

**MINUTES FOR TECHNICAL INTERCHANGE MEETING #4  
CAMP STANLEY STORAGE ACTIVITY  
CONTRACT NO. F41624-00-D-8024, TASK ORDER 008  
PARSONS 743322.02000**

Date: April 11, 2006 (Tuesday)  
Time: 9:00 A.M. - 12:30 P.M.  
Place: Camp Stanley Storage Activity (CSSA) - Boerne, Texas  
Subject: Technical Interchange Meeting (TIM) #4; Task Order (TO) 0008

Attendees:

<b>Attendee</b>	<b>Organization</b>	<b>Phone</b>
Glaré Sanchez	CSSA ENV	(210)698-5208
Jeff Aston	USACE/CSSA	(210)698-5208
Chris Beal	Portage/CSSA	(210)698-5208
Samantha Elliott	Parsons	(210)347-6012
Julie Burdey	Parsons	(512)719-6062
Eric Tennyson	Parsons	(210)722-4364
Kimberly Vaughn	Parsons	(512)719-6816

Minutes prepared by Kimberly Vaughn, Parsons.

The meeting sign in sheet is included as Attachment 1. The draft December 2005 off-post groundwater report is included as Attachment 2.

**GROUNDWATER REPORT REVISIONS**

*Summary: The purpose of the meeting was to discuss the format of the quarterly groundwater monitoring reports. In general, it was agreed that streamlining the quarterly monitoring reports and adding an annual report would be beneficial to the groundwater monitoring program. The quarterly reports have gotten to be too long and wordy, describing results that are also included in tabular and graphic format. However, trends and the reasons for these trends are not discussed in much detail; an annual report would better serve this purpose.*

First, the purpose of each quarterly report was discussed. This report is intended to accomplish a presentation of the results for the most recent event. Discussions of why certain trends, if any, are occurring should be presented in the conceptual site model or in the annual groundwater report.

It was agreed that each report cannot be a historical presentation of all data, either. The appendix for the cumulative results was discussed. Chris finds this appendix/table very helpful when you need to glance over the results at a certain location and spot any changes over time in the detections, whether they increase or decrease.

We reviewed the Table 3-2 (this table presents the detections only for an event) and discussed the format and the reasons for highlighting, bold text, etc. Glaré would like this table presented for each quarter. She would like to change the format somewhat. Following some discussion, it was determined that the detections table could be organized like the following sample:

<b>Well ID</b>	<b>Date</b>	<b>Chloroform</b>	<b>PCE</b>	<b>TCE</b>	<b><i>cis</i>-1,2-DCE</b>	<b>Comment</b>
LS-2	March 2006	--	--	2.0	--	
	June 2006	--	--	1.0	--	Concentrations decreased
LS-7	March 2006	--	--	2.0	--	
	June 2006	0.1	--	--	--	Concentrations consistently decreased over last year
<b>Precipitation per Quarter:</b>						
WS-1	March 2006	4.5"				
	June 2006					
WS-2	March 2006	4.0"				
	June 2006					

Red values = above the appropriate MCL

Blue values = above 80% of the appropriate MCL

Instead of showing non-detect values with the method detection limit and the “U” flag, a dash should be shown. This is not as confusing for readers to determine whether a value is a non-detect or an actual detection.

The appendix which contains all results, with all non-detects shown with detection limits, and all historical results, should continue to be updated quarterly and made available by e-mail to CSSA staff for their use.

The detections table (sample shown above) will continue to be updated for each quarter in a given year so that reviewers can follow any changes in the well over the year. The annual report prepared in December 2006 will summarize and interpret the results of the March, June, September and December 2006 quarterly events. After further discussion, it was suggested that the table format above always include the previous four quarters, to allow the reviewer to track the trends over time in that well.

The potentiometric maps and the plume isoconcentration contour maps should also be included with the new format detections table for each quarter. The text discussion of the results should be kept to a minimum. Readers should be able to determine from the table that is presented what detections occurred each quarter. The text which discusses what neighborhood wells were sampled, how many, and the sampling rationale should continue to be written for each quarter. Following the data presented in the table, the only other text should be the Summary and Recommendations section. In this section any unusual results and any changes in the sampling schedule or future recommendations should be given. The long discussion included in the text for each neighborhood setting out what was detected and where should be replaced by the table which will present that data to the reader. It does not need to be covered in the text.

The charts which plot transducer data against concentrations or precipitation should be included only in the annual report at the end of the year. Glaré would like a section in the annual report to cover any new wells that were sampled/added to the program. Also any wells that were removed from sampling for any reason, i.e., new well owners refused to sign the access agreement, etc. She would like this to cover significant changes in the sampling program and the reasons for these changes.

We discussed bailer sampling of the wells. If the pump has a mechanical problem and has to be pulled, would it be worth the time and effort to get a bailer sample? Samantha pointed out that unless the pump is pulled, there is a danger of tangling the bailer with the pump lines if you drop a bailer into the well. Chris asked, if the pump is pulled already for another reason, why not grab a bailer sample at that point? Glaré asked how critical it is to obtain samples from these wells each quarter. Kimberly and Julie pointed out that unless this is a drinking water well and potential receptors are at risk, then we do have years of data for the on-post monitoring wells, and the monitoring wells are not actually critical data each quarter.

Glaré would like an executive summary included in the annual report which highlights significant issues or changes throughout the year of monitoring. The annual report should include the evaluations that were made in previous reports.

**Action Items:**

- **Parsons will continue to update the cumulative analytical results table each quarter and provide that table by e-mail to CSSA.**
- **Parsons will streamline the on-post and off-post quarterly reports, starting with the March 2006 sampling event reports. Each report will include summary tables (showing last four quarters of results), figures, brief summary text, and recommendations for the next round of sampling. The off-post report will also include a brief description of the number of neighborhood wells sampled.**
- **An annual report will be prepared to discuss trends, reasons for trends, precipitation charts, water level charts, GAC results, and changes to the sampling program (wells added/removed), any community issues, etc. It will be more detailed, and will include an executive summary.**

**Attachment 1**  
**Meeting Sign in Sheet**

## TO-08 TIM Meeting #4 Sign-In Sheet

Date:	April 11, 2006
Time:	9:00 a.m.
Place:	CSSA – Boerne, TX
Project:	CSSA Groundwater Monitoring
Contractor:	Parsons
Contract No.:	AFCEE 4P; TO-0006

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Attachment 2  
**(Draft December 2005 Off post Report)**

**DRAFT**

**December 2005**

**Off-Post**

**Quarterly Groundwater Monitoring Report**



*Prepared For*

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

**March 2006**

## **GEOSCIENTIST CERTIFICATION**

### **December 2005 Off-post Quarterly Groundwater Monitoring Report**

**For**

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

I, Kimberly S. Riley, P.G., hereby certify that the December 2005 Off-post Quarterly Groundwater Monitoring Report for the Camp Stanley Storage Activity installation in Boerne, Texas accurately represents the site conditions of the subject area. This certification is limited only to geoscientific products contained in the subject report and is made on the basis of written and 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 December 2005, and is true and accurate to the best of my knowledge and belief.

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

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Date

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## DECEMBER 2005 OFF-POST GROUNDWATER MONITORING REPORT CAMP STANLEY STORAGE ACTIVITY

### 1.0 INTRODUCTION

Off-post groundwater monitoring scoped under the Air Force Center for Environmental Excellence (AFCEE) 4P/AE Contract F41624-03-D-8613, Task Order (TO) 0008, was performed December 19-23, 2005. The primary objective of the off-post groundwater monitoring program is to determine whether concentrations of chlorinated volatile organic compounds (VOCs) detected in off-post public and private drinking water wells exceed safe drinking water standards. A secondary objective of the off-post groundwater monitoring program is to determine the lateral and vertical extent of the contaminant plumes associated with past releases near Building 90 (Area of Concern [AOC]-65) or from Solid Waste Management Units (SWMUs) B-3 and O-1. Another objective of the off-post groundwater monitoring program is to assess whether there are apparent trends (decreasing or increasing) in contaminant levels over time in the sampled wells. Background information regarding off-post private and public water supply wells is located in the **CSSA Environmental Encyclopedia (Volume 5, Groundwater)**. All previously sampled off-post wells are shown on **Figure 1.1**, including off-post wells sampled during the December 2005 event.

The quarterly off-post groundwater monitoring program was initiated in September 2001 in accordance with the **Off-Post Monitoring Program and Response Plan (CSSA, June 2002)**, herein referred to as the Plan). Action levels for detection of VOCs and decisions to sample an off-post well are based on the following:

- If VOC contaminant levels are  $\geq 90$  percent of the maximum contaminant level (MCL) ( $\geq 4.5$  micrograms per liter [ $\mu\text{g/L}$ ] based on preliminary data received from the laboratory for tetrachloroethene [PCE] and trichloroethene [TCE]) and the well is used as a potable water source, bottled water will be supplied within 24 hours of receipt of the data, and a confirmation sample will be collected from the well within 14 days of receipt of the final validated analytical report. If the follow-up sampling confirms contaminants of concern (COC) are above 90 percent of the MCLs, the well will be evaluated and either installation of an appropriate method for wellhead treatment or connection to an alternative water source will be performed. Costs related to installation and maintenance of wellhead treatment equipment or connection to an alternative water source will be borne by CSSA.
- If VOC contaminant levels are  $\geq 80$  but  $\leq 90$  percent of the MCL ( $4.0 \mu\text{g/L}$  for PCE and TCE) during any single monitoring event based on preliminary data from the laboratory and the well is used as a potable water source, it will be monitored monthly. If the follow-up sampling confirms that COCs are  $\geq 80$  but  $\leq 90$  percent of the MCL, it will continue to be re-sampled monthly until the VOC levels fall below the 80 percent value.

**Figure 1.1 Off-Post Well Sampling Locations December 2005 With On-Post Locations Shown**

- If any VOC COC is detected at levels greater than or equal to the method detection limit (MDL) (historically 0.06 µg/L for PCE and 0.05 µg/L for TCE), and < 80 percent of the MCL, the well will be re-sampled on a quarterly basis. This sampling will be conducted concurrently with on-post sampling events and will be used to develop historical trends in the area. Quarterly sampling will continue for a minimum of one year, after which the sampling frequency will be reviewed and possibly decreased.
- If VOCs are not detected during the initial sampling event (*i.e.*, no VOC contaminant levels above the MDL), further sampling of the well will be considered. A well with no detectable VOCs may be removed from the sampling list. However, if analytical data suggest future plume migration could influence the well, it will be resampled as needed. The well owner, EPA, and the Texas Commission on Environmental Quality (TCEQ), will be apprised of any re-sampling decisions regarding the non-detect wells.
- For wells where a wellhead treatment system has been installed, post-treatment samples will be collected and analyzed after initial system start-up and at 6-month intervals to confirm the system is effectively removing VOCs.

Thirty-one samples were collected from thirty-one off-post wells sampled in December 2005. Post-GAC samples (LS-2/LS-3, LS-6, LS-7, RFR-10, RFR-11, and OFR-3) are collected twice annually and will be sampled again during the March 2006 monitoring event.

An evaluation of the Data Quality Objectives (DQOs) for CSSA's groundwater monitoring program is presented in **Appendix A**. The objectives listed in **Appendix A** also reference appropriate sections of the Order. Overall DQOs for the groundwater investigations at CSSA are provided in **Volume 5**. A comprehensive summary of the results from the December 2005 off-post groundwater sampling event is presented in **Appendix B**, and abbreviated tables showing only the detected compounds are included in the groundwater results discussion in Section 3 of this report. **Appendix C** summarizes pre- and post-GAC system sampling results. A YSI meter was used to collect field parameters (pH, temperature, and conductivity), which were recorded in the logbook. These parameters are used to determine optimum sample conditions. The cumulative historical results, including cations and anions data from off-post groundwater sampling by CSSA, are presented in summary tables located in **Volume 5, Groundwater, Introduction to the Quarterly Groundwater Monitoring Program (Table 8 and Table 9)**. **Table 8** presents the Off-Post Groundwater VOC Analytical Results, and **Table 9** presents the Off-Post Groundwater Metals Analytical Results. Additional cumulative historical results for monitoring conducted from June 2001 to June 2005 is available in **Volume 5, Groundwater**. The laboratory data packages and associated data validation reports for this sampling event are submitted to AFCEE and CSSA separately from this report. A summary of the objectives and sampling rationale for selection of wells for the December 2005 groundwater monitoring event is included in **Table 1.1**.

## 2.0 DECEMBER 2005 GROUNDWATER MONITORING PROCEDURES

Off-post groundwater monitoring was performed December 19 - 23, 2005. Thirty-one off-post wells and three quality assurance samples were collected during the December 2005 quarterly monitoring event, and their locations are shown in **Figure 1.1**. Three wells were not sampled for various reasons. Well FO-J1 would not produce water after purging for one hour, well LS-2 is offline until Bexar Metropolitan replaces the well pump, and the well owner at

RFR-6 indicated the electricity had been disconnected and the well will be plugged and abandoned. Off-post wells sampled during this quarterly monitoring event were selected based on previous sampling results and proximity to both the CSSA boundary and other wells with detections of PCE and TCE. **Table 1.1** illustrates the rationale for selection of wells for sampling based on the Plan and project DQOs. Thirty-three wells were recommended for sampling in the September 2005 Off-Post Quarterly Groundwater Monitoring Event; wells I10-8 and JW-27 were not sampled due to a delay in obtaining the access agreements.

Off-post wells sampled in December 2005 include (see **Figure 1.1** for well locations):

- One public supply well in the Fair Oaks area (FO-22);
- One public well in the Hidden Springs Estates subdivision (HS-2);
- Four public wells (I10-2, I10-5, I10-7 & I10-8) and one privately-owned well in the Interstate I-10 area (I10-4);
- Ten privately-owned wells in the Jackson Woods subdivision (JW-5, JW-7, JW-8, JW-14, JW-15, JW-26, JW-27, JW-28, JW-29, and JW-30);
- Five wells in the Leon Springs Villa area (three public wells: LS-3, LS-4, and LS-6; and two privately-owned wells: LS-5 and LS-7);
- Three privately-owned wells on Old Fredericksburg Road (OFR-1, OFR-2, and OFR-3); and
- Six privately-owned wells in the Ralph Fair Road area (RFR-3, RFR-7, RFR-10, RFR-11, RFR-12 and RFR-13).

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

Thirty-one groundwater samples, three field duplicate samples, two matrix spike/matrix spike duplicate (MS/MSD) pairs, and two trip blanks were submitted to APPL Laboratory (APPL) in Fresno, California for analysis. Groundwater samples were analyzed for the short list of VOCs using SW-846 Method 8260. The EPA-approved short list of VOCs includes bromodichloromethane, bromoform, chloroform, dibromochloromethane, dichlorodifluoromethane, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,2-DCE, 1,1-DCE, methylene chloride, naphthalene, PCE, TCE, toluene, and vinyl chloride. This list represents analytes that were detected in on-post groundwater samples or analytes which may result from natural degradation of the detected on-post compounds.

The data packages (Parsons internal reference TO08 #183 - #185) contain the analytical results for this sampling event. Laboratory results were reviewed and verified according to the guidelines outlined in the CSSA Quality Assurance Project Plan (QAPP). Data packages were received by Parsons on January 11, 2006 through January 13, 2006, and the data verification reports were submitted to AFCEE on January 19, 2006. AFCEE approved these data packages January 26, 2006.

**Table 1.1      Sampling Rationale for December 2005**

### 3.0 DECEMBER 2005 GROUNDWATER MONITORING ANALYTICAL RESULTS

Thirteen wells contained VOCs at concentrations above the MDL in December 2005. Based on historical detections, the lateral extent of VOC contamination extends approximately 0.5 mile beyond the south and west boundaries of CSSA to well LS-4 to the south and I10-7 to the west. Information such as well depth, pump depth, and other pertinent data necessary to properly characterize the vertical extent of migration, is not readily available from most well owners. For the purposes of this report, the concentrations of PCE, TCE, and *cis*-1,2-DCE are the only VOCs presented in summary tables in Section 3.1 through 3.8, as these are the most common COCs detected. Other VOCs, if detected, are discussed in the text and presented in **Appendix B**.

Off-post wells are grouped by community or neighborhood for discussion of the December 2005 results. Concentrations of VOCs detected in December 2005 are presented in **Table 3.1**. Full analytical results from the December 2005 sampling event are presented in **Appendix B**. PCE, TCE, and *cis*-1,2-DCE concentration trends are illustrated in **Figure 3.1** and **Figure 3.2** for wells LS-2, LS-3, LS-6, LS-7, OFR-3, RFR-10, and RFR-11. These wells were selected for trend analysis because they have had detections of PCE and TCE that approach and/or exceed MCLs. **Figure 3.1** includes precipitation data from the CS-MW16-LGR weather station (northern weather station) and the AOC-65 weather station (southern weather station). **Figure 3.2** includes pumping usage from the flowmeters installed at each GAC system. These figures are presented prior to the discussion of December 2005 groundwater sampling results for each neighborhood. **Appendix C** is a comparison of pre- and post-GAC PCE and TCE concentrations.

Methylene chloride has been periodically detected in on- and off-post samples since 1992. However, because methylene chloride was also detected in associated quality control samples, it was concluded the analyte was introduced as a laboratory contaminant and was not present in the groundwater. There are no known historical uses of methylene chloride on-post and methylene chloride has not been detected in the same wells consistently over time, supporting the conclusion that methylene chloride is a laboratory contaminant. In March, June, September, and December 2005 methylene chloride was not detected in any normal samples submitted, but was present in a trip blank, reinforcing that the presence of methylene chloride is due to laboratory procedures.

Chloroform has been detected on-and off-post since 1992. Chloroform is regulated by the EPA as a total trihalomethane (TTM) with a combined MCL of 80 ppb for all TTMs detected. No detections of chloroform and other TTMs have been above the combined MCL. These compounds are regulated as byproducts related to drinking water disinfection. Previous chloroform detections in well JW-14 are related to the well owner adding household bleach to the drinking water well for disinfection purposes. In December 2004 the TTMs in well RFR-13 were approaching the combined MCL of 80 ppb. The well owner was contacted and indicated the well was treated with household bleach for disinfection purposes. For both detections, the well owners were provided TCEQ guidance documents informing the public about well disinfection and proper purging techniques following disinfection. In March and June 2005 the combined TTMs in well RFR-13 decreased significantly. December 2005 TTMs results for well RFR-13 were non-detect and are provided in Section 3.8.

**Table 3.1      December 2005 Off-Post Groundwater Results, Detected Analytes Only**

**Figure 3.1 PCE and TCE Concentration Trends and Precipitation**

**Figure 3.2 PCE and TCE Concentration Trends and Monthly Water Usage**

### 3.1 FAIR OAKS

#### December 2005 Results:

One well (FO-22) in the Fair Oaks area was sampled in December 2005 and no VOCs were detected. Well FO-22 has never had a VOC detection and will continue to be sampled on an annual basis. Well FO-J1 was scheduled to be sampled this quarter but after purging for one hour the well did not produce water. PCE has been consistently detected in this well since June 2003, below the RL.

#### Results Summary:

Wells in the Fair Oaks area were first sampled in September 2001. Through September 2005 sixteen quarterly samples were collected from FO-J1. PCE levels have ranged from non-detects to 0.36 µg/L all below the RL. FO-J1 will remain on the quarterly sampling schedule for upcoming events. Well FO-22 has been sampled annually since September 2001 and will remain on an annual sampling schedule or be sampled as needed in accordance with DQOs. Results for PCE, TCE, and *cis*-1,2-DCE from wells sampled in the Fair Oaks area during the 2005 sampling events are provided in the following table:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/22/2005	FO-J1	0.12F	0.25F	0.53F
	FO-8	ND	ND	ND
6/22/2005 & 6/20/2005	FO-J1	0.21F	ND	ND
	FO-17	ND	ND	ND
9/21/2005	FO-J1	ND	ND	ND
12/22/2005	FO-22	ND	ND	ND

F = Detected above the MDL, but below the RL    ND = Not detected above the MDL    FD = Field duplicate

### 3.2 HIDDEN SPRINGS ESTATES

#### December 2005 Results:

In December 2005, Hidden Springs Estates well HS-2 was sampled and no VOCs were detected. Based on historical detections, HS-2 will remain on the quarterly sampling schedule in accordance with the project DQOs.

#### Results Summary:

Wells in Hidden Springs Estates were first included in CSSA's groundwater monitoring program in December 2001. Over the history of the sampling at well HS-2, PCE levels have ranged from 0.11 to 0.23 µg/L, all below the RL. Well HS-3 has been sampled on an annual schedule with no detections of PCE and/or TCE.

The 2005 results for PCE, TCE, and *cis*-1,2-DCE from Hidden Springs Estates are provided below:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/23/2005	HS-2	0.17F	ND	ND
6/21/2005	HS-2	0.16F	ND	ND
	HS-3	ND	ND	ND
9/20/2005	HS-2	ND	ND	ND
12/20/2005	HS-2	ND	ND	ND

F = Value detected above the MDL, but below the RL ND = not detected above the MDL

### 3.3 INTERSTATE I-10 AREA

#### December 2005 Results:

Five wells in the I-10 area were sampled in December 2005 (I10-2, I10-4, I10-5, I10-7 and I10-8) and no VOCs were detected. Based on historical detections, I10-2 and I10-4 will remain on the quarterly sampling schedule. Well I10-7 will also remain on a quarterly sampling schedule as a plume delineation well to the west. Well I10-5 will remain on an annual sampling schedule in accordance with the DQOs. Newly added well I10-8 will be sampled quarterly for one year to evaluate results and then an evaluation of the sampling frequency under the DQOs will be made.

#### Results Summary:

Wells in the I-10 area were first included in CSSA's groundwater monitoring program in September 2001. PCE levels in I10-2 have ranged from 0.06 to 0.16 µg/L, and in I10-4 from 0.06 to 3.47 µg/L. Results for PCE, TCE, and *cis*-1,2-DCE from I-10 area wells sampled during the 2005 sampling events are provided in the following table:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/22/2005	I10-2	0.12F	0.12F	ND
	I10-4	ND	ND	ND
	I10-7	ND	ND	ND
6/21/2005 to 6/22/2005	I10-2	ND	ND	ND
	I10-4	3.47	1.16	ND
	I10-7	ND	ND	ND
9/21/2005 to 9/22/2005	I10-2	ND	ND	ND
	I10-4	0.13F	ND	ND
	I10-7	ND	ND	ND
12/19/2005 to 12/22/2005	I10-2	ND	ND	ND
	I10-4	ND	ND	ND
	I10-5	ND	ND	ND
	I10-7	ND	ND	ND
	I10-7 FD	ND	ND	ND
	I10-8	ND	ND	ND

F = Value detected above the MDL, but below the RL

ND = not detected above the MDL

### 3.4 JACKSON WOODS

#### December 2005 Results:

In December 2005, ten Jackson Woods Subdivision wells (JW-5, JW-7, JW-8, JW-14, JW-15, JW-26, JW-27, JW-28, JW-29, and JW-30) were sampled. Four of the ten wells sampled, JW-7, JW-8, JW-29, and JW-30, had detections of contaminants of concern below the applicable MCLs. Wells JW-5, JW-14, JW-15, JW-26, JW-27 and JW-28 had no VOC detections. Wells JW-7, JW-8, JW-14, JW-27, JW-28, and JW-30 will continue to be monitored on a quarterly basis because of previous detections. Well JW-29 had no detections the last ten quarters but will remain on the quarterly sampling schedule due to its location as a necessary monitoring point for delineation. Wells JW-5 and JW-15 will be monitored quarterly for one year to evaluate results and then the future sampling frequency will be set according to DQOs. Well JW-5 was sampled for the third time due to the well owners request and no VOCs were detected.

Well JW-7 was initially sampled in September 2003. The December 2005 sampling event was the tenth consecutive quarterly sample from JW-7. PCE and dichlorodifluoromethane were detected at concentrations of 0.49 µg/L and 0.14 µg/L, respectively. PCE concentrations in this well have ranged from 0.22 to 0.65 µg/L, all below the RL. Dichlorodifluoromethane has been detected sporadically in this well, with concentrations ranging from 0.14 µg/L to 0.33 µg/L, below the RL.

Well JW-8 reported PCE at a concentration of 0.19 µg/L, in December 2005. TCE and *cis*-1,2-DCE were not detected in this well until December 2004. PCE levels have ranged between 0.14 to 0.35 µg/L, all below the RL.

Wells JW-14 and JW-15 had no VOC detections in December 2005. Well JW-14 has been sampled quarterly since September 2001. This well has had detections of chloroform since September 2001 ranging from 0.03 to 53.45 µg/L. All chloroform results have been below the TTMs MCL of 80 µg/L. The well owner routinely disinfects this well with household bleach causing TTM to be detected. PCE was last detected in this well in December 2004; all PCE detections have been below the RL. Well JW-15 was sampled for the third time in December 2005 at the well owners request and no VOCs were detected.

Well JW-26 reported no VOC detections. PCE was reported in this well in 2003 however no detections have occurred since December 2003. In accordance with the DQOs this well will remain on an annual sampling schedule.

Well JW-27 had no VOC detections. TCE was first reported in this well in June 2005 at a concentration of 0.10 µg/L, below the RL. It was then added to the quarterly schedule however due to change in well ownership and access agreement issues no sample was collected in September 2005. This well will remain on a quarterly sampling schedule in accordance with the DQOs.

Well JW-28 had no VOC detections in December 2005. This well has had consistent toluene detections since it was first sampled in September 2003, all below the RL. No other VOCs have been detected in this well.

PCE was detected in well JW-29 and the JW-29 field duplicate in December 2005 at concentrations of 0.10 µg/L and 0.14 µg/L, respectively. PCE was previously detected in June

2003. JW-29 will remain on the quarterly sampling schedule due to recent VOC detections and because it is near impacted wells.

JW-30 and the JW-30 field duplicate had detections of PCE at concentrations of 0.09 µg/L and 0.11 µg/L, in December 2005. PCE levels have ranged from 0.06 µg/L to 0.2 µg/L, all below the RL. Other detections of TCE and *cis*-1,2-DCE were reported in March 2003, December 2004, and March 2005, all below the RL.

Wells JW-5, JW-14, JW-15, JW-26, JW-27, and JW-28 had no VOC detections in December 2005. Wells JW-7, JW-8, JW-14, JW-27, JW-28, JW-29, and JW-30 will remain on the quarterly sampling schedule in accordance with the DQOs.

**Results Summary:**

Off-post sampling was first performed in the Jackson Woods area in 1995 with sampling at JW-30. No VOCs were detected in this well at that time. JW-30 was again sampled in September 1999, and methylene chloride was the only VOC detected. Additional Jackson Woods Subdivision wells have been added to the sampling list since 1999. Results for PCE, TCE, and *cis*-1,2-DCE in wells in the Jackson Woods area sampled during the 2005 sampling events are provided below:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/22/2005 to 3/24/2005	JW-7	0.38F	ND	ND
	JW-8	0.12F	0.21F	0.37F
	JW-9	ND	ND	ND
	JW-12	ND	ND	ND
	JW-14	ND	ND	ND
	JW-14 FD	0.10F	ND	ND
	JW-28	ND	ND	ND
	JW-29	ND	ND	ND
	JW-29 FD	ND	ND	ND
	JW-30	0.10F	0.23F	0.42F
6/21/2005 to 6/23/2005	JW-5	ND	ND	ND
	JW-6	ND	ND	ND
	JW-7	0.35F	ND	ND
	JW-8	0.18F	ND	ND
	JW-8 FD	0.23F	ND	ND
	JW-13	ND	ND	ND
	JW-14	ND	ND	ND
	JW-15	ND	ND	ND
	JW-27	ND	0.10F	ND
	JW-28	ND	ND	ND
	JW-29	ND	ND	ND
	JW-30	ND	ND	ND

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	cis-1,2-DCE (MCL = 70 µg/L)
9/20/2005 to 9/22/2005	JW-5	ND	ND	ND
	JW-7	0.22F	ND	ND
	JW-8	0.25F	ND	ND
	JW-14	ND	ND	ND
	JW-15	ND	ND	ND
	JW-28	ND	ND	ND
	JW-29	ND	ND	ND
12/19/2005 to 12/22/2005	JW-30	0.11F	ND	ND
	JW-5	ND	ND	ND
	JW-7	0.49F	ND	ND
	JW-8	0.19F	ND	ND
	JW-14	ND	ND	ND
	JW-15	ND	ND	ND
	JW-26	ND	ND	ND
	JW-27	ND	ND	ND
	JW-28	ND	ND	ND
	JW-29	0.10F	ND	ND
	JW-29 FD	0.14F	ND	ND
JW-30	0.09F	ND	ND	
JW-30 FD	0.11F	ND	ND	

F = Value detected above the MDL, but below the RL  
FD = Field Duplicate sample

ND = not detected above the MDL  
TAP = Sample collected from water tap inside residence  
Fridge = sample water collected from refrigerator inside residence

### 3.5 LEON SPRINGS VILLA

#### December 2005 Results:

Five wells (LS-3, LS-4, LS-5, LS-6, and LS-7) in the Leon Springs Villa subdivision were sampled in December 2005. All wells had detections below the applicable MCLs.

Well LS-2 was not sampled because the pump malfunctioned. LS-2 will be sampled again when Bexar Metropolitan replaces the down-hole pump. An evaluation of concentration trends through the September 2005 event for LS-2 is given in **Figure 3.1**. PCE concentrations doubled from September to December 2002. From December 2002 to December 2005 PCE levels had been decreasing and had fallen below the RL.

Results for LS-3 included VOC concentrations of TCE and PCE at 0.27 µg/L and 1.12 µg/L, respectively. Both concentrations were below the RL. An evaluation of concentration trends through December 2005 in well LS-3 is given in **Figure 3.1**. Based on previous detections, CSSA installed a combined GAC filtration system on wells LS-2 and LS-3 in April 2002. Post GAC samples were collected in September 2005. The well LS-2/LS-3 GAC unit had a full carbon replacement in both canisters September 27 - 29, 2005. Confirmation samples were collected following the carbon replacement to confirm the GAC unit is working properly. One sample (A1) was collected from between the carbon canisters and one sample (A2) was collected after both carbon canisters. Samples A1, A1 field duplicate, and A2 found no VOCs. See **Appendix C** for analytical results. March 2006 will be the next post-GAC sample collection. Wells LS-2 and LS-3 should continue to be sampled quarterly in the future.

In December 2005, no VOCs were detected in well LS-4. Well LS-4 should continue to be sampled quarterly based on previous VOC detections ranging from 0.06 to 0.25 µg/L.

Well LS-5 had a TCE detection of 0.10 µg/L in December 2005. Previous concentrations have been above the MDL and below the RL and MCL for both PCE and TCE. TCE has been consistently detected in this well, at concentrations below the RL ranging from 0.10 to 0.51 µg/L. A new resident occupied the home in March 2005, increasing the pumping from this well. Well LS-5 should remain on the quarterly sampling schedule.

In December 2005, PCE, TCE, and chloroform were detected at concentrations of 1.51 µg/L, 0.79 µg/L, and 0.07 µg/L respectively, in LS-6. PCE was above the RL but below the MCL while TCE, and chloroform concentrations were below the RL. An evaluation of concentration trends in LS-6 through December 2005 is provided in **Figure 3.1**. Well LS-6 is equipped with a GAC treatment system because concentrations exceeded the MCL in the past. On January 10, 2006, routine maintenance was performed by Carbonair on the LS-6 GAC unit, the maintenance included the replacement of carbon canisters and the UV light. Post GAC samples will be collected again in March 2006, see **Appendix C** for previous GAC sample results. Well LS-6 should continue to be sampled on a quarterly schedule.

The LS-7 sample contained concentrations of PCE (2.65 µg/L) and TCE (0.30 µg/L) during the December sampling event. TCE was below the RL, as shown by the concentration trends presented in **Figure 3.1**. PCE was below the MCL and above the RL. Well LS-7 was equipped with a GAC treatment system when previous detections approached the MCL. On January 10, 2006, routine maintenance was performed by Carbonair on the LS-7 GAC unit, the maintenance included the replacement of carbon canisters and the UV light. Post GAC samples are scheduled to be collected again in March 2006, see **Appendix C** for previous GAC sampling results. Well LS-7 should continue to be sampled on a quarterly schedule.

### Results Summary:

Wells from the Leon Springs Villa area were first sampled in December 1999 to determine whether VOCs had migrated off-post to the south of CSSA. Based on past results for VOCs, CSSA installed GAC treatment systems at wells LS-2/LS-3, LS-6, and LS-7. In March and September 2005, semi-annual post-GAC confirmation samples were collected from all Leon Springs wells equipped with GAC systems (**Appendix C**). The samples confirm that the GAC units are working effectively and that VOCs are reduced to concentrations below the applicable drinking water MCLs. Chloroform was detected in post-GAC samples from LS-2/LS-3 at concentrations below the RL and MCL in September 2002, March 2003, September 2003, March 2004, September 2004 and again in March 2005. In March 2005, PCE and TCE were detected below the RL, in sample LS-2/LS-3-A1. Sample port A1 is located between the GAC canisters. Sample port A2 is located after both carbon canisters and is a representative sample of the water being supplied to homeowners. Sample LS-2/LS-3-A2 had a detection of chloroform at 0.10 µg/L, below the RL. In September 2005, post-GAC samples were collected and no VOCs were detected. The next post-GAC sampling event will be conducted in March 2006.

Results for PCE, TCE, and *cis*-1,2-DCE in pre-GAC samples collected from the Leon Springs Villa community wells during 2005 are provided below:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/23/2005	LS-2	2.25	0.40F	ND
	LS-3	1.74	0.19F	ND
	LS-4	0.18F	ND	ND
	LS-5	ND	0.17F	ND
	LS-5 (FD)	ND	0.21F	ND
	LS-6	4.22	0.41F	ND
	LS-7	2.32	0.31F	ND
6/20/2005 to 6/21/2005	LS-2	1.81	0.16F	ND
	LS-3	1.44	0.37F	ND
	LS-4	0.15F	ND	ND
	LS-4 FD	ND	ND	ND
	LS-5	ND	0.10F	ND
	LS-6	1.83	ND	ND
	LS-7	2.5	0.26F	ND
9/19/2005 to 9/20/2005	LS-2	1.55	0.55F	ND
	LS-3	1.09	ND	ND
	LS-4	ND	ND	ND
	LS-5	ND	ND	ND
	LS-6	1.96	0.20F	ND
	LS-7	3.62	0.31F	ND
12/20/2005 to 12/21/2005	LS-3	1.12F	0.27F	ND
	LS-4	ND	ND	ND
	LS-5	ND	0.10F	ND
	LS-6	1.51	0.79F	ND
	LS-7	2.65	0.30F	ND

F = Value detected above the MDL, but below the RL    ND = Not detected above the MDL    FD = Field duplicate

### 3.6 OLD FREDERICKSBURG ROAD AREA

#### December 2005 Results:

Three wells (OFR-1, OFR-2, and OFR-3) along Old Fredericksburg Road were sampled in December 2005. All three wells had detections of VOCs.

In December 2005, PCE was detected at 0.29 µg/L, in well OFR-1 below the RL. The results for OFR-2 reported PCE at a concentration of 0.30 µg/L. Over the history of sampling at these wells, PCE has ranged from 0.29 to 0.49 µg/L in OFR-1 and 0.005 to 0.35 µg/L in OFR-2. These wells should continue to be monitored quarterly in accordance with the DQOs. No trend analysis was prepared for these wells because detections have been well below the MCL.

In December 2005, OFR-3 had detections of PCE (1.99 µg/L), TCE (2.05 µg/L), and dichlorodifluoromethane (0.54 µg/L). The dichlorodifluoromethane concentration was above the MDL but below the RL, while PCE and TCE were above the RLs but below the MCL. In

April 2002, a GAC unit was installed on OFR-3 based on PCE concentrations. On January 10, 2006 routine maintenance was performed by Carbonair on the OFR-3 GAC unit, the maintenance included the replacement of carbon canisters and the UV light. An evaluation of concentration trends in well OFR-3 through December 2005 is provided in **Figure 3.1**. In March 2004 concentrations decreased to below the applicable MCLs but again from June 2004 to December 2005 they exceeded the MCL and decreased to below the MCL. Well OFR-3 should continue to be sampled on a quarterly schedule.

**Results Summary:**

Well OFR-2 was first sampled in December 1995 to determine whether VOCs had migrated off-post to the west of CSSA. Every six months, post-GAC samples are collected to confirm the GAC filtration system at OFR-3 is working. A post-GAC sample was collected in September 2005 and no VOCs were detected. To date, no VOCs have been detected above RLs in the post-GAC samples. The next post-GAC confirmation sample for OFR-3 will be collected in March 2006 and results for previous post-GAC sampling events are given in **Appendix C**. Results for PCE, TCE, and *cis*-1,2-DCE from Old Fredericksburg Road area wells sampled during the 2005 events are provided below:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/21/2005 to 3/24/2005	OFR-1	0.19F	ND	ND
	OFR-2	ND	ND	ND
	OFR-3	1.35F	2.08	ND
	OFR-4	ND	ND	ND
6/20/2005 to 6/22/2005	OFR-1	0.35F	ND	ND
	OFR-1 FD	0.34F	ND	ND
	OFR-2	0.30F	ND	ND
	OFR-3	2.54	2.07	ND
9/19/2005 to 9/21/2005	OFR-1	0.26F	ND	ND
	OFR-1 FD	0.40F	ND	ND
	OFR-2	0.16F	ND	ND
	OFR-3	9.22	4.73	ND
12/20/2005 to 12/22/2005	OFR-1	0.29F	ND	ND
	OFR-2	0.30F	ND	ND
	OFR-3	1.99	2.05	ND

F = Value detected above the MDL, but below the RL      ND = not detected above the MDL  
FD = Field Duplicate sample      Bolded data = Results > MCL

**3.7 RALPH FAIR ROAD AREA**

**December 2005 Results:**

In December 2005, six wells (RFR-3, RFR-7, RFR-10, RFR-11, RFR-12, and RFR-13) in the Ralph Fair Road area were sampled. Of the six wells sampled, one well (RFR-10) had detections greater than the MCL. Wells RFR-3, RFR-7, RFR-12 and RFR-13 reported no VOC detections.

Well RFR-10 concentrations exceeded the MCLs for PCE at 7.29 µg/L and TCE exceeded the RL at a concentration of 3.26 µg/L. *Cis*-1,2-DCE was also detected at a concentration of 0.74 µg/L, below the RL. An evaluation of concentration trends through December 2005 is included in **Figure 3.1**. A GAC filtration system was installed on RFR-10 when concentrations exceeded the MCL. On January 10, 2006, routine maintenance was performed by Carbonair on the RFR-10 GAC unit, the maintenance included the replacement of carbon canisters and the UV light. Well RFR-10 should continue to be sampled on a quarterly schedule.

In December 2005, RFR-11 had detections of PCE (0.68 µg/L) and TCE (1.43 µg/L), both of which were below MCL. Based on previous results, RFR-11 should continue to be sampled on a quarterly schedule. Over the sampling history of this well, PCE and TCE have ranged from 0.89 to 16.73 µg/L and 0.12 to 1.73 µg/L, respectively. A GAC unit was installed in October 2001 when levels began approaching the MCL. On January 10, 2006, routine maintenance was performed by Carbonair on the RFR-11 GAC unit, the maintenance included the replacement of carbon canisters and the UV light. The next post-GAC sample will be collected in March 2006.

In December 2005, well RFR-12 had no VOC detections. Well RFR-12 will remain on the quarterly sampling schedule due to previous detections in accordance with the DQOs.

Well RFR-13 was installed in November 2004 and is a privately owned drinking water well. The well owner indicated the well was treated with household bleach after installation for disinfection purposes. In December 2004, chloroform was detected near the TTMs MCL of 80 µg/L. Since the disinfection treatment the RFR-13 results have steadily decreased. In December 2005 no VOCs were detected in this well. This well should remain on the quarterly sampling schedule in accordance with the plan.

**Results Summary:**

Ralph Fair Road wells RFR-3 and RFR-8 were sampled during the first off-post sampling performed in 1995. Additional Ralph Fair Road wells were sampled beginning in 1999. Wells RFR-10 and RFR-11 required installation of GAC filtration systems in October 2001 when concentrations exceeded the MCL. Post-GAC sampling confirms that the GAC filtration systems are working effectively. See **Appendix C** for the previous post-GAC sampling results. Post-GAC confirmation samples will be collected again in March 2006. Results in 2005 for wells in the Ralph Fair Road area are provided below:

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
3/21/2005 to 3/24/2005	RFR-4	ND	ND	ND
	RFR-5	ND	ND	ND
	RFR-10	8.03	5.19	0.43F
	RFR-11	4.84	0.32F	ND
	RFR-12	ND	0.20F	ND
	RFR-13	ND	ND	ND
	RFR-13 (FD)	ND	ND	ND

Sample Date	Well ID	Concentration (µg/L)		
		PCE (MCL = 5 µg/L)	TCE (MCL = 5 µg/L)	<i>cis</i> -1,2-DCE (MCL = 70 µg/L)
6/20/2005 to 6/22/2005	RFR-8	ND	ND	ND
	RFR-10	17.64	8.14	0.41F
	RFR-11	1.58	1.24	ND
	RFR-12	ND	ND	ND
	RFR-13	ND	ND	ND
9/19/2005 to 9/20/2005	RFR-9	ND	ND	ND
	RFR-9 (FD)	ND	ND	ND
	RFR-10	19.83	8.91	ND
	RFR-11	0.66F	1.46	ND
	RFR-12	ND	ND	ND
12/19/2005 to 12/22/2005	RFR-13	ND	ND	ND
	RFR-3	ND	ND	ND
	RFR-7	ND	ND	ND
	RFR-10	7.29	3.26	ND
	RFR-11	0.68F	1.43	ND
	RFR-12	ND	ND	ND
	RFR-13	ND	ND	ND

F = Value detected above the MDL, but below the RL  
FD = Field duplicate

ND = Not detected above the MDL  
Bolded Data = Results > MCL

#### 4.0 SUMMARY AND RECOMMENDATIONS

##### 4.1 SUMMARY

- The objectives listed in **Table 1.1** were not completely accomplished. Thirty-one of the thirty-four wells scheduled to be sampled for the December event were sampled. Wells FO-J1, LS-2, and RFR-6 were not sampled for various reasons explained in the above text. FO-J1 and LS-2 will be scheduled for sampling in March 2006. Well RFR-6 will be dropped from our sampling list because the well owner reported it will be plugged and abandoned.
- Thirteen of the thirty-one wells sampled reported detections of VOCs in December 2005. Of the wells with VOC detections, only RFR-10 had concentrations above the MCL for PCE. Well RFR-10 had a detection of 7.29 µg/L PCE, which exceeds the MCL of 5.0 µg/L and TCE at a concentration of 3.26 µg/L, below the MCL. RFR-10 was previously equipped with a GAC filtration system.
- Four wells had detections of VOCs reported at concentrations below the MCL but above the RL for one or more of PCE and TCE. PCE was detected above the RL in wells LS-6, LS-7 and OFR-3. TCE was detected above the RL in wells OFR-3, RFR-10, and RFR-11. Wells LS-2/LS-3, LS-6, LS-7, RFR-10, RFR-11, and OFR-3 have been equipped with GAC filtration systems.
- Eight wells reported concentrations of VOCs above the MDL, but below the RL for one or more of the following analytes: PCE, TCE, dichlorodifluoromethane, *cis*-1,2-DCE, and chloroform. These analytes were detected in samples JW-7, JW-8, JW-29, JW-29 (FD), JW-30, JW-30 (FD), LS-3, LS-5, OFR-1, and OFR-2.

- Well I10-4 showed a significant decrease in PCE concentration from the June 2005 event to the September 2005 event. This well has reported two detections above the RL in March 2004 (2.22 µg/L) and June 2005 (3.47 µg/L). In September 2005, PCE levels in this well had decreased to 0.13 µg/L and in December 2005 no VOCs were detected in this well. PCE detections in this well have ranged from 0.12 µg/L to 3.47 µg/L. I10-4 will continue to be monitored on a quarterly basis in accordance with the Plan.
- Eighteen wells had no detections from the short list of VOCs: FO-22, HS-2, I10-2, I10-4, I10-5, I10-7, I10-7 (FD), I10-8, JW-5, JW-14, JW-15, JW-26, JW-27, JW-28, LS-4, RFR-3, RFR-7, RFR-12, and RFR-13.
- PCE concentrations decreased between September 2005 and December 2005 in six wells: I10-4, JW-30, LS-6, LS-7, OFR-3, and RFR-10.
- TCE concentrations decreased in five wells: JW-27, LS-7, OFR-3, RFR-10, and RFR-11.
- PCE concentrations increased in seven wells: JW-7, JW-8, JW-29, LS-3, OFR-1, OFR-2, and RFR-11.
- TCE concentrations increased in three wells: LS-3, LS-5, and LS-6.
- January 10, 2006, routine maintenance was performed on GAC treatment systems LS-6, LS-7, OFR-3, RFR-10, and RFR-11. Carbonair performed the work which included changing the carbon canisters and the ultraviolet (UV) light. Post-GAC samples will be collected again in March 2006.
- Maintenance was performed on GAC unit LS-2/LS-3 on September 27–29, 2005. The carbon in both canisters was replaced with new carbon. Post-GAC confirmation samples reported no VOC detections indicating that the GAC unit is working properly.

## 4.2 RECOMMENDATIONS

- In accordance with Plan and DQO requirements, wells with historical detections above 90 percent of the applicable MCL (LS-2, LS-3, LS-6, LS-7, OFR-3, RFR-10, and RFR-11) will continue to be sampled on a quarterly basis, including the March 2006 event.
- Wells with detections above 80 percent of the applicable MCLs are required to be sampled on a monthly basis in accordance with the Plan and DQOs. No wells sampled during the December 2005 event will be sampled monthly. All wells with VOC detections greater than 80 percent of the applicable MCLs have GAC filtration systems installed and are already included in the quarterly monitoring.
- Wells with detections of VOCs at less than 80 percent of the MCLs (JW-7, JW-8, JW-29, JW-30, LS-3, LS-5, LS-6, LS-7, OFR-1, OFR-2, OFR-3, RFR-10, and RFR-11) in December 2005 will continue to be sampled on a quarterly basis, including the March 2006 event in accordance with Plan requirements. Depending on concurrence to the pending LTMO study by regulatory agencies, the sampling frequency for these wells may be reduced in the future.

- Post-GAC confirmation samples will be collected at all off-post wells with GAC systems during the March 2006 sampling event. This will include wells LS-2, LS-3, LS-6, LS-7, OFR-3, RFR-10, and RFR-11.
- For future sampling events, including March 2006, wells where no VOCs were detected may be sampled as needed, depending on historical detections. December 2005 wells with no VOCs detected include FO-22, HS-2, I10-2, I10-4, I10-5, I10-7, I10-8, JW-5, JW-14, JW-15, JW-26, JW-27, JW-28, LS-4, RFR-3, RFR-7, RFR-12 and RFR-13.
- Three wells (FO-J1, LS-2, and RFR-6) were not sampled in December 2005 due to previously discussed reasons. Future testing will be scheduled in the upcoming March 2006 sampling event or after pending issues are resolved.
- In the event additional wells are located to the west and southwest of CSSA, they may be added to future sampling events. Future sampling events will continue to include wells to the west of CS-D and CS-MW16-LGR (Fair Oaks and Jackson Woods Subdivision areas) to confirm they continue to meet drinking water standards.
- In accordance with project DQOs, the rationale for selection of wells to be sampled in March 2006 is provided in **Table 4.1**.

**Table 4.1 Sampling Rationale for March 2006**

**APPENDIX A**  
**EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT**

**Appendix A Evaluation of Data Quality Objectives Attainment**

Activity	Objectives	Action	Objective Attained?	Recommendations
Field Sampling	Conduct field sampling in accordance with procedures defined in the project work plan, SAP, QAPP, and HSP.	All sampling was conducted in accordance with the procedures described in the project plans.	Yes	NA
Contamination Characterization (Groundwater Contamination)	Determine the potential extent of off-post contamination (§2.3.1 of the DQOs for the Groundwater Contamination Investigation, revised November 2003).	Samples for laboratory analysis were collected from selected off-post public and private wells, which are located within a ½ mile radius of CSSA.	Partially	Replace wells where no VOCs were detected with wells that may be identified in the future, located to the west and southwest of AOC-65 to provide better definition of plume 2. Continue sampling of wells to the west of plume 1 (Fair Oaks and Jackson Woods) to confirm any detections possibly related to plume 1.
	Meet CSSA QAPP quality assurance requirements.	Samples were analyzed in accordance with the CSSA QAPP, and approved variances. A chemist verified all data.	Yes	NA
		All data flagged with a “U” and “J” are usable for characterizing contamination.	Yes	NA

Activity	Objectives	Action	Objective Attained?	Recommendations
	Evaluate CSSA monitoring program and expand as necessary (§2.3.1 of the DQOs for the Groundwater Contamination Investigation, revised November 2003). Determine locations of future monitoring locations.	Evaluation of data collected is ongoing and is reported in this quarterly groundwater report and will be reported in future quarterly groundwater reports. Additional information covering the CSSA monitoring program is available in Volume 5, CSSA Environmental Encyclopedia.	Yes	Continue data evaluation and quarterly teleconferences for evaluation of the monitoring program. Each teleconference/planning session covers expansion of the quarterly monitoring program, if necessary.
Project schedule/ Reporting	The quarterly monitoring project schedule shall provide a schedule for sampling, analysis, validation, verification, and reports for monitoring events off-post.	A schedule for sampling, analysis, validation, and verification and data review and reports is provided in this quarterly groundwater report and will be reported in future quarterly groundwater reports. Additional information covering the CSSA monitoring program is available in Volume 5, CSSA Environmental Encyclopedia.	Yes	Continue quarterly reporting to include a schedule for sampling, analysis, validation, and verification and data review and data reports.

Activity	Objectives	Action	Objective Attained?	Recommendations
Remediation	Evaluate the effectiveness of GACs (§3.2.3) and install as needed (§3.2.5 both of the DQOs for the Groundwater Contamination Investigation, revised November 2003).	Perform maintenance as needed. Install new GACs as needed.	Yes	Monthly maintenance to the off-post GAC systems to be continued by Parsons' personnel. Quarterly (or as needed) maintenance to the off-post GAC systems by additional subcontractors to continue. Evaluations of future sampling results for installation of new GAC systems will occur as needed.

**APPENDIX B**  
**DECEMBER 2005 QUARTERLY OFF-POST**  
**GROUNDWATER ANALYTICAL RESULTS**

**APPENDIX C**  
**PRE- AND POST-GAC SAMPLE COMPARISONS FOR**  
**WELLS LS-6, LS-7, RFR-10, RFR-11, LS-2/LS-3 AND OFR-3**

**Pre- and Post-GAC Sample Comparisons for  
Wells LS-6, LS-7, RFR-10, RFR-11, LS-2/LS-3 and OFR-3**

LS-2/LS-3					LS-6				
Date	PCE (µg/L)		TCE (µg/L)		Date	PCE (µg/L)		TCE (µg/L)	
	Pre	Post	Pre	Post		Pre	Post	Pre	Post
03/18/02	2.9/1.3	NA	0.29/0.63	NA	08/15/01	GAC UNIT INSTALLED			
04/2002	GAC UNIT INSTALLED				08/30/01	5.7	ND	0.57	ND
04/11/02	0.82/1.53	ND	ND/ND	ND	09/19/01	6.7	ND	0.35	ND
06/12/02	2.22/1.06	NA	0.31/0.20	NA	09/27/01	20.0	NA	0.38	NA
09/17/02	2.62/2.9	ND	0.17/0.21	ND	12/18/01	1.97	ND	ND	ND
03/12/03	4.25/3.99	ND	0.30/0.35	ND	03/18/02	2.7	ND	0.2	ND
9/9/03	2.21/1.37	ND	0.39/0.14	ND	09/16/02	1.58	ND	0.1	ND
3/3/04	0.98/1.09	ND	0.11/0.17	ND	03/12/03	4.19	ND	0.21	ND
9/21/04	1.41/1.81	0.59F/ND	0.26F/0.24F	0.22F/ND	9/11/03	2.49	ND	0.38	ND
3/23/05	2.25/1.74	0.74/ND	0.40F/0.19F	0.33F/ND	3/1/04	3.61	ND	0.47	ND
9/20/05	1.55/1.09F	ND/ND	0.55F/ND	ND/ND	9/20/04	2.08	ND	ND	ND
					3/21/05	4.22	ND	0.41F	ND
					9/19/05	1.96	ND	0.20F	ND

LS-7					OFR-3				
Date	PCE (µg/L)		TCE (µg/L)		Date	PCE (µg/L)		TCE (µg/L)	
	Pre	Post	Pre	Post		Pre	Post	Pre	Post
08/07/01	GAC UNIT INSTALLED				03/19/02	12.15	NA	5.65	NA
08/08/01	NA	ND	NA	ND	04/16/02	9.38	NA	3.77	NA
08/30/01	1.1	NA	ND	NA	4/30/02	GAC UNIT INSTALLED			
09/19/01	4.5	ND	0.81	ND	04/30/02	NA	ND	NA	ND
09/27/01	6.6	NA	0.68	NA	06/11/02	10.22	NA	6.24	NA
12/18/01	1.4	ND	ND	ND	09/16/02	2.96	ND	2.59	ND
03/18/02	2.7	ND	0.24	ND	03/12/03	2.81	ND	3.25	ND
09/16/02	2.41	ND	0.34	ND	9/11/03	10.82	ND	6.42	ND
03/12/03	4.01	ND	0.41	ND	3/1/04	2.87	ND	1.98	ND
9/11/03	3.47	ND	0.34	ND	9/20/04	1.61	ND	1.67	ND
3/1/04	3.1	ND	0.33	ND	3/21/05	1.35F	ND	2.08	ND
9/20/04	2.77	ND	ND	ND	9/19/05	9.22	ND	4.73	ND
3/21/05	2.32	ND	0.31F	ND					
9/19/05	3.62	ND	0.31F	ND					

NA – not applicable (post-GAC not sampled during this event)

ND – indicates analyte was not detected at or above the MDL.

**Pre- and Post-GAC Sample Comparisons, cont'd:**

RFR-10					RFR-11				
Date	PCE (µg/L)		TCE (µg/L)		Date	PCE (µg/L)		TCE (µg/L)	
	Pre	Post	Pre	Post		Pre	Post	Pre	Post
10/09/01	GAC UNIT INSTALLED				10/04/01	16.0	NA	0.35	NA
10/12/01	20.89	ND	8.21	ND	10/12/01	16.73	NA	0.58	NA
12/17/01	9.02	ND	5.85	ND	10/16/01	GAC UNIT INSTALLED			
03/18/02	4.5	ND	2.2	ND	10/25/01	NA	ND	NA	ND
09/16/02	9.19	ND	4.84	ND	12/17/01	12.44	ND	ND	ND
03/12/03	13.88	ND	8.37	ND	03/19/02	5.71	ND	1.05	ND
9/11/03	24.56	ND	10.07	ND	09/16/02	8.44	ND	0.67	ND
3/1/04	23.23	ND	10.25	ND	03/12/03	10.02	0.07F	0.12	ND
9/20/04	18.76	ND	7.99	ND	9/11/03	0.99	ND	1.63	ND
3/21/05	8.03	ND	5.19	ND	3/4/04	0.99	ND	1.25	ND
9/19/05	19.83	ND	8.91	ND	9/20/04	1.93	ND	1.05	ND
					3/21/05	4.84	ND	0.32F	ND
					9/19/05	0.66F	ND	1.46	ND

NA – not applicable (post-GAC not sampled during this event)

ND – indicates analyte was not detected at or above the MDL.

**APPENDIX D**  
**OFF-POST CUMULATIVE ANALYTICAL**