FINAL

SEPTEMBER 2006

On-Post
Quarterly Groundwater Monitoring Report

Prepared For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

January 2007

GEOSCIENTIST CERTIFICATION

September 2006 On-post Quarterly Groundwater Monitoring Report

For

Department of the Army

Camp Stanley Storage Activity

Boerne, Texas

I, Kimberly S. Vaughn, P.G., hereby certify that the September 2006 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 verbal information provided by the CSSA Environmental Office, laboratory data provided by APPL, and field data obtained during groundwater monitoring conducted at the site in September 2006, and is true and accurate to the best of my knowledge and belief.

_____

Kimberly S. Vaughn, P.G.
State of Texas
Geology License No. 6068

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Date

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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 2006. Laboratory analytical results are presented along with potentiometric and isoconcentration contour figures. The purpose of this report is to present a summary of the sampling results. Similar reports will summarize the planned December 2006 and March 2007 sampling results. The results from all four 2006 quarterly monitoring events (March, June, September, and December) will be described in detail in an 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.

Groundwater monitoring scoped under the Air Force Center for Environmental Excellence (AFCEE) 4P/AE Contract 41624-03-D-8613, Task Order (TO) 0207, was performed September 11, 2006 through September 15, 2006, at CSSA. On-post groundwater monitoring conducted under this TO began with this sampling event. Groundwater monitoring conducted prior to September 2006 was conducted under various TOs as shown in **Table 1** of the **Introduction to the Groundwater Monitoring Program, Volume 5** of the **CSSA Environmental Encyclopedia**. AFCEE provides technical oversight of the monitoring program.

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 (DQO) 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 **3008(h) Administrative Order on Consent** (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 Evaluation (Parsons, 2005)** which provided recommendations for sampling based on a long-term monitoring optimization (LTMO) study performed for the CSSA groundwater monitoring program. LTMO study sampling frequencies were implemented on-post in December 2005, as approved by the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA).

2.0 BASEWIDE FLOW DIRECTION AND GRADIENT

Forty water level measurements were recorded on September 11, 2006, from on-post monitoring wells completed in the Lower Glen Rose (LGR), Bexar Shale (BS), and Cow Creek (CC) formations. The groundwater potentiometric surface map illustrating groundwater elevations from the LGR zones in September 2006 is shown in **Figure 2-1**.

The September 2006 potentiometric surface map for LGR-screened wells exhibited a wide range of groundwater elevations, from a minimum of 874.32 feet MSL at CS-MW10-LGR to a maximum 1027.96 feet MSL at CS-MWG-LGR. Groundwater elevations are generally higher in the northern and central portions of CSSA, and decrease to the southwest and southeast. Groundwater elevations in September 2006 dropped 6.40 feet from the elevations measured in June 2006, reflecting the ongoing drought in the area. September 2006 groundwater elevations were some of the lowest elevations recorded since 1999 in the LGR wells. From June 13, 2006, to September 11, 2006, weather station south (WS-S) recorded 16 rainfall events with 5.84 inches and from June 13, 2006, to September 11, 2006, weather station north (WS-N) recorded 17 rainfall events totaling 5.86 inches of rain.

Well CS-MW4-LGR in the central portion of CSSA usually has one of the highest groundwater elevations of LGR screened wells. The elevation is usually 20 to 40 feet higher than the nearest comparable wells (CS-MW2-LGR and CS-MW5-LGR). However, in the presence of a drought in the area these elevations have leveled off. The higher elevations were measured in well CS-MWH-LGR (1009.31' MSL) and CS-MW9-LGR (989.01' MSL) reflecting the general trend of north to southwest.

An overall groundwater gradient averaged across CSSA is to the south at 0.0099 ft/ft. The groundwater gradient varies in direction and velocity in different areas of CSSA. Groundwater gradients calculated from different LGR wells ranged from 0.0054 ft/ft to 0.0160 ft/ft.

Historical groundwater elevations have been recorded since 1992. Previous droughts resulted in water levels decreasing substantially in both 1999/2000 and _1996. Since December 2005, the current drought has caused groundwater elevations to decrease each quarter. The September 2006 average groundwater elevations are the lowest that CSSA has recorded since the monitoring program began in 1992 and are lower than those recorded in 1996 and 1999.

3.0 SEPTEMBER ANALYTICAL RESULTS

3.1 Monitoring Wells

Under the provisions of the groundwater monitoring DQOs and the LTMO study, the schedule for sampling on-post for September 2006 included sixteen on-post wells. Well CS-9 was added to the sampling schedule due to elevated mercury and lead levels. **Table 3-1** provides a sampling overview for September 2006 and the schedule under the LTMO recommendations. Due to the decrease in groundwater elevations this event, seven wells (CS-MW4-LGR, CS-MW6-LGR, CS-MW7-LGR, CS-MW11B-LGR, CS-MW18-LGR, CS-4, and CS-D) could not be sampled because the water level was below the dedicated low-flow pump depth. The

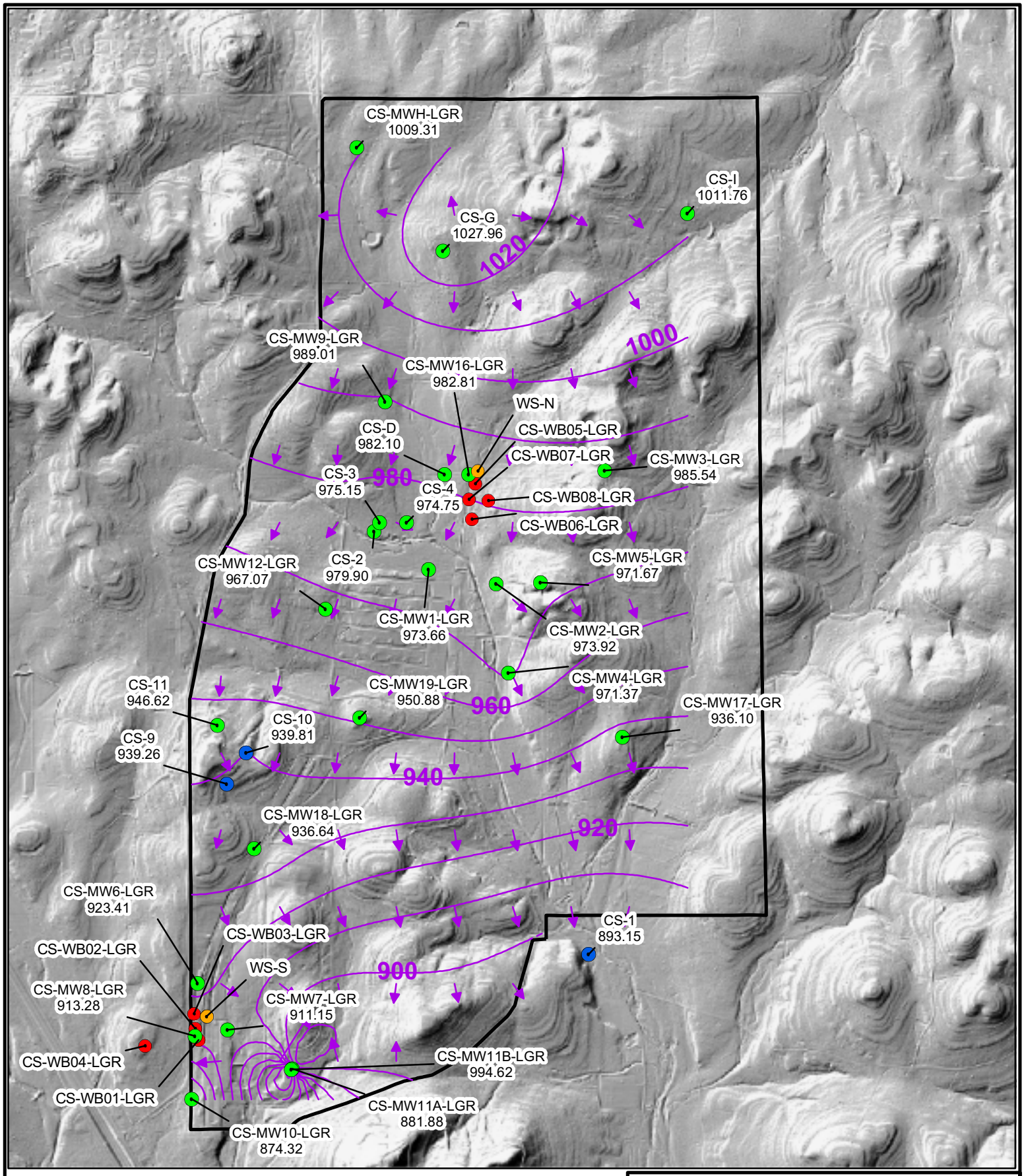

Figure 2.1

September 2006 Potentiometric Surface Map, LGR Wells

Camp Stanley Storage Activity

PARSONS

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Table 3-1
Overview of the On-Post Monitoring Program

Count	Well ID	*Analytes*	*Current Sample Date*	*Next Sample Date*	*Sampling Frequency*
1	CS-MW1-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
2	CS-MW1-BS	(VOC on-post short list)	Sep-07	Sep-09	Biennial
3	CS-MW1-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
4	CS-MW2-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
5	CS-MW2-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
6	CS-MW3-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
7	CS-MW4-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
8	CS-MW5-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
9	CS-MW6-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
10	CS-MW6-BS	(VOC on-post short list)	Sep-07	Sep-09	Biennial
11	CS-MW6-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
12	CS-MW7-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
13	CS-MW7-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
14	CS-MW8-LGR	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
15	CS-MW8-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
16	CS-MW9-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
17	CS-MW9-BS	(VOC on-post short list)	Sep-07	Sep-09	Biennial
18	CS-MW9-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
19	CS-MW10-LGR	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
20	CS-MW10-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
21	CS-MW11A-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
22	CS-MW11B-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
23	CS-MW12-LGR	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
24	CS-MW12-BS	(VOC on-post short list)	Sep-07	Sep-09	Biennial
25	CS-MW12-CC	(VOC on-post short list)	Sep-07	Sep-09	Biennial
26	CS-MW16-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
27	CS-MW16-CC	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
28	CW-MW17-LGR	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
29	CS-MW18-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
30	CS-MW19-LGR	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
31	**CS-1**	**(VOC full list & metals)**	**Jun-06**	**Mar-07**	**Every 9 months***
32	CS-2	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
33	CS-4	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
34	**CS-9**	**(VOC full list & metals)**	**Jun-06**	**Mar-07**	**Every 9 months***
35	**CS-10**	**(VOC full list & metals)**	**Jun-06**	**Mar-07**	**Every 9 months***
36	CS-11	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
37	CS-D	(VOC on-post short list)	Sep-06	Mar-07	Semi-annual
38	CS-MWG-LGR	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*
39	CS-MWH-LGR	(VOC on-post short list)	Sep-07	Sep-09	Biennial
40	CS-I	(VOC on-post short list)	Jun-06	Mar-07	Every 9 months*

*Wells recommended for annual sampling frequency in the LTMO are scheduled every nine months (every third quarter) to gather seasonal data.

remaining wells (CS-MW1-LGR, CS-MW2-LGR, CS-MW3-LGR, CS-MW5-LGR, CS-MW9-LGR, CS-MW11A-LGR, CS-MW16-LGR, and CS-MW19-LGR) were sampled using low-flow pumps. Wells CS-9 and CS-MW16-CC were sampled using submersible pumps.

Wells sampled by low-flow pumps were purged until the field parameters stabilized. Field parameters including pH, temperature and conductivity were recorded to ensure stabilization during well purging. On-post monitoring wells were sampled in September 2006 for the volatile organic compounds (VOCs) 1,1-dichloroethene, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,2- dichloroethene (*trans*-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride. The nine CSSA metals (barium, copper, zinc, cadmium, mercury, chromium, nickel, arsenic, and lead) were also sampled in September 2006 for drinking water well CS-9 only. Samples were analyzed by Severn Trent Laboratories in Arvada, CO. All detected concentrations of VOCs and metals are presented in **Table 3-2**. Full analytical results are presented in **Appendix B**.

Results from on-post monitoring wells are considered definitive data and are subject to data validation and verification under the provisions of the CSSA Quality Assurance Project Plan (QAPP). Parsons data package numbers TO 0207 #1 and #2 containing the analytical results from this sampling event were received by Parsons October 2, 2006. Data validation was conducted and the data validation summary was submitted to AFCEE on November 1, 2006. AFCEE approval for the data packages was received November 8, 2006. Cumulative historical analytical results can be found in **Tables 6** and **7** of the **Introduction to the Quarterly Groundwater Monitoring Program** (Parsons, 2001) (**Volume 5, Groundwater**).

3.2 Westbay-equipped Wells

Under the provisions of the groundwater monitoring DQOs and the LTMO study, the schedule for on-post sampling in September 2006 included the four Westbay wells CS-WB01, CS-WB02, CS-WB03 and CS-WB04. Westbay wells CS-WB05, CS-WB06, CS-WB07 and CS-WB08 are not sampled as part of the groundwater monitoring program but are sampled under the solid waste management unit B-3 bioreactor monitoring. Results for those wells are presented in a separate report. These wells are sampled on a semi annual frequency under the LTMO study. All detected concentrations of VOCs are presented in **Table 3-3**. The Westbay wells are sampled for the VOCs 1,1-dichloroethene, *cis*-1,2-DCE, *trans*-1,2-DCE, PCE, TCE, and vinyl chloride.

CS-WB01-LGR-04 had detections of PCE and TCE for the first time since September 2004. CS-WB02-LGR-01 was dry in March 2006 and in the September 2006 event had detections of PCE at 10 µg/L and TCE at 4 µg/L. In CS-WB03 the top two zones in the LGR were dry. In CS WB04, LGR zones 01, 03, and 04 had PCE detections for the first time in September 2006. The next sampling event is scheduled for March 2007.

4.0 SUMMARY

- The MCL was exceeded for PCE, TCE, and *cis*-1,2-DCE in wells CS-MW1-LGR, CS-MW16-LGR, and CS-MW16-CC during the September 2006 event.

- PCE was detected in six (CS-MW1-LGR, CS-MW2-LGR, CS-MW5-LGR, CS-MW11A-LGR, CS-MW16-LGR, and CS-MW19-LGR) of ten wells sampled during the September 2006 event. Wells CS-MW1-LGR and CS-MW16-LGR exceeded the MCL while all other well detections were below the RL.
- TCE was detected in five (CS-MW1-LGR, CS-MW2-LGR, CS-MW5-LGR, CS-MW16-LGR, and CS-MW16-CC) of the ten wells sampled during the September 2006 event. CS-MW1-LGR, CS-MW16-LGR, and CS-MW16-CC all reported detections above the MCL for TCE.
- *Cis*-1,2-DCE was detected in five (CS-MW1-LGR, CS-MW2-LGR, CS-MW5-LGR, CS-MW16-lGR, and CS-MW16-CC) of the ten wells sampled in September 2006. The MCL was exceeded in well CS-MW16-CC.
- *Trans*-1,2-DCE was reported in three (CS-MW1-LGR, CS-MW16-lGR, and CS-MW16-CC) of the ten wells sampled in September 2006. The MCL was not exceeded for *trans*-1,2-DCE.
- 1,1-DCE and vinyl chloride were also reported in well CS-MW16-CC, both detections were below the RL.
- No VOCs were detected in well CS-9. However, a metals sample was collected from well CS-9 after well rehabilitation was complete. Copper, arsenic, and cadmium were reported below the RL. Barium and zinc were detected above the RL but below the MCL and lead was detected above the MCL. A follow up sample was collected on 9/28/06 by the TCEQ and lead exceeded the MCL again. This well has been taken offline until the lead issue is solved.
- Monitoring wells CS-MW4-LGR, CS-MW6-LGR, CS-MW7-LGR, CS-MW11B-LGR, CS-MW18-LGR, CS-4, and CS-D were not sampled due to extremely low water levels.
- Three zones in CS-WB01, one zone in CS-WB02, seven zones in CS-WB03 and one zone in CS-WB04 had PCE above the MCL.
- Three zones in CS-WB01, two zones in CS-WB02, four zones in CS-WB03 and three zones in CS-WB04 had TCE above the MCL.
- Water levels decreased an average of 6.40 feet this quarter. The water levels are at the lowest levels recorded since the groundwater monitoring program began in 1992.

Table 3-2
September 2006 On-Post Quarterly Groundwater Results, Detected Analytes

Well ID	Date Sampled	1,1-DCE	*cis* -1.2-DCE	PCE	*trans* -1,2-DCE	TCE	Vinyl Chloride	Additional Comments
CS-MW1-LGR	9/12/06	--	**18**	**10**	**0.23F**	**26**	--	
CS-MW2-LGR	9/13/06	--	**1.6**	**0.23F**	--	**0.24F**	--	
CS-MW2-LGR FD	9/13/06	--	**1.6**	**0.23F**	--	**0.22F**	--	
CS-MW3-LGR	9/12/06	--	--	--	--	--	--	
CS-MW5-LGR	9/13/06	--	**0.81F**	**0.54F**	--	**0.76F**	--	
CS-MW9-LGR	9/12/06	--	--	--	--	--	--	
CS-MW11A-LGR	9/13/06	--	--	**1.2F**	--	--	--	
CS-MW16-LGR	9/12/06	--	**68***	**54**	**0.39F**	**64***	--	
CS-MW16-CC	9/12/06	**0.47F**	**100***	--	**34**	**7.8**	**0.57F**	
CS-MW19-LGR	9/13/06	--	--	**0.37F**	--	--	--	
CS-9	9/13/06	--	--	--	--	--	--	
Laboratory Detection Limits and Maximum Contaminant Levels								
Method Detection Limit	MDL	0.074	0.098	0.14	0.056	0.10	0.078	
Reporting Limit	RL	1.2	1.2	1.4	0.60	1.0	1.1	
Maximum Contaminant Level	MCL	7	70	5	100	5	2	

Well ID	Sample Date	Barium	Chromium	Copper	Nickel	Zinc	Arsenic	Cadmium	Lead	Mercury
CS-9	9/13/06	**0.036**	--	**0.0079F**	--	**1.7**	**0.00036F**	**0.00011F**	**0.028**	**0.00036F**
Laboratory Detection Limits and Maximum Contaminant Levels										
Method Detection Limit	MDL	0.001	0.0026	0.0045	0.0078	0.0045	0.00021	0.00004	0.00018	0.000027
Reporting Limit	RL	0.005	0.01	0.01	0.01	0.05	0.02	0.002	0.002	0.001
Maximum Contaminant Level	MCL	2	0.1	1.3	--	--	0.01	0.005	0.015	0.002

Precipitation per Quarter:	Mar-06	Jun-06	Sep-06
WS-S	1.11	11.18	5.84
WS-N	2.26	5.63	5.86

BOLD = Above the MCL
BOLD = Above the RL
BOLD = Above the MDL (F flagged)
** = dilution run was performed. Values are in µg/L*

Data Qualifiers:
F- The analyte was positively identified but the associated numerical value is below the RL.
J - The analyte was positively identified, the quantitation is an estimation.
U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
M- Matrix Effect Present

"--" indicates the result was non-detect
All values are reported in µg/L

Table 3-3
September 2006 Westbay Analytical Results, Detected Analytes

Well ID	Date Sampled	1,1-DCE	*cis* -1.2-DCE	PCE	*trans* -1,2-DCE	TCE	Vinyl Chloride
CS-WB01-UGR-01	9/27/06	dry	dry	dry	dry	dry	dry
CS-WB01-LGR-01	9/27/06	--	--	**2.7**	--	**1.8F**	--
CS-WB01-LGR-02	9/27/06	--	--	**5.7**	--	**2.5**	--
CS-WB01-LGR-03	9/27/06	--	--	**2.4**	--	**5.8**	--
CS-WB01-LGR-04	9/27/06	--	--	**0.20F**	--	**0.20F**	--
CS-WB01-LGR-05	9/27/06	--	--	--	--	**0.21F**	--
CS-WB01-LGR-06	9/27/06	--	--	**0.39F**	--	**0.60F**	--
CS-WB01-LGR-07	9/27/06	--	--	**18**	--	**14**	--
CS-WB01-LGR-08	9/27/06	--	--	**0.56F**	--	**0.94F**	--
CS-WB01-LGR-09	9/27/06	--	**0.31F**	**10**	--	**17**	--
CS-WB02-UGR-01	9/27/06	dry	dry	dry	dry	dry	dry
CS-WB02-LGR-01	9/27/06	--	--	**10**	--	**4**	--
CS-WB02-LGR-02	9/27/06	dry	dry	dry	dry	dry	dry
CS-WB02-LGR-03	9/27/06	--	--	**3.6**	--	**2.1**	--
CS-WB02-LGR-04	9/27/06	--	--	**2.9**	--	**12**	--
CS-WB02-LGR-05	9/27/06	--	--	**0.96F**	--	**4.4**	--
CS-WB02-LGR-06	9/27/06	--	--	**0.98F**	--	**6.3**	--
CS-WB02-LGR-07	9/27/06	--	--	**0.9F**	--	**0.63F**	--
CS-WB02-LGR-08	9/27/06	--	--	**2.7**	--	**2.2**	--
CS-WB03-UGR-01	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB03-LGR-01	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB03-LGR-02	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB03-LGR-03	9/28/06	--	**0.4F**	**23**	--	**10**	--
CS-WB03-LGR-04	9/28/06	--	--	**22**	--	**9.5**	--
CS-WB03-LGR-05	9/28/06	--	--	**19**	--	**7**	--
CS-WB03-LGR-06	9/28/06	--	--	**15**	--	**2.1**	--
CS-WB03-LGR-07	9/28/06	--	--	**9.2**	--	**1.5**	--
CS-WB03-LGR-08	9/28/06	--	--	**11**	--	**1.1**	--
CS-WB03-LGR-09	9/28/06	--	--	**11**	--	**6.8**	--
CS-WB04-UGR-01	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB04-LGR-01	9/28/06	--	--	**0.44F**	--	--	--
CS-WB04-LGR-02	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB04-LGR-03	9/28/06	--	--	**0.20F**	--	--	--
CS-WB04-LGR-04	9/28/06	--	--	**0.17F**	--	--	--
CS-WB04-LGR-05	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB04-LGR-06	9/28/06	--	**3.0**	**0.65F**	**0.27F**	**8.2**	--
CS-WB04-LGR-07	9/28/06	--	**2.3**	**0.87F**	**0.24F**	**5.8**	--
CS-WB04-LGR-08	9/28/06	--	--	**0.43F**	--	**1.1**	--
CS-WB04-LGR-09	9/28/06	--	--	**7.4**	--	**8.6**	--
CS-WB04-LGR-10	9/28/06	--	--	**0.94F**	--	**0.60F**	--
CS-WB04-LGR-11	9/28/06	--	--	**1.1F**	--	--	--
Laboratory Detection Limits							
Method Detection Limit	MDL	0.074	0.098	0.14	0.056	0.10	0.078
Reporting Limit	RL	1.2	1.2	1.4	0.60	1.0	1.1
Maximum Contaminant Level	MCL	7	70	5	100	5	2

BOLD = Above the MCL
BOLD = Above the RL
BOLD = Above the MDL (F flagged)

Values are in µg/L

APPENDIX A

EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT

Appendix A. Evaluation of Data Quality Objectives Attainment

Activity	Objectives	Action	Objective Attained?	Recommendations
Field Sampling	Conduct field sampling in accordance with procedures defined in the project work plan, SAP, QAPP, and HSP.	All sampling was conducted in accordance with the procedures described in the project plans.	Yes.	NA
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 11, 2006.	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 11, 2006 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 semiannually and will be sampled again during the March 2007 event.	Yes.	Continue sampling.

Activity	Objectives	Action	Objective Attained?	Recommendations
	Identify any temporal changes in hydraulic gradients due to seasonal influences (2.1.5).	Downloaded data from continuous-reading transducer in wells: CS-MW16-LGR, CS-MW4-LGR, CS-MW9-LGR, CS-MW9-BS, CS-MW9-CC, CS-MW11A-LGR, CS-MW11B-LGR, CS-MW18-LGR, CS-MW1-LGR, CS-MW1-CC, CS-MW2-LGR, CS-MW2-CC, CS-MW12-LGR, CS-MW12-CC, CS-MW17-LGR, CS-MW19-LGR, and CS-MW16-CC. Data was also downloaded from the northern and southern continuous-reading weather stations WS-N and WS-S. Water levels will be graphed at these wells against precipitation and season through September 2006 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 10 of 41 CSSA wells. Of the 16 wells scheduled to be sampled in September 2006 seven wells (CS-MW4-LGR, CS-MW6-LGR, CS-MW7-LGR, CS-MW11B-LGR, CS-MW18-LGR, CS-4 and CS-D) were not sampled due to the water levels falling below the dedicated low-flow pumps. Well CS-9 was added to the sampling schedule this quarter.	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 (COCs) 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-MW1-LGR, CS-MW2-LGR, CS-MW3-LGR, CS-MW5-LGR, CS-MW9-LGR, CS-MW11A-LGR, CS-MW16-LGR, CS-MW16-CC, CS-MW19-LGR, and CS-9. Samples were analyzed for the selected VOCs using USEPA method SW8260B. Well CS-9 was also sampled for the 9 CSSA metals. Analyses were conducted in accordance with the AFCEE QAPP and approved variances. All RLs were below MCLs, as listed below:	Yes.	Continue sampling.

Activity	Objectives	Action	Objective Attained?	Recommendations
		ANALYTE / **RL (UG/L)** / **MCL (UG/L)** Chloroform 0.4 100 Chloromethane 1.3 -- Dibromochloromethane 0.5 100 1,1-DCE 1.2 7 *cis*-1,2-DCE 1.2 70 *trans*-1,2-DCE 0.6 100 Methylene Chloride 2 5 PCE 1.4 5 TCE 1.0 5		
		ANALYTE / **RL (UG/L)** / **MCL (UG/L)** Barium 5 2000 Chromium 10 100 Copper 10 1300 Nickel 10 100 Zinc 10 11000 Arsenic 5 50 Cadmium 1 3 Lead 2 15 Mercury 1 2		
Contamination Characterization (Ground Water Contamination) (Continued)	Meet AFCEE QAPP quality assurance requirements.	Samples were analyzed in accordance with the CSSA QAPP and approved variances. Parsons chemists verified all data, and AFCEE approval was obtained.	Yes.	NA
		All data flagged with a "U," "J," and "F" are usable for characterizing contamination. All "R" flagged data are considered unusable.	Yes.	NA

Activity	Objectives	Action	Objective Attained?	Recommendations
		Previously, an 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 2006

Appendix B
September 2006 Quarterly Groundwater Analytical Results

Well ID	Date Sampled	1,1-DCE	*cis* -1.2-DCE	PCE	*trans* -1,2-DCE	TCE	Vinyl Chloride	Additional Comments
CS-MW1-LGR	9/12/06	0.074U	**18**	**10**	**0.23F**	**26**	0.078U	
CS-MW2-LGR	9/13/06	0.074U	**1.6**	**0.23F**	0.056U	**0.24F**	0.078U	
CS-MW2-LGR FD	9/13/06	0.074U	**1.6**	**0.23F**	0.056U	**0.22F**	0.078U	
CS-MW3-LGR	9/12/06	0.074U	0.098U	0.14U	0.056U	0.10U	0.078U	
CS-MW5-LGR	9/13/06	0.074U	**0.81F**	**0.54F**	0.056U	**0.76F**	0.078U	
CS-MW9-LGR	9/12/06	0.074U	0.098U	0.14U	0.056U	0.10U	0.078U	
CS-MW11A-LGR	9/13/06	0.074U	0.098U	**1.2F**	0.056U	0.10U	0.078U	
CS-MW16-LGR	9/12/06	0.074U	**68***	**54**	**0.39F**	**64***	0.078U	
CS-MW16-CC	9/12/06	**0.47F**	**100***	0.14U	**34**	**7.8**	**0.57F**	
CS-MW19-LGR	9/13/06	0.074U	0.098U	**0.37F**	0.056U	0.10U	0.078U	
CS-9	9/13/06	0.074U	0.098U	0.014U	0.056U	0.10U	0.078U	

Well ID	Sample Date	Barium	Chromium	Copper	Nickel	Zinc	Arsenic	Cadmium	Lead	Mercury
CS-9	9/13/06	**0.036**	0.0026U	**0.0079F**	0.0078U	**1.7**	**0.00036F**	**0.00011F**	**0.028**	**0.00036F**

BOLD, BOXED & SHADED = Above the MCL
BOLD & BOXED = Above the RL
BOLD = Above the MDL (F flagged)
** = dilution run was performed. Values are in µg/L*

Data Qualifiers:
F- The analyte was positively identified but the associated numerical value is below the RL.
J - The analyte was positively identified, the quantitation is an estimation.
U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
M- Matrix Effect Present

"--" indicates the result was non-detect
All values are reported in µg/L

APPENDIX C

WESTBAY GROUNDWATER MONITORING ANALYTICAL RESULTS SEPTEMBER 2006

Appendix C
September 2006 Westbay Analytical Results

Well ID	Date Sampled	1,1-DCE	*cis* -1.2-DCE	PCE	*trans* -1,2-DCE	TCE	Vinyl Chloride
CS-WB01-LGR-01	9/27/06	0.074U	0.098U	**2.7**	0.056U	**1.8F**	0.078U
CS-WB01-LGR-02	9/27/06	0.074U	0.098U	**5.7**	0.056U	**2.5**	0.078U
CS-WB01-LGR-03	9/27/06	0.074U	0.098U	**2.4**	0.056U	**5.8**	0.078U
CS-WB01-LGR-04	9/27/06	0.074U	0.098U	**0.20F**	0.056U	**0.20F**	0.078U
CS-WB01-LGR-05	9/27/06	0.074U	0.098U	0.14U	0.056U	**0.21F**	0.078U
CS-WB01-LGR-06	9/27/06	0.074U	0.098U	**0.39F**	0.056U	**0.60F**	0.078U
CS-WB01-LGR-07	9/27/06	0.074U	0.098U	**18**	0.056U	**14**	0.078U
CS-WB01-LGR-08	9/27/06	0.074U	0.098U	**0.56F**	0.056U	**0.94F**	0.078U
CS-WB01-LGR-09	9/27/06	0.074U	**0.31F**	**10**	0.056U	**17**	0.078U
CS-WB02-LGR-01	9/27/06	0.074U	0.098U	**10**	0.056U	**4**	0.078U
CS-WB02-LGR-02	9/27/06	dry	dry	dry	dry	dry	dry
CS-WB02-LGR-03	9/27/06	0.074U	0.098U	**3.6**	0.056U	**2.1**	0.078U
CS-WB02-LGR-04	9/27/06	0.074U	0.098U	**2.9**	0.056U	**12**	0.078U
CS-WB02-LGR-05	9/27/06	0.074U	0.098U	**0.96F**	0.056U	**4.4**	0.078U
CS-WB02-LGR-06	9/27/06	0.074U	0.098U	**0.98F**	0.056U	**6.3**	0.078U
CS-WB02-LGR-07	9/27/06	0.074U	0.098U	**0.9F**	0.056U	**0.63F**	0.078U
CS-WB02-LGR-08	9/27/06	0.074U	0.098U	**2.7**	0.056U	**2.2**	0.078U
CS-WB03-LGR-01	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB03-LGR-02	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB03-LGR-03	9/28/06	0.074U	**0.4F**	**23**	0.056U	**10**	0.078U
CS-WB03-LGR-04	9/28/06	0.074U	0.098U	**22**	0.056U	**9.5**	0.078U
CS-WB03-LGR-05	9/28/06	0.074U	0.098U	**19**	0.056U	**7**	0.078U
CS-WB03-LGR-06	9/28/06	0.074U	0.098U	**15**	0.056U	**2.1**	0.078U
CS-WB03-LGR-07	9/28/06	0.074U	0.098U	**9.2**	0.056U	**1.5**	0.078U
CS-WB03-LGR-08	9/28/06	0.074U	0.098U	**11**	0.056U	**1.1**	0.078U
CS-WB03-LGR-09	9/28/06	0.074U	0.098U	**11**	0.056U	**6.8**	0.078U
CS-WB04-LGR-01	9/28/06	0.074U	0.098U	**0.44F**	0.056U	0.10U	0.078U
CS-WB04-LGR-02	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB04-LGR-03	9/28/06	0.074U	0.098U	**0.20F**	0.056U	0.10U	0.078U
CS-WB04-LGR-04	9/28/06	0.074U	0.098U	**0.17F**	0.056U	0.10U	0.078U
CS-WB04-LGR-05	9/28/06	dry	dry	dry	dry	dry	dry
CS-WB04-LGR-06	9/28/06	0.074U	**3.0**	**0.65F**	**0.27F**	**8.2**	0.078U
CS-WB04-LGR-07	9/28/06	0.074U	**2.3**	**0.87F**	**0.24F**	**5.8**	0.078U
CS-WB04-LGR-08	9/28/06	0.074U	0.098U	**0.43F**	0.056U	**1.1**	0.078U
CS-WB04-LGR-09	9/28/06	0.074U	0.098U	**7.4**	0.056U	**8.6**	0.078U
CS-WB04-LGR-10	9/28/06	0.074U	0.098U	**0.94F**	0.056U	**0.60F**	0.078U
CS-WB04-LGR-11	9/28/06	0.074U	0.098U	**1.1F**	0.056U	0.10U	0.078U

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