 months
	CS-I	VOCs	Dec-15	S	NS	NS	NS	30 months
24	CS-MW20-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
25	CS-MW21-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
26	CS-MW22-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
27	CS-MW23-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
28	CS-MW24-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
29	CS-MW25-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
30	CS-MW35-LGR	VOCs	Dec-15	S	NS	NS	S	30 months
31/ISCO	CS-MW36-LGR	VOCs	Jun-16	S	S	S	S	15 months GW / Qtrly ISCO

* New LTMO sampling frequency to be implemented in December
S = Sample
NS = No Sample
NSWL = No Sample due to low water level
ISCO = well sampled as part of treatability study

Table 3.2 Westbay Sampling Frequency

Westbay Interval	Last Sample Date	Dec-15 (snapshot)	Mar-16	Jun-16 (9 month)	Sep-16 (transition event)	LTMO Sampling Frequency (as of Dec. 2016)
CS-WB01-UGR-01	Dec-04	NS	NS	NSWL	S	15 months GW/Qtrly ISCO
CS-WB01-LGR-01	Jun-16	NS	NS	S	S	15 months GW/Qtrly ISCO
CS-WB01-LGR-02	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-03	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-04	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-05	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-06	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-07	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-08	Jun-16	NS	NS	S	S	15 months
CS-WB01-LGR-09	Jun-16	S	NS	S	S	15 months GW/Qtrly ISCO
CS-WB02-UGR-01	Dec-04	NS	NS	NSWL	S	15 months GW/Qtrly ISCO
CS-WB02-LGR-01	Dec-14	NS	NS	NSWL	S	15 months GW/Qtrly ISCO
CS-WB02-LGR-02	Mar-10	NS	NS	NSWL	S	15 months
CS-WB02-LGR-03	Jun-16	NS	NS	S	S	15 months
CS-WB02-LGR-04	Jun-16	NS	NS	S	S	15 months
CS-WB02-LGR-05	Jun-16	NS	NS	S	S	15 months
CS-WB02-LGR-06	Jun-16	NS	NS	S	S	15 months
CS-WB02-LGR-07	Jun-16	NS	NS	S	S	15 months
CS-WB02-LGR-08	Jun-16	NS	NS	S	S	15 months
CS-WB02-LGR-09	Jun-16	S	NS	S	S	15 months GW/Qtrly ISCO
CS-WB03-UGR-01	Jun-16	NS	NS	S	S	15 months GW/Qtrly ISCO
CS-WB03-LGR-01	Jun-16	NS	NS	S	S	15 months GW/Qtrly ISCO
CS-WB03-LGR-02	Oct-07	NS	NS	NSWL	S	15 months
CS-WB03-LGR-03	Jun-16	NS	NS	S	S	15 months
CS-WB03-LGR-04	Jun-16	NS	NS	S	S	15 months
CS-WB03-LGR-05	Jun-16	NS	NS	S	S	15 months
CS-WB03-LGR-06	Jun-16	NS	NS	S	S	15 months
CS-WB03-LGR-07	Jun-16	NS	NS	S	S	15 months
CS-WB03-LGR-08	Jun-16	NS	NS	S	S	15 months
CS-WB03-LGR-09	Jun-16	S	NS	S	S	15 months GW/Qtrly ISCO
CS-WB04-UGR-01	Mar-04	NS	NS	NSWL	NSWL	15 months GW/Qtrly ISCO
CS-WB04-LGR-01	Sep-15	NS	NS	NS	S	15 months GW/Qtrly ISCO
CS-WB04-LGR-02	Mar-14	NS	NS	NS	NS	15 months
CS-WB04-LGR-03	Sep-15	NS	NS	NS	NS	15 months
CS-WB04-LGR-04	Sep-15	NS	NS	NS	NS	15 months
CS-WB04-LGR-06	Jun-16	S	NS	S	S	15 months
CS-WB04-LGR-07	Jun-16	S	NS	S	S	15 months
CS-WB04-LGR-08	Jun-16	NS	NS	S	S	15 months
CS-WB04-LGR-09	Jun-16	S	NS	S	S	15 months
CS-WB04-LGR-10	Jun-16	S	NS	S	S	15 months
CS-WB04-LGR-11	Jun-16	S	NS	S	S	15 months GW/Qtrly ISCO
CS-WB04-BS-01	Sep-15	NS	NS	NS	NS	30 months
CS-WB04-BS-02	Sep-15	NS	NS	NS	NS	30 months
CS-WB04-CC-01	Sep-15	NS	NS	NS	NS	30 months
CS-WB04-CC-02	Sep-15	NS	NS	NS	NS	30 months
CS-WB04-CC-03	Sep-15	NS	NS	NS	NS	30 months

Profiling performed quarterly, in conjunction with post wide water levels.

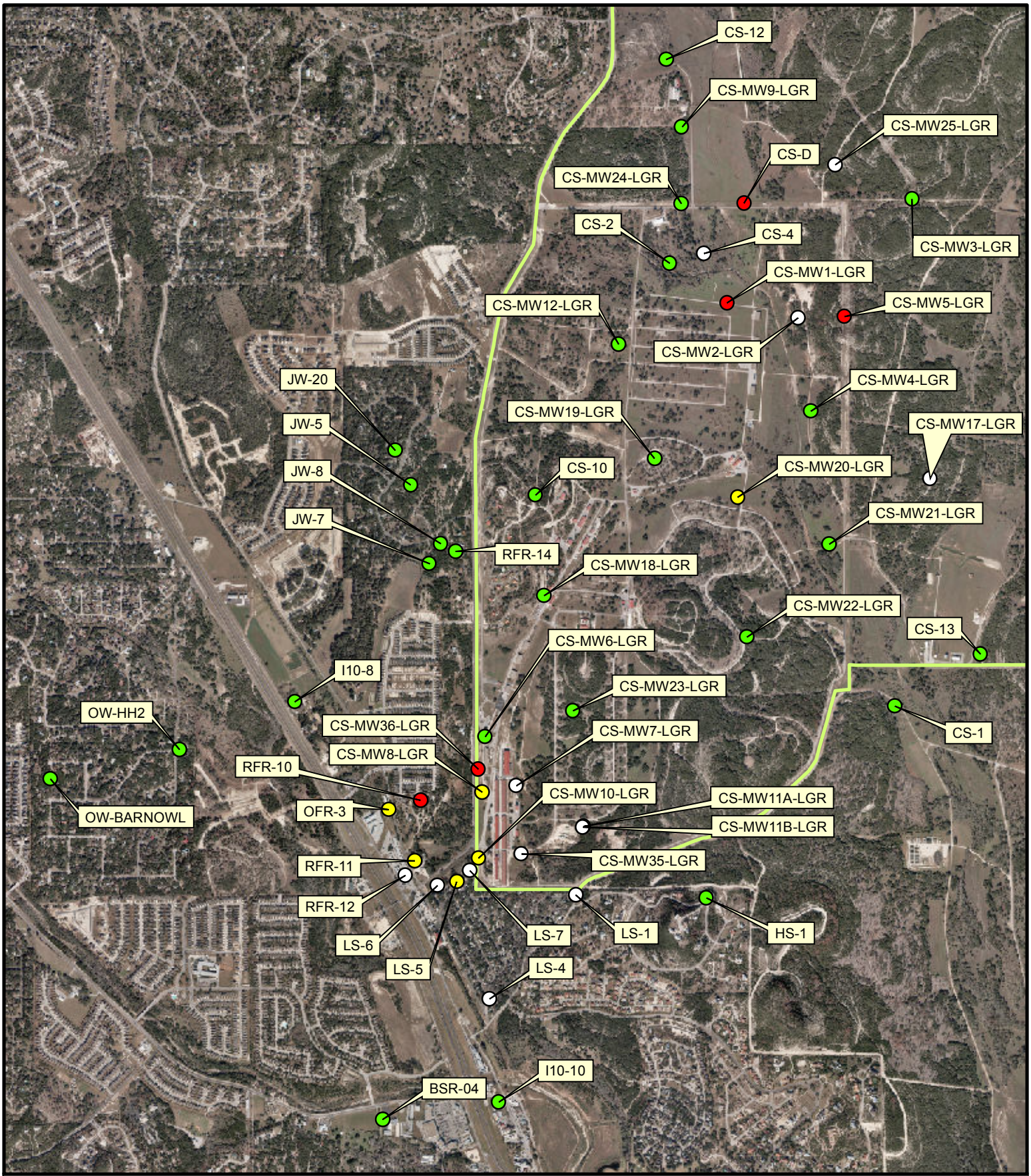


Figure 3.1

On-Post and Off-Post Well Sampling Locations for September 2016

Camp Stanley Storage Activity

PARSONS

Table 3.3
Quarterly On-Post Groundwater Monitoring Analytical Results, September 2016

Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
CS-D	9/22/2016	**12.71**	**13.14**	**18.9**	--
CS-2	9/9/2016	--	--	--	--
CS-4	9/9/2016	--	**0.68F**	**0.64F**	--
CS-4 FD	9/9/2016	**0.09F**	**0.66F**	**0.57F**	--
CS-MW1-LGR	9/21/2016	**24.14**	**15.1**	**24.46**	--
CS-MW2-LGR	9/9/2016	**0.49F**	--	--	--
CS-MW3-LGR	9/13/2016	--	--	--	--
CS-MW4-LGR	9/9/2016	--	--	--	--
CS-MW5-LGR	9/9/2016	**10.89**	**5.2**	**12.32**	--
CS-MW6-LGR	9/12/2016	--	--	--	--
CS-MW7-LGR	9/12/2016	--	**0.72F**	--	--
CS-MW8-LGR	9/12/2016	--	**2.66**	--	--
CS-MW9-LGR	9/13/2016	--	--	--	--
CS-MW10-LGR	9/12/2016	--	**2.02**	**0.41F**	--
CS-MW11A-LGR	9/12/2016	--	**0.56F**	--	--
CS-MW11A-LGR FD	9/12/2016	--	**0.60F**	--	--
CS-MW11B-LGR	9/13/2016	--	**0.90F**	--	--
CS-MW12-LGR	9/8/2016	--	--	--	--
CS-MW17-LGR	9/21/2016	--	**0.74F**	--	--
CS-MW18-LGR	9/9/2016	--	--	--	--
CS-MW19-LGR	9/8/2016	--	--	--	--
CS-MW20-LGR	9/13/2016	--	**1.47**	--	--
CS-MW21-LGR	9/13/2016	--	--	--	--
CS-MW22-LGR	9/13/2016	--	--	--	--
CS-MW23-LGR	9/13/2016	--	--	--	--
CS-MW24-LGR	9/14/2016	--	--	--	--
CS-MW25-LGR	9/13/2016	--	**0.07F**	--	--
CS-MW35-LGR	9/12/2016	--	**0.96F**	--	--
CS-MW36-LGR	9/12/2016	--	**5.35**	**2.35**	--
CSSA Drinking Water Well System					
CS-1	9/27/2016	--	--	--	--
CS-10	9/27/2016	--	--	--	--
CS-10 FD	9/27/2016	--	--	--	--
CS-12	9/27/2016	--	--	--	--
CS-13	10/3/2016	--	--	--	--
Comparison Criteria					
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**

Well ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Zinc	Mercury
CSSA Drinking Water Well System									
CS-1	9/27/2016	--	**0.0379**	--	--	**0.008F**	--	**0.392**	--
CS-10	9/27/2016	--	**0.0412**	--	**0.0013F**	**0.015**	--	**0.601**	--
CS-10 FD	9/27/2016	**0.00024F**	**0.0429**	--	--	**0.005F**	--	**0.522**	--
CS-12	9/27/2016	**0.00160F**	**0.031**	--	**0.0013F**	**0.006F**	--	**0.047F**	--
CS-13	10/3/2016	**0.00508F**	**0.0321**	--	**0.0015F**	--	**0.0027F**	**0.227**	--
Comparison Criteria									
Method Detection Limit (MDL)		**0.00022**	**0.0003**	**0.0005**	**0.001**	**0.003**	**0.0019**	**0.008**	**0.0001**
Reporting Limit (RL)		**0.03**	**0.005**	**0.007**	**0.01**	**0.01**	**0.025**	**0.05**	**0.001**
Max. Contaminant Level (MCL)		**0.01**	**2**	**0.005**	**0.1**	**AL=1.3**	**AL=0.015**	**SS=5.0**	**0.002**

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

Precipitation per Quarter:	**Mar-16**	**Jun-16**	**16-Sep**
AOC-65 Weather Station (AOC-65 WS):	3.57	19.7	15.57
B-3 Weather Station (B-3 WS):	5.66	NA	15.88

All samples were analyzed by APPL, Inc.
VOC data reported in ug/L & metals data reported in mg/L.

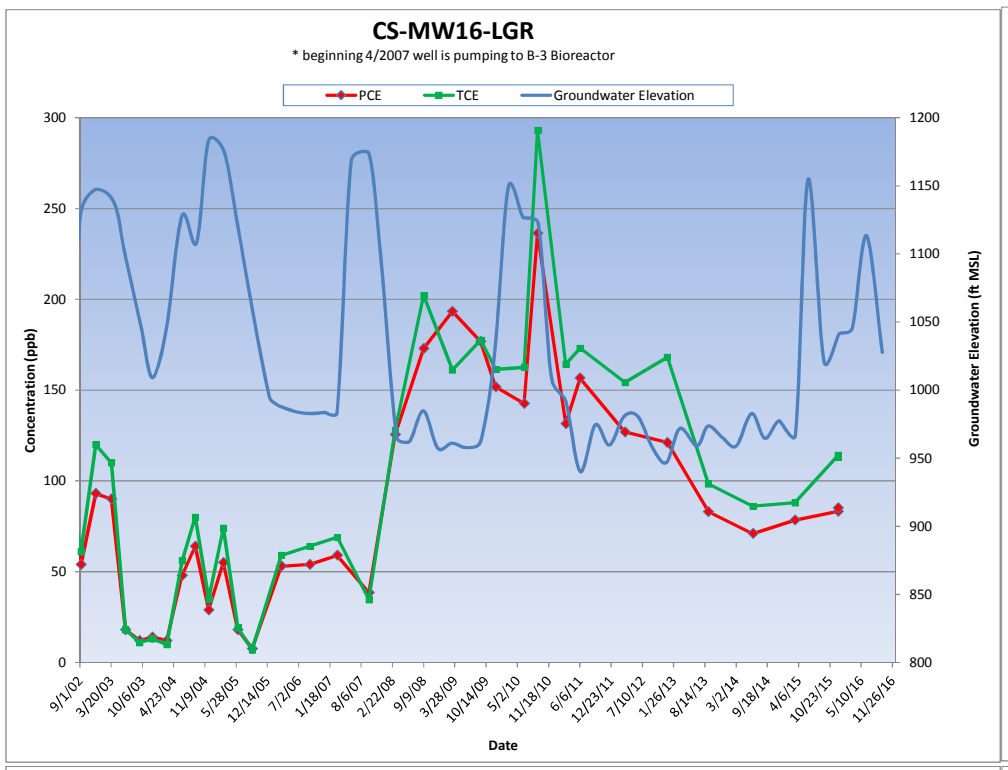
Abbreviations/Notes:

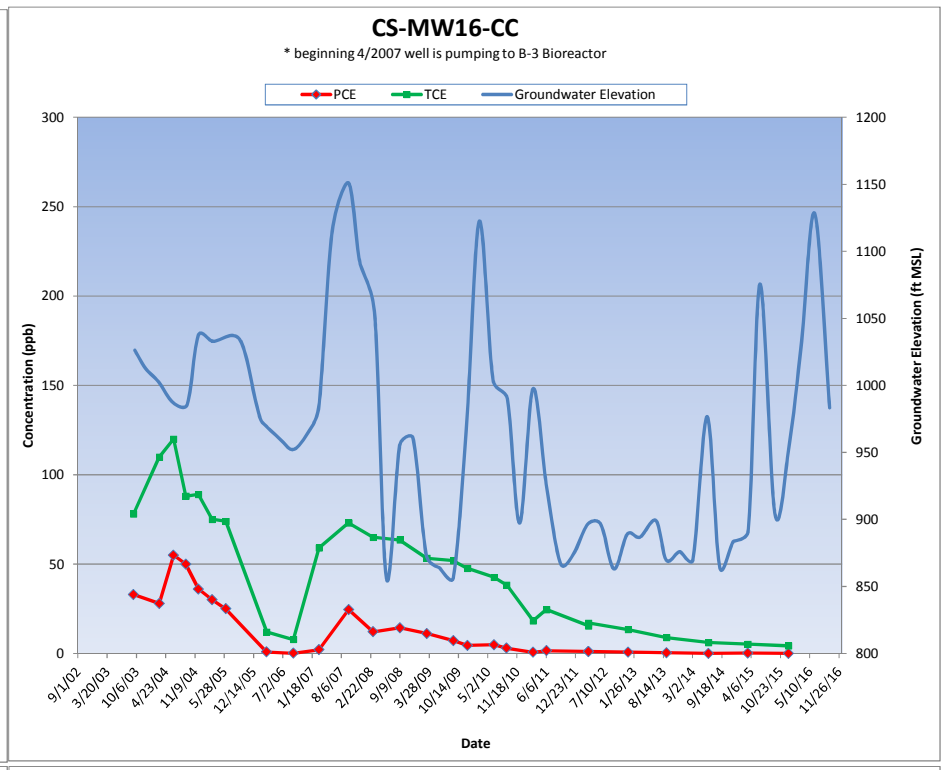
FD	Field Duplicate
TCE	Trichloroethene
PCE	Tetrachloroethene
DCE	Dichloroethene
AL	Action Level
SS	Secondary Standard
NA	Not Analyzed for this parameter

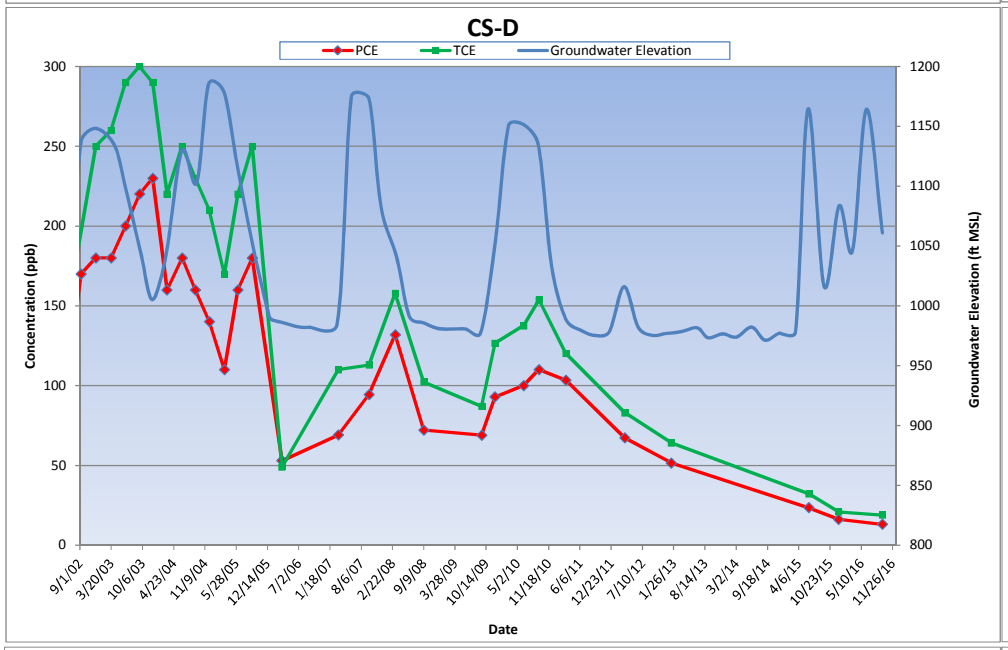
Data Qualifiers:

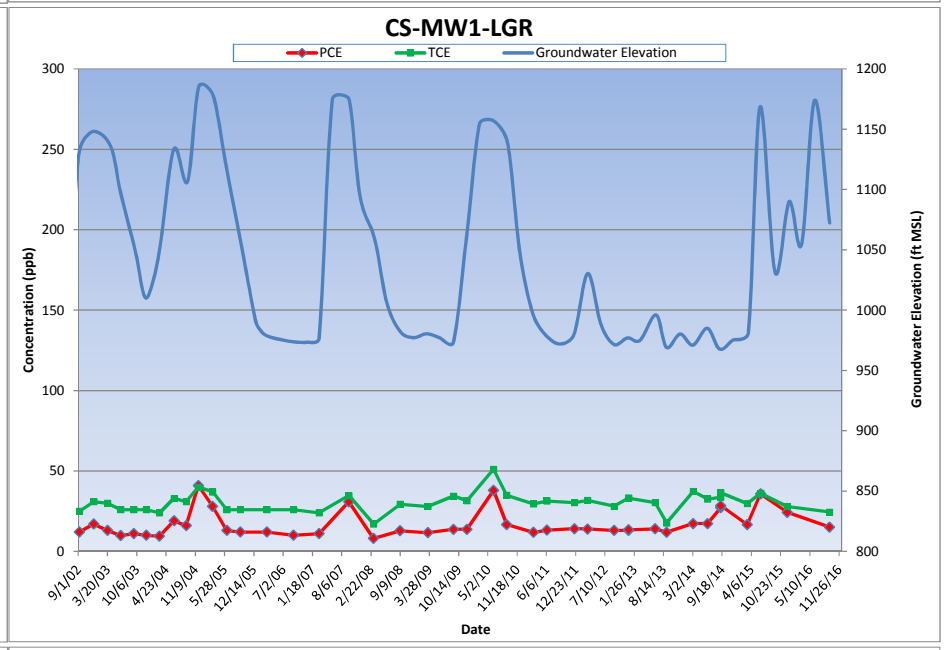
--The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
F-The analyte was positively identified but the associated numerical value is below the RL.

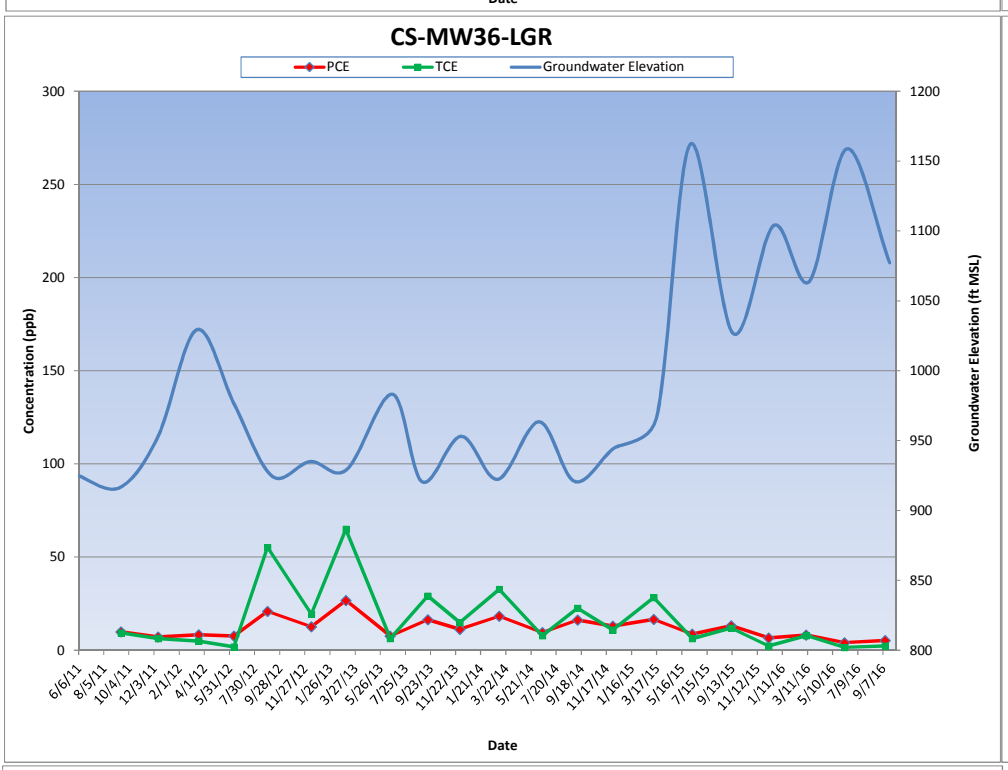
Figure 3.2
On-Post Cumulative Analytical vs. Groundwater Elevation

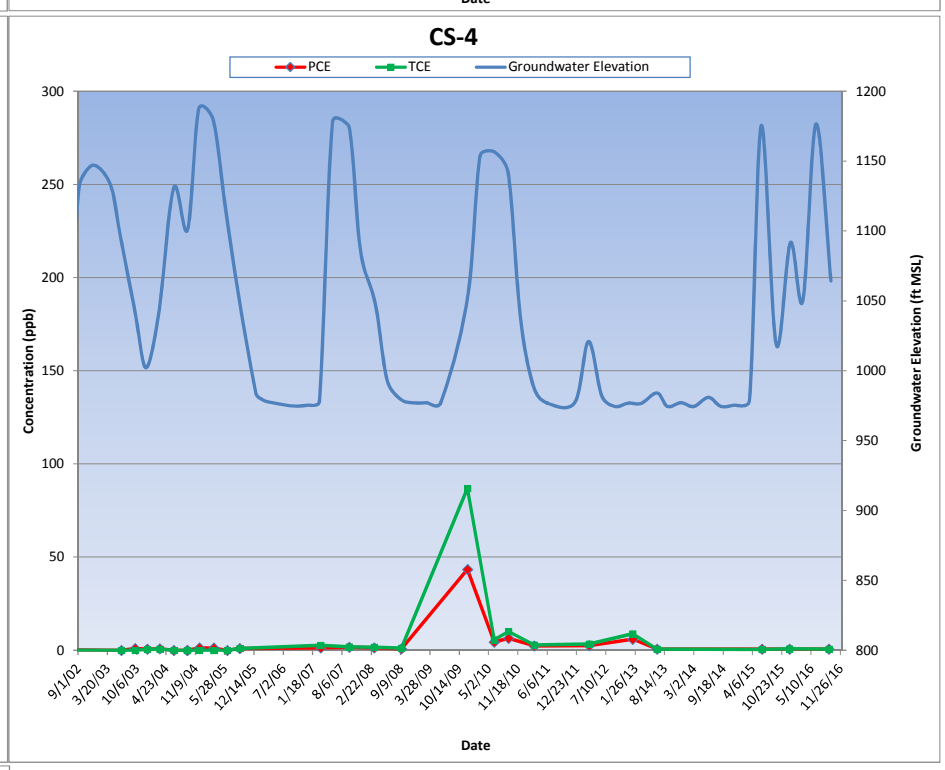


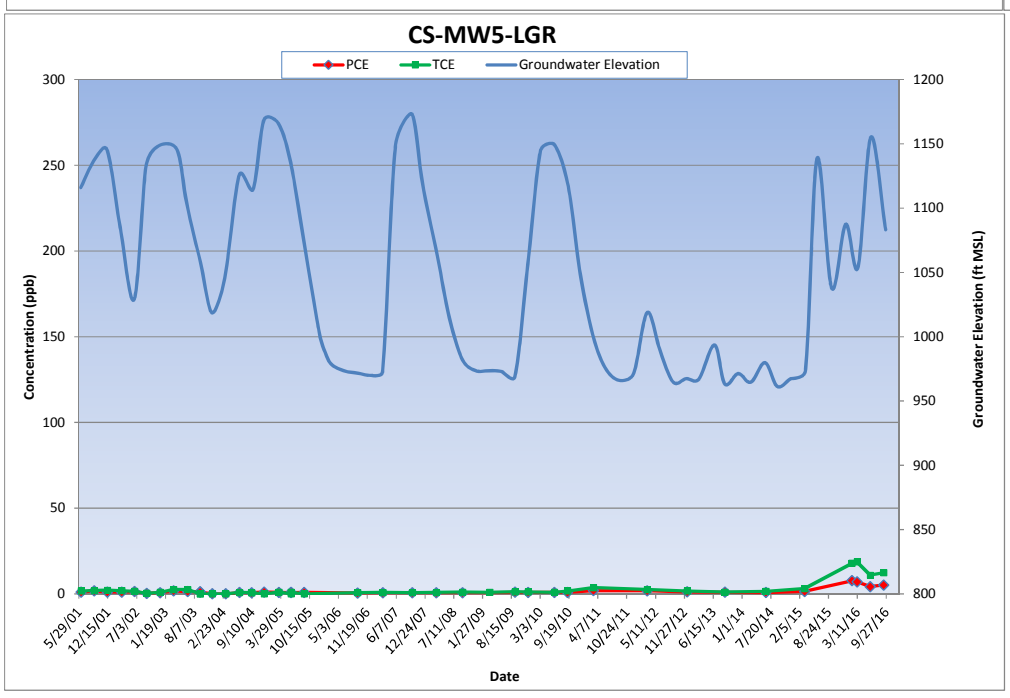












NOTE: Sampling dates are indicated by the squares on the trend line.

Results from on-post monitoring wells are considered definitive data and are subject to data validation and verification under provisions of the CSSA Quality Assurance Project Plan (QAPP). Parsons data packages numbered 110046-#27, -#29, -#30, -#34, -#38 and -#41 containing the analytical results from this sampling event, were received by Parsons September 29 through October 26, 2016. Data validation was conducted and the data validation reports are presented in **Appendix D**.

3.2 Westbay-equipped Wells

The recently updated LTMO schedule is slated to be implemented in December 2016. In September 2016 a transition schedule was applied to prevent large data gaps prior to the execution of the new schedule. This included 38 zones **(Table 3.2)** at AOC-65 Westbay wells (CS-WB01, CS-WB02, CS-WB03, and CS-WB04) scheduled for sampling in September 2016. These wells were also profiled to capture water level readings. These Westbay wells are located in the vicinity of AOC-65, and are part of the post-wide quarterly groundwater monitoring program. Per the recently-approved 2015 LTMO, the Upper Glen Rose (UGR)/LGR zones are to be sampled on a 15-month schedule and the BS/CC zones are sampled on a 30-month schedule. The sampling of these wells began in September 2003.

Of the 38 zones scheduled for sampling in September 2016, 32 samples were obtained. Six zones were not collected. CS-WB01-UGR-01, CS-WB02-LGR-01, CS-WB02-LGR-02, CS-WB03-LGR-02, CS-WB04-UGR-01 were dry and the sample port to CS-WB02-UGR-01 is clogged with silt. (**Table 3.4**). A total of 28 zones had detections of either *cis*-1,2-DCE, PCE, TCE, and/or vinyl chloride above their respective reporting limits (RL). Thirteen of those zones were also in excess of the MCLs for either PCE and/or TCE. Vinyl chloride was reported in zone CS-WB03-LGR-08.

Nine of 10 zones in CS-WB01 were sampled in September 2016. The uppermost zone CS-WB01-UGR-01 was dry. The PCE and TCE levels in zone –LGR-03, which reported its highest detection to date in June 2016, showed a decreasing trend. Zones –LGR-05, -LGR-06, and –LGR-08 had concentrations of *cis*-1,2-DCE at a historic high level since these wells were first sampled in September 2003. Zone –LGR-06 also had a peak concentration of TCE which has been increasing since 2011.

All but the upper three zones were sampled in CS-WB02 in September 2016. The upper UGR zone has been filled with silt and the sampling port is clogged. The –LGR-01 and –LGR-02 zones were dry. Zone –LGR-05 showed its third and highest detection of *cis*-1,2-DCE. Zone –LGR-08 showed a peak detection of *cis*-1,2-DCE, which has been increasing since March 2010. Zones –LGR-04 and –LGR-09 have concentrations of PCE and/or TCE above the MCL.

All zones in CS-WB03, with the exception of –LGR-02 which was dry, were sampled in September 2016. Overall the PCE and TCE concentrations have decreased in this well. Zones –LGR-04 and -LGR-06 reported their highest concentrations of *cis*-1,2-DCE to date, (still below the MCL). Zone –LGR-08 had its forth and highest detection of vinyl chloride to date.

Table 3.4
September 2016 Westbay Quarterly Results, Detected Analytes

Well ID	Date Sampled	cis-1,2-DCE (cis-1,2-dichloroethene)	TCE (trichloroethene)	PCE (tetrachloroethene)	Vinyl Chloride
CS-WB01-UGR-01	9/14/2016	Dry			
CS-WB01-LGR-01	9/14/2016	--	**0.53F**	**0.93F**	--
CS-WB01-LGR-02	9/14/2016	--	**2.46**	**11.55**	--
CS-WB01-LGR-03	9/14/2016	--	**12.67**	**4.26**	--
CS-WB01-LGR-04	9/14/2016	**0.49F**	--	--	--
CS-WB01-LGR-05	9/14/2016	**0.60F**	**1.36**	--	--
CS-WB01-LGR-06	9/14/2016	**2.10**	**3.11**	--	--
CS-WB01-LGR-07	9/14/2016	**0.23F**	**13.99**	**13.07**	--
CS-WB01-LGR-08	9/14/2016	**20.78**	**2.81**	--	--
CS-WB01-LGR-09	9/14/2016	**0.49F**	**10.89**	**7.95**	--
CS-WB02-UGR-01	9/15/2016	port clogged			
CS-WB02-LGR-01	9/15/2016	dry			
CS-WB02-LGR-02	9/15/2016	dry			
CS-WB02-LGR-03	9/15/2016	--	--	**2.35**	--
CS-WB02-LGR-04	9/15/2016	--	**5.04**	**2.8**	--
CS-WB02-LGR-05	9/15/2016	**0.28F**	**1.79**	--	--
CS-WB02-LGR-06	9/15/2016	--	**1.93**	**3.81**	--
CS-WB02-LGR-07	9/15/2016	**0.40F**	**1.34**	**0.48F**	--
CS-WB02-LGR-08	9/15/2016	**4.28**	--	--	--
CS-WB02-LGR-09	9/15/2016	--	**6.81**	**7.05**	--
CS-WB03-UGR-01	9/19/2016	**16.67**	**129.76*****	**9817.43******	--
CS-WB03-LGR-01	9/19/2016	**0.71F**	**15.75**	**337.86****	--
CS-WB03-LGR-02	9/19/2016	dry			
CS-WB03-LGR-03	9/19/2016	--	**1.21**	**4.47**	--
CS-WB03-LGR-04	9/19/2016	**0.30F**	**5.57**	**15.06**	--
CS-WB03-LGR-05	9/19/2016	--	**2.67**	**15.71**	--
CS-WB03-LGR-06	9/19/2016	**8.87**	--	--	--
CS-WB03-LGR-07	9/19/2016	**3.47**	**10.62**	**2.82**	--
CS-WB03-LGR-08	9/19/2016	**3.14**	**0.41F**	--	**1.14**
CS-WB03-LGR-09	9/19/2016	--	**2.87**	**2.64**	--
CS-WB04-UGR-01	9/20/2016	dry			
CS-WB04-LGR-01	9/20/2016	--	--	**1.11F**	--
CS-WB04-LGR-06	9/20/2016	**5.53**	**18.38**	**12.8**	--
CS-WB04-LGR-07	9/20/2016	**40.9**	**2.15**	**0.40F**	--
CS-WB04-LGR-08	9/20/2016	**0.42F**	**1.29**	**1.41**	--
CS-WB04-LGR-09	9/20/2016	--	**7.84**	**14.72**	--
CS-WB04-LGR-10	9/20/2016	--	**0.57F**	**4.34**	--
CS-WB04-LGR-11	9/20/2016	--	--	**1.41F***	--
Comparison Criteria					
Method Detection Limit	**MDL**	**0.07**	**0.05**	**0.06**	**0.08**
Reporting Limit	**RL**	**1.2**	**1**	**1.4**	**1.1**
Max. Contaminant Level	**MCL**	**70**	**5**	**5**	**2**

Data Qualifiers
'--' indicates the result was non-detect.
F-The analyte was positively identified but the associated numerical value is below the RL.
* dilution of 2 run for this sample.
** dilution of 5 run for this sample.
*** dilution of 50 run for this sample.
**** dilution of 200 run for this sample
All values are reported in µg/L.

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

Seven of the eight zones scheduled for sampling in CS-WB04 were collected in September 2016. The upper zone –UGR-01 was dry. Zone –LGR-07 showed a slight increase in PCE and TCE with a peak detection of *cis*-1,2-DCE. Zone –LGR-08 showed a moderate increase in PCE, TCE, and *cis*-1,2-DCE. Zone –LGR-09 had an increase in PCE and TCE concentrations which fall on the high end of the concentration ranges in this zone. Zones –LGR-06 and –LGR-09 were above the MCL for PCE and TCE in September 2016.

There are four other Westbay wells (CS-WB05, CS-WB06, CS-WB07, and CS-WB08) that are located at the SWMU B-3 remediation site. Those wells are sampled on a separate schedule in association with the SWMU B-3 bioreactor monitoring. Results for those wells are presented in the SWMU B-3 Performance Status Reports.

4.0 SEPTEMBER 2016 SUMMARY

- Groundwater samples were collected from all 31 of the on-post wells scheduled for monitoring in September 2016 at Camp Stanley Storage Activity (CSSA).
- From July 1st to September 30, 2016, CSSA's AOC-65 weather station recorded 15.57 inches of rain while the SWMU B-3 weather station recorded 15.88 inches. The rainfall was patchy with 0.66 (AOC-65) and 0.79 (B-3) inches falling in July, 8.89 (AOC-65) and 8.13 (B-3) inches falling in August, and 6.02 (AOC-65) and 6.96 (B-3) inches in September. Five events had greater than one inch of rain at AOC-65 and four events at B-3.
- The Middle Trinity aquifer levels (LGR, BS, and CC) decreased an average of 85.26 feet per non-pumping well since last quarter. The average water level in September 2016 (excluding pumping wells) was 166.93 feet BTOC (1,074.62 feet MSL).
- VOCs were detected above the MCL in wells CS-D, CS-MW1-LGR, CS-MW5-LGR, and CS-MW36-LGR. The VOC levels in these wells remained relatively the same as the previous sampling event **(see Figure 3.2)**.
- With the approval of the 2015 DQOs by the regulatory agencies, metals samples are no longer collected from on-post monitoring wells for routine groundwater monitoring. However, the 2015 DQOs do prescribe metals sampling at the public water supply wells, and in support of active remediation actions at AOC-65 and B-3. This September 2016 sampling event initiates the new DQOs, and therefore metals samples were not obtained from monitoring wells. There were no metals detected above the MCL/AL/SS in the public supply wells sampled in September 2016.
- Of the 38 Westbay multi-port zones scheduled for sampling in September 2016, 32 samples were obtained. Six zones were not collected. Zones CS-WB01-UGR-01, CS-WB02-LGR-01, CS-WB02-LGR-02, CS-WB03-LGR-02, and CS-WB04-UGR-01 were dry and the sample port to CS-WB02-UGR-01 is clogged with silt. (**Table 3.4**). A total of 28 zones had detections of either *cis*-1,2-DCE, PCE, TCE, or vinyl chloride above their respective RLs. Thirteen of those zones were also in excess of the MCLs for either PCE and/or TCE.
- The updated groundwater project DQOs and LTMO have been approved by the TCEQ April 22, 2016 and EPA May 5, 2016. The new LTMO will be implemented during the December 2016 groundwater event. This September sampling served as a transition event. Changes will include modifications in the sample collection frequency and analytical parameters in selected wells.

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, HSP, and LTMO recommendations.	All sampling was conducted in accordance with the procedures described in the project plans.	Yes.	NA
Characterization of Environmental Setting (Hydrogeology)	Prepare water-level contour and/or potentiometric maps for each formation of the Middle Trinity Aquifer (3.5.3).	Potentiometric surface maps were prepared based on water levels measured in each of CSSA's wells screened in three formations on September 23, 2016.	To the extent possible with data available. Due to the limited data available and the fact that wells are completed across multiple water-bearing units, potentiometric maps should only be used for regional water flow direction, not local. Ongoing pumping in the CSSA area likely affects the natural groundwater flow direction.	As additional wells are installed screened in distinct formations, future evaluations will eliminate reliance on wells screened across multiple formations.
	Describe the flow system, including the vertical and horizontal components of flow (2.1.9).	Potentiometric maps were created using September 23, 2016 water level data, and horizontal flow direction was tentatively identified. Insufficient data are currently available to determine vertical component of flow.	As described above, due to the lack of aquifer-specific water level information, potentiometric surface maps should only be used as an estimate of regional flow direction.	Same as above.
	Define formation(s) in the Middle Trinity Aquifer are impacted by the VOC contaminants (2.1.3).	Quarterly groundwater monitoring provides information on Middle Trinity Aquifer impacts. Monitoring wells equipped with Westbay® - multi-port samplers are sampled every 15 or 30 months.	Yes.	Continue sampling.

Activity	Objectives	Action	Objective Attained?	Recommendations
Characterization of Environmental Setting (Hydrogeology) (Continued)	Identify any temporal changes in hydraulic gradients due to seasonal influences (2.1.5).	Downloaded data from continuous-reading transducers in wells: CS-MW4-LGR, CS-MW9-LGR, CS-MW12-LGR, CS-MW12-CC, CS-MW10-CC and CS-MW24-LGR. Additional continuous reading transducers were added to the program through the SCADA project. The following wells can be uploaded to see real time water level data: CS-MW16-LGR, CS-MW16-CC, CS-1, CS-12, and CS-10. Data was also downloaded from the AOC-65 and B-3 weather stations. Water levels will be graphed at these wells against precipitation data through December 2016 and included in the annual groundwater report.	Yes.	Continue collection of transducer data and possibly install transducers in other cluster wells.
Contamination Characterization (Ground Water Contamination)	Characterize the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility (3.1.2).	Samples for laboratory analysis were collected from 31 of 49 CSSA on-post monitoring wells. The 4 BS wells are no longer sampled as part of the groundwater program.	The horizontal and vertical extent of groundwater contamination is continuously monitored.	Continue groundwater monitoring and construct additional wells as necessary.
	Determine the horizontal and vertical concentration profiles of all constituents of concern (COC) in the groundwater that are measured by USEPA-approved procedures (3.1.2). COCs are those chemicals that have been detected in groundwater in the past and their daughter (breakdown) products.	Groundwater samples were collected from wells: CS-D, CS-2, CS-4, CS-MW1-LGR, CS-MW2-LGR, CS-MW3-LGR, CS-MW4-LGR, CS-MW5-LGR, CS-MW6-LGR, CS-MW7-LGR, CS-MW8-LGR, CS-MW9-LGR, CS-MW10-LGR, CS-MW11A-LGR, CS-MW11B-LGR, CS-MW12-LGR, CS-MW17-LGR, CS-MW18-LGR, CS-MW19-LGR, CS-MW20-LGR, CS-MW21-LGR, CS-MW22-LGR, CS-MW23-LGR, CS-MW24-LGR, CS-MW25-LGR, CS-MW35-LGR, and CS-MW36-LGR. Samples were analyzed for the short list of VOCs using USEPA method SW8260B. The drinking water wells (CS-1, CS-10, CS-12 and CS-13) were sampled for the short list of VOCs and metals (arsenic, barium, chromium, copper, cadmium, mercury, lead, and zinc). Analyses were conducted in accordance with the CSSA QAPP and approved variances. All reporting limits (RL) were below MCLs, as listed below:	Yes.	Continue sampling.

Activity	Objectives	Action	Objective Attained?	Recommendations
Contamination Characterization (Ground Water Contamination) (Continued)	Determine the horizontal and vertical concentration profiles of all constituents of concern (COC) in the groundwater that are measured by USEPA-approved procedures (3.1.2). COCs are those chemicals that have been detected in groundwater in the past and their daughter (breakdown) products.	**ANALYTE** / **RL (µg /L)** / **MCL(µg/L)** *cis*-1,2-DCE 1.2 70 PCE 1.4 5 TCE 1.0 5 Vinyl chloride 1.1 2	Yes.	Continue sampling.
		ANALYTE / **RL (µg/L)** / **MCL/AL (µg /L)** Barium 5 2,000 Chromium 10 100 Copper 10 1,300 Zinc 50 5,000 Arsenic 30 10 Cadmium 7 5 Lead 25 15 Mercury 1 2	Yes.	Continue sampling.
	Meet CSSA QAPP quality assurance requirements.	Samples were analyzed in accordance with the CSSA QAPP and approved variances. Parsons chemists verified all data.	Yes.	NA
		All data flagged with a "U," "J," "M," and "F" are usable for characterizing contamination. All "R" flagged data are considered unusable.	Yes.	NA

Activity	Objectives	Action	Objective Attained?	Recommendations
Contamination Characterization (Ground Water Contamination) (Continued)	Meet CSSA QAPP quality assurance requirements. (Continued)	Previously, a method detection limit (MDL) study for arsenic, cadmium, and lead was not performed within a year of the analyses, as required by the AFCEE QAPP.	The laboratory performed new MDL studies in February 2001 for these metals and the new MDL values were found to be almost identical to the previous MDLs and all met the associated AFCEE QAPP requirements. MDLs for these three metals are well below MCLs. In addition, the laboratory performed daily calibrations and RL verifications for these metals, both of which demonstrate the laboratory's ability to detect and quantitate these metals at RL levels. These daily analyses also indicate that concentrations above the laboratory RL for these compounds were not affected by the expired MDL study.	Use results for groundwater characterization purposes.
Remediation	Determine goals and create cost-effective and technologically appropriate methods for remediation (2.2.1).	Continued data collection will provide analytical results for accomplishing this objective.	Ongoing.	Continue sampling and evaluation, including quarterly groundwater monitoring teleconferences to address remediation.
	Determine placement of new wells for monitoring (2.3.1, 3.6)	Sampling frequency and sample locations to be monitored (including any new wells) will be based on trend data from monitoring event(s) (3.1.5).	Ongoing.	Continue quarterly groundwater teleconferences to discuss sampling frequency and placement of new monitor wells.
Project schedule/ Reporting	Produce a quarterly monitoring project schedule as a road map for sampling, analysis, validation, verification, reviews, and reports.	Prepare schedules and sampling guidelines prior to each quarterly sampling event.	Yes.	Continue sampling schedule preparation each quarter.

APPENDIX B

QUARTERLY ON-POST GROUNDWATER MONITORING ANALYTICAL RESULTS SEPTEMBER 2016

Appendix B
Quarterly On-Post Groundwater Monitoring Analytical Results, September 2016

Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
CS-D	9/22/2016	**12.71**	**13.14**	**18.9**	0.08U
CS-2	9/9/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-4	9/9/2016	**0.07U**	**0.68F**	**0.64F**	0.08U
CS-4 FD	9/9/2016	**0.09F**	**0.66F**	**0.57F**	0.08U
CS-MW1-LGR	9/21/2016	**24.14**	**15.1**	**24.46**	0.08U
CS-MW2-LGR	9/9/2016	**0.49F**	**0.06U**	**0.05U**	0.08U
CS-MW3-LGR	9/13/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW4-LGR	9/9/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW5-LGR	9/9/2016	**10.89**	**5.2**	**12.32**	0.08U
CS-MW6-LGR	9/12/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW7-LGR	9/12/2016	**0.07U**	**0.72F**	**0.05U**	0.08U
CS-MW8-LGR	9/12/2016	**0.07U**	**2.66**	**0.05U**	0.08U
CS-MW9-LGR	9/13/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW10-LGR	9/12/2016	**0.07U**	**2.02**	**0.41F**	0.08U
CS-MW11A-LGR	9/12/2016	**0.07U**	**0.56F**	**0.05U**	0.08U
CS-MW11A-LGR FD	9/12/2016	**0.07U**	**0.60F**	**0.05U**	0.08U
CS-MW11B-LGR	9/13/2016	**0.07U**	**0.90F**	**0.05U**	0.08U
CS-MW12-LGR	9/8/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW17-LGR	9/21/2016	**0.07U**	**0.74F**	**0.05U**	0.08U
CS-MW18-LGR	9/9/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW19-LGR	9/8/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW20-LGR	9/13/2016	**0.07U**	**1.47**	**0.05U**	0.08U
CS-MW21-LGR	9/13/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW22-LGR	9/13/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW23-LGR	9/13/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW24-LGR	9/14/2016	**0.07U**	**0.06U**	**0.05U**	0.08U
CS-MW25-LGR	9/13/2016	**0.07U**	**0.07F**	**0.05U**	0.08U
CS-MW35-LGR	9/12/2016	**0.07U**	**0.96F**	**0.05U**	0.08U
CS-MW36-LGR	9/12/2016	0.07U	**5.35**	**2.35**	0.08U
CSSA Drinking Water Well System					
CS-1	9/27/2016	0.07U	**0.06U**	0.05U	0.08U
CS-10	9/27/2016	0.07U	**0.06U**	0.05U	0.08U
CS-10 FD	9/27/2016	0.07U	0.06U	0.05U	0.08U
CS-12	9/27/2016	0.07U	**0.06U**	0.05U	0.08U
CS-13	10/3/2016	0.07U	0.06U	0.05U	0.08U

Well ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Zinc	Mercury
CSSA Drinking Water Well System									
CS-1	9/27/2016	0.00022U	**0.0379**	0.0005U	0.001U	**0.008F**	0.0019U	**0.392**	0.0001U
CS-10	9/27/2016	0.00022U	**0.0412**	0.0005U	**0.0013F**	**0.015**	0.0019U	**0.601**	0.0001U
CS-10 FD	9/27/2016	**0.00024F**	**0.0429**	0.0005U	0.001U	**0.005F**	0.0019U	**0.522**	0.0001U
CS-12	9/27/2016	**0.00160F**	**0.031**	0.0005U	**0.0013F**	**0.006F**	0.0019U	**0.047F**	0.0001U
CS-13	10/3/2016	**0.00508F**	**0.0321**	0.0005U	**0.0015F**	0.003U	**0.0027F**	**0.227**	0.0001U

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.
VOC data reported in ug/L & metals data reported in mg/L.

Abbreviations/Notes:

FD	Field Duplicate
TCE	Trichloroethene
PCE	Tetrachloroethene
DCE	Dichloroethene
AL	Action Level
SS	Secondary Standard
NA	Not Analyzed for this parameter

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

Westbay Well Analytical Results, September 2016

Appendix C
Westbay Well Analytical Results, September 2016

Well ID	Date Sampled	cis-1,2-DCE (cis-1,2-dichloroethene)	TCE (trichloroethene)	PCE (tetrachloroethene)	Vinyl Chloride
CS-WB01-LGR-01	9/14/2016	<0.07	**0.53F**	**0.93F**	<0.08
CS-WB01-LGR-02	9/14/2016	<0.07	**2.46**	**11.55**	<0.08
CS-WB01-LGR-03	9/14/2016	<0.07	**12.67**	**4.26**	<0.08
CS-WB01-LGR-04	9/14/2016	**0.49F**	<0.05	<0.06	<0.08
CS-WB01-LGR-05	9/14/2016	**0.60F**	**1.36**	<0.06	<0.08
CS-WB01-LGR-06	9/14/2016	**2.10**	**3.11**	<0.06	<0.08
CS-WB01-LGR-07	9/14/2016	**0.23F**	**13.99**	**13.07**	<0.08
CS-WB01-LGR-08	9/14/2016	**20.78**	**2.81**	<0.06	<0.08
CS-WB01-LGR-09	9/14/2016	**0.49F**	**10.89**	**7.95**	<0.08
CS-WB02-LGR-03	9/15/2016	<0.07	<0.05	**2.35**	<0.08
CS-WB02-LGR-04	9/15/2016	<0.07	**5.04**	**2.8**	<0.08
CS-WB02-LGR-05	9/15/2016	**0.28F**	**1.79**	<0.06	<0.08
CS-WB02-LGR-06	9/15/2016	<0.07	**1.93**	**3.81**	<0.08
CS-WB02-LGR-07	9/15/2016	**0.40F**	**1.34**	**0.48F**	<0.08
CS-WB02-LGR-08	9/15/2016	**4.28**	<0.05	<0.06	<0.08
CS-WB02-LGR-09	9/15/2016	<0.07	**6.81**	**7.05**	<0.08
CS-WB03-UGR-01	9/19/2016	**16.67**	**129.76*** **	**9817.43**** **	<0.08
CS-WB03-LGR-01	9/19/2016	**0.71F**	**15.75**	**337.86** **	<0.08
CS-WB03-LGR-03	9/19/2016	<0.07	**1.21**	**4.47**	<0.08
CS-WB03-LGR-04	9/19/2016	**0.30F**	**5.57**	**15.06**	<0.08
CS-WB03-LGR-05	9/19/2016	<0.07	**2.67**	**15.71**	<0.08
CS-WB03-LGR-06	9/19/2016	**8.87**	<0.05	<0.06	<0.08
CS-WB03-LGR-07	9/19/2016	**3.47**	**10.62**	**2.82**	<0.08
CS-WB03-LGR-08	9/19/2016	**3.14**	**0.41F**	<0.06	**1.14**
CS-WB03-LGR-09	9/19/2016	<0.07	**2.87**	**2.64**	<0.08
CS-WB04-LGR-01	9/20/2016	<0.07	<0.05	**1.11F**	<0.08
CS-WB04-LGR-06	9/20/2016	**5.53**	**18.38**	**12.8**	<0.08
CS-WB04-LGR-07	9/20/2016	**40.9**	**2.15**	**0.40F**	<0.08
CS-WB04-LGR-08	9/20/2016	**0.42F**	**1.29**	**1.41**	<0.08
CS-WB04-LGR-09	9/20/2016	<0.07	**7.84**	**14.72**	<0.08
CS-WB04-LGR-10	9/20/2016	<0.07	**0.57F**	**4.34**	<0.08
CS-WB04-LGR-11	9/20/2016	<0.07	<0.05	**1.41F***	<0.08

Data Qualifiers

F-The analyte was positively identified but the associated numerical value is below the RL.
* dilution of 2 run for this sample.
** dilution of 5 run for this sample.
*** dilution of 50 run for this sample.
**** dilution of 200 run for this sample
All values are reported in µg/L.

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

APPENDIX D

DATA VALIDATION REPORT

SDG 80890
SDG 80905
SDG 90972
SDG 81016
SDG 81066
SDG 81129

DATA VERIFICATION SUMMARY REPORT

for on-post and 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 eight groundwater samples and the associated field quality control (QC) samples collected from on-post and off-post Camp Stanley Storage Activity (CSSA) on September 8. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs).

80890

The field QC samples associated with this SDG were a trip blank (TB), a pair of matrix spike/matrix spike duplicate (MS/MSD), and a set of parent/field duplicate (FD) samples. 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 had temperature of 3.0 ºC upon delivery to the lab. It was within the 2-6ºC 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 twelve (12) groundwater samples which included six (6) off-post wells, two (2) on-post wells, one (1) FD, one (1) set of MS/MSD, and one (1) TB. All samples were collected from September 8, 2016 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 two analytical batches, #211660 and #211879, under two sets 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 two laboratory control spike (LCS) samples, MS/MSD, and the surrogate spikes. Sample OW-BARNOWL was designated as the parent sample for the MS/MSD analyses on the chain-of-custody.

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

Precision

Precision was evaluated based on the relative percent difference (%RPD) of the parent and FD results and MS/MSD results. Sample RFR-14 was collected in duplicate.

All %RPDs of MS/MSD were compliant.

None of the four target VOCs were detected at or above the reporting limits; therefore, the %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 trip and laboratory blanks 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 two ICVs were 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 two method blanks and one TB associated with the VOC analyses in this SDG. All blanks were non-detect at method detection limits 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%.

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 nine on-post and two off-post groundwater samples and the associated field quality control (QC) samples collected from Camp Stanley Storage Activity (CSSA) on September 13 and 14, 2016. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs).

80972

The field QC samples associated with this SDG were one trip blank (TB), one set of matrix spike (MS)/matrix spike duplicate (MSD), and one field duplicate (FD) sample. TB was analyzed for VOC only. 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 two cooler. Both coolers were received by the laboratory at a temperature of 3ºC, which was within the 2-6ºC range recommended by the CSSA QAPP. There were other samples involved in the shipment. All VOC vials were packed in the same cooler.

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 ten (10) on-post groundwater, two (2) off-post samples, one (1) FD, (1) one set of MS/MSD, and one (1) TB. All samples were collected on September 13 and 14, 2016 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 two analytical batches, #212091 & #212287 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 two laboratory control spike (LCS) samples, MS/MSD, and the surrogate spikes. Sample CS-MW11B-LGR was designated as the parent sample for the MS/MSD analyses.

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

Precision

Precision was evaluated based on the percent relative difference (%RPD) of the MS/MSD results and parent/FD sample results. Sample I10-8 was collected in duplicate.

All %RPDs of the MS/MSD are compliant.

None of the target VOCs were detected in the parent and FD samples, therefore, the %RPD calculations were 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 trip and laboratory blank 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.
- 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 two method blanks and one TB associated with the VOC analyses in this SDG. All blanks were non-detect at method detection limits 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%.

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 fourteen on-post groundwater samples and the associated field quality control (QC) samples collected from Camp Stanley Storage Activity (CSSA) on September 9 and 12, 2016. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs).

80905

The field QC samples associated with this SDG were one trip blank (TB), one set of matrix spike (MS)/matrix spike duplicate (MSD), and two field duplicate (FD) samples. TB was analyzed for VOC only. 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 two cooler. Both coolers were received by the laboratory at a temperature of 3ºC, which was within the 2-6ºC range recommended by the CSSA QAPP. There were other samples involved in the shipment. All VOC vials were packed in the same cooler.

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 ten (10) on-post groundwater, two (2) off-post samples, two (2) FD, (1) one set of MS/MSD, and one (1) TB. All samples were collected on September 13 and 14, 2016 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 two analytical batches, #212091 & #212287 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 two laboratory control spike (LCS) samples, MS/MSD, and the surrogate spikes. Sample CS-MW11B-LGR was designated as the parent sample for the MS/MSD analyses.

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

Precision

Precision was evaluated based on the percent relative difference (%RPD) of the MS/MSD results and parent/FD sample results. Samples CS-4 and I10-8 were collected in duplicate.

All %RPDs of the MS/MSD were compliant.

None of the target VOCs were detected at or above the reporting limits in both sets of parent and FD samples; therefore, the %RPD calculations were 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 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.
- 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 two method blanks and one TB associated with the VOC analyses in this SDG. All blanks were non-detect at method detection limits 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%.

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 three groundwater samples and the associated field quality control (QC) sample collected from off-post Camp Stanley Storage Activity (CSSA) on September 21, 2016. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs).

81016

The field QC sample associated with this SDG was one trip blank (TB). TB was analyzed for VOC only. 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 two cooler. Both coolers were received by the laboratory at a temperature of 3.5 ºC, which was within the 2-6ºC range recommended by the CSSA QAPP. There were other samples involved in the shipment. All VOC vials were packed in the same cooler.

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 three (3) on-post groundwater samples and one (1) TB. All samples were collected on September 21, 2016 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, #212287 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 cannot not be evaluated since there were no 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 trip and laboratory blank 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.
- 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. All blanks were non-detect at method detection limits 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%.

DATA VERIFICATION SUMMARY REPORT

for on-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 three groundwater samples and the associated field quality control (QC) samples collected from on-post Camp Stanley Storage Activity (CSSA) on September 27, 2016. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs) and metals including arsenic, barium, cadmium, chromium, copper, lead, zinc, and mercury.

81066

The field QC samples associated with this SDG was one trip blank (TB) and one set of parent/field duplicate (FD). TB was analyzed for VOC only. 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 two cooler. The coolers were received by the laboratory both at a temperature of 3.0ºC, which was within the 2-6ºC 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 four (4) on-post groundwater samples, a FD, and one (1) TB. All samples were collected on September 27, 2016. All samples 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 analytical batches #212385 and #212461 under one set 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) of the parent and FD results. CS-10 was collected in duplicate.

All %RPDs of the parent/FD sample results 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 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.

- 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. All blanks were non-detect at method detection limits 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%.

ICP-AES METALS

General

The ICP-AES portion of this SDG consisted of four (4) on-post groundwater samples including one FD. All samples were collected on September 28, 2016. All samples were analyzed for arsenic, barium, cadmium, chromium, copper, lead, and zinc.

The ICP-AES metals analyses were performed using USEPA SW846 Method 6010B. 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.

The samples for ICP-AES metals were digested in batch #212484. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recoveries were within acceptance criteria.

Precision

Precision was measured based on the %RPD of parent and FD concentrations. Sample CS-10 was collected in duplicate.

Only Barium and Zinc were detected above the reporting limits in both parent and FD samples. The %RPD for Barium is 4% and for Zinc is 14%, both within the CSSA QAPP 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 preservation and holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

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

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- No dilution test was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP-AES analyses in this SDG. All blanks were free of 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-AES metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERCURY

General

The mercury portion of this SDG consisted of four (4) on-post groundwater samples including one FD. All samples were collected on September 28, 2016 and were analyzed for mercury.

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

The mercury samples were prepared in batch #212672. The analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recovery was within acceptance criteria.

Precision

Precision was measured based on the %RPD of the parent and FD results. Sample CS-10 was collected in duplicate.

The %RPD calculation was not applicable since mercury was not detected in both parent and FD samples.

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 for cross contamination of samples during analysis.

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

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

There was one method blank 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.

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

DATA VERIFICATION SUMMARY REPORT

for on-post sample collected from

CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers one groundwater sample and the associated field quality control (QC) samples collected from on-post Camp Stanley Storage Activity (CSSA) on October 3rd, 2016. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs) and metals including arsenic, barium, cadmium, chromium, copper, lead, zinc, and mercury.

81129

The field QC samples associated with this SDG was one trip blank (TB) and one set of matrix spike/matrix spike duplicate (MS/MSD). TB was analyzed for VOC only. 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. There were three coolers shipped out of CSSA on October 5th. Samples in this SDG were all stored in the same 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.

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 one (1) on-post groundwater samples, a set of MS/MSD, and one (1) TB. All samples were collected on October 3rd, 2016. All samples were 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 analytical batch #212659 under one set 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, MS/MSD, and the surrogate spikes. Sample CS-13 was designated as the parent sample for the MS/MSD analyses.

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

Precision

Precision was evaluated based on the relative percent difference (%RPD) of the MS and MSD results.

All %RPDs of the MS/MSD sample results 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 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.

- 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. All blanks were non-detect at method detection limits 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%.

ICP-AES METALS

General

The ICP-AES portion of this SDG consisted of one (1) on-post groundwater sample and a set of MS/MSD. All samples were collected on October 3rd, 2016. All samples were analyzed for arsenic, barium, cadmium, chromium, copper, lead, and zinc.

The ICP-AES metals analyses were performed using USEPA SW846 Method 6010B. 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.

The samples for ICP-AES metals were digested in batch #212879. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS, MS, and MSD. CS-13 was designated as the parent sample for the MS/MSD analyses.

The LCS, MS, and MSD recoveries were within acceptance criteria.

Precision

Precision was measured based on the %RPD of MS/MSD results.

All %RPDs 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 preservation and holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

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

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- No dilution test was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP-AES analyses in this SDG. All blanks were free of 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-AES metals results for the sample in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERCURY

General

The mercury portion of this SDG consisted of one (1) on-post groundwater sample and a set of MS/MSD. All samples were collected on October 3rd, 2016 and were analyzed for mercury.

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

The mercury samples were prepared in batch #212672. The analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS, MS, and MSD.

The LCS, MS, and MSD recoveries were within acceptance criteria.

Precision

Precision was measured based on the %RPD of the MS and MSD results.

The %RPD was 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 for cross contamination of samples during analysis.

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

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

There was one method blank 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.

Mercury result for the sample in this SDG was considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.