CSSA B-3 BIOREACTOR OPERATIONS
PERFORMANCE STATUS REPORT
(QUARTER 5, MONTHS 13 – 15, MAY – JULY, 2008)

OCTOBER 3, 2008

This status report summarizes the operation of a bioreactor at Solid Waste Management Unit (SWMU) B-3 from May 1, 2008 through July 31, 2008; comprising the fifth quarter of bioreactor operations and monitoring since system start-up. This status report includes descriptions of current conditions, field observations, analytical results, and an anticipated schedule of activities for the next reporting period. Analytical results from monthly and quarterly regulatory and performance sampling through July 2008 are attached for reference. Parsons site personnel working on this project during the reporting period include Ken Rice, Kyle Caskey, Samantha Elliott, Eric Tennyson, Adrien Lindley, Michael Zugelder, and Edward Galbavy.

Executive Summary

Site conditions were drier than normal with few significant rain events through the quarter. Injection of extracted groundwater continued through most of the quarter. The few interruptions resulted from reaching the automatic cut-off water levels in the extraction wells. Approximately 8,167,461 gallons of groundwater extracted from CS-MW16-LGR and CS-MW16-CC have been injected into bioreactor trench 1 since the start of injection. A total of 2,981,355 gallons of extracted groundwater from wells CS-MW16-LGR and CS-MW16-CC were injected into the bioreactor during quarter 5. The majority of extracted groundwater, ~2,000,000 gallons, was from the CS-MW16-LGR well, while ~1,000,000 gallons were extracted from the CS-MW16-CC well. The TCEQ authorized CSSA's request for reduced data collection and reporting requirements on the SWMU B-3 Bioreactor Class V Underground Injection Control (UIC) permit. The UIC reporting requirements are now on a semi-annual basis with the next report due October, 2008.

Data from monitoring efforts indicate that the B-3 bioreactor has continued to maintain appropriate geochemical conditions for effective anaerobic dechlorination of chlorinated aliphatic hydrocarbons (CAHs). Geochemical parameters indicating optimal conditions include the following:

- Concentrations of dissolved oxygen (DO) are less generally than 0.5 milligrams per liter (mg/L) and oxidation-reduction potential (ORP) values are less than -100 millivolts (mV), indicating an anaerobic environment conductive to dechlorination of CAHs within the trenches;
- Production of methane indicating that fermentation is occurring; and
- Hydrogen concentrations are greater than 1.0 nanomoles per liter (nmol/L), indicating that there is sufficient electron donor present to stimulate anaerobic dechlorination of CAHs.

Evidence that anaerobic dechlorination of trichloroethene (TCE) appears to have been stimulated with the production of the intermediate dechlorination products *cis*-1,2-dichloroethene (*cis*-DCE), *trans*-1,2-dichloroethene (*trans*-DCE) and vinyl chloride (VC). The dechlorination end product ethene was indicated in the analytical results for samples collected in the trench sumps.

Summary of Bioreactor Operation

All prior analytical results from monitoring of the bioreactor sumps indicate that the SWMU B-3 trenches contain significant levels of *cis*-DCE as well as concentrations of other dechlorination products (e.g., VC, ethene). In addition, *trans*-DCE and minor amounts of toluene and other fuel related compounds were identified during monitoring of bioreactor trench 1 sumps during the quarter. A summary of the analytical data collected for the reporting period is included in Table 1. A summary of monthly and quarter 5 monitoring results from the surrounding wells and bioreactor trench sumps are attached, analytical results of the surrounding SWMU B-3 multi-port Westbay monitoring points and monitoring wells are also attached.

Results of VOC analysis from monitoring data indicate that injected groundwater from CS-MW16-CC, and the uppermost saturated zones of the Westbay® wells CS-WB05 and CS-WB07 contain < 100 micrograms per liter (µg/L) of TCE/PCE and *cis*-DCE and CS-MW16-LGR and the uppermost saturated zones of the Westbay® wells CS-WB06 and CS-WB08 contain > 150 micrograms per liter (µg/L) of TCE/PCE and *cis*-DCE. Quarterly data from the bioreactor trench sumps indicate that contaminant mass stable or decreasing slightly, as *cis*-DCE concentrations have remained low with t*rans*-DCE concentrations increasing and significant VC and ethene concentrations in the trench sumps have been maintained.

Water quality field measurements from the bioreactor sumps generally indicate that DO remains low (< 0.5 mg/L), ORP averages less than -250 mV, pH ~ 6.6, temperatures range from 23.5 ^{o}C to 25.8 ^{o}C, and specific conductivity ranges from 0.403 to 1.012 millisiemens per centimeter (mS/cm). Other observations regarding the data collected during this reporting period are listed below.

Through the 5th quarter, 3.48 inches of precipitation were measured at the B-3 bioreactor site. Average water thickness in Trench 1 during this period is approximately 4.56 feet.

Attached are graphs including a cumulative total volume of recovered groundwater from CS-MW16-LGR and CS-MW16-CC applied into trench 1, the B-3 Trench 1 average water thickness with rainfall data and average water applied daily to trench 1, and the water level elevations in the defined uppermost saturated zone (zone LGR-03B) of the B-3 multi-port monitoring wells with rainfall data.

Analytical Data Observations

1. Arsenic (As) and manganese (Mn) were reported in bioreactor trench water samples at concentrations ranging from Non-Detect (ND) to 10.9 µg/L for As (MCL is 10 µg/L) and from 202 to 826 µg/L for Mn (MCL is 50 µg/L). Elevated levels of Mn and As were not reported in any of the surrounding monitoring wells during this quarter. Elevated levels of Mn were reported in CS-WB05-CC-01 (366 µg/L) and CS-WB06-UGR-01 (986 µg/L); all other zones reported Mn levels below the MCL and no elevated levels of As were reported in any of the MPMW zones. The elevated levels are likely due to changing pH conditions of the groundwater and the reduction of naturally occurring As and Mn within the limestone media to more soluble forms. .
2. DO and ORP values remain favorable for the reduction of CAHs even with the increased volume of water applied via the continuous operation of the automated injection system, indicating that anaerobic reducing conditions were maintained.
3. The volatile organic compound summary for the trenches indicate a transition from a predominately two-component (VC and cis-DCE) to a three-component (VC, trans-DCE, and ethene) chemical composition in water collected from the trench sumps.

This transition indicates the further reduction of contaminants along the degradation pathway toward the end product ethene. Total molar concentrations in the trench sumps remain stable or decreased slightly through the quarter.

4. The presence of *trans*-DCE in Trench 1 samples at concentrations relatively much higher than are observed in monitoring wells (and in some cases higher than either cis-1,2-DCE or Vinyl Chloride in trench samples) may indicate an abiotic dechlorination mechanism. However, studies of several sites (Loeffler et al, Environ. Sci. Technol. 2004, 38, 4300-4303) have demonstrated that trans-1,2-DCE can be produced biotically; these studies implicated Dehalococcoides (DHC) organisms in this process.
5. The dissolved hydrogen concentration in trench 1 sump samples was in the range consistent with reductive dechlorination of CAHs by DHC.
6. Saturated conditions are being maintained within bioreactor Trench 1 with an average water thickness for the quarter of approximately 4.56 feet.
7. Water Supply issues – Due to continuing drought conditions and decreases in water table elevations, it is likely that the volume of injection water from CS-MW16 wells will decrease. The low-level cut-offs have been reached for both CS-MW16-CC and LGR wells, causing the extraction wells to cut out intermittently.
8. The continued difference in the ratios of tetrachloroethene:trichloroethene:cis-DCE (PCE:TCE:cis-DCE) in samples from well WB05-CC01 and WB05-CC02 may indicate that either different dechlorination mechanisms operate in the two groundwater zones or that they are not in communication and have different sources of contaminants.

Anticipated Schedule for Next Period (August, 2008 – October, 2008):

- Continue monitoring and maintenance activities for delivery of groundwater to the bioreactor trenches.
- Monthly monitoring events in August and September (Months 16 and 17), and quarterly monitoring event in October (Month 18) for bioreactor system.
- Continue UIC monthly monitoring with semi-annual reporting due October, 2008.

Specific Data Observation Notes for Attachments

- Analytical results from the B-3 Trench 1 Sump samples, shown in Table 5.1.2, presents data from the quarter 5 sampling events.
- Table 5.1.1 indicates a water thickness of approximately 4.56 feet in trench 1 was maintained.
- Table 5.1.2 indicates that VC was present at moderate to high concentrations in trench 1 sumps (between 1.6 and 130 µg/L) and Ethene was observed in concentrations ranging from ND to 7.75 µg/L.
- Table 5.3.3 indicates that vinyl chloride was present (4.2 µg/L) in the sample taken from monitoring well CS-B3-MW01, which remains consistent with samples collected through the previous 12 months. VC was also observed in monitoring well in the extraction well CS-MW16-CC (0.34 µg/L).
- Table 5.4.4 indicates that the DHC bacteria populations remained stable or increased slightly from month 12 through quarter 5 in trench 1 sump 2.
- The changes in molar fraction and total molar concentrations shown in graphs of quarter 5 trench 1 sumps indicate a continued reduction in contaminant mass to end products VC and ethene.
- Figure 5.2.5 shows that the water levels in Westbay wells are significantly influenced by precipitation, or lack there of, and pumping at CS-MW16-LGR.

Analytical Summary Data

Table 1 Summary of Analysis Presented for Reporting Period

Event	VOCs	TDS	TOC	DOC	MEE & CO_2	SO_3^-	Chloride, Sulfate	Alkalinity	N, NO_3 & NO_2	Fe^{2+}	Mn	Metals	H^+	DHC
Quarterly Sampling[a] (4)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regulatory Sampling[b] (25)	✓	✓												
Regulatory Sampling (26)	✓	✓												
Monthly Sampling[c] (13)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regulatory Sampling (27)	✓	✓												
Regulatory Sampling (28)	✓	✓												
Monthly Sampling (14)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regulatory Sampling (29)	✓	✓												
Regulatory Sampling (30)	✓	✓												
Quarterly Sampling (5)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

□ - Not Sampled

a - Quarterly sampling includes samples from B3-trench sumps, Monitoring Wells, and Multi-port (Westbay) wells.
b - Regulatory sampling includes samples from the B3 groundwater injection system.
c - Monthly sampling includes samples from B3-trench sumps, the uppermost saturated intervals of the multi-port wells (Zone 03B).

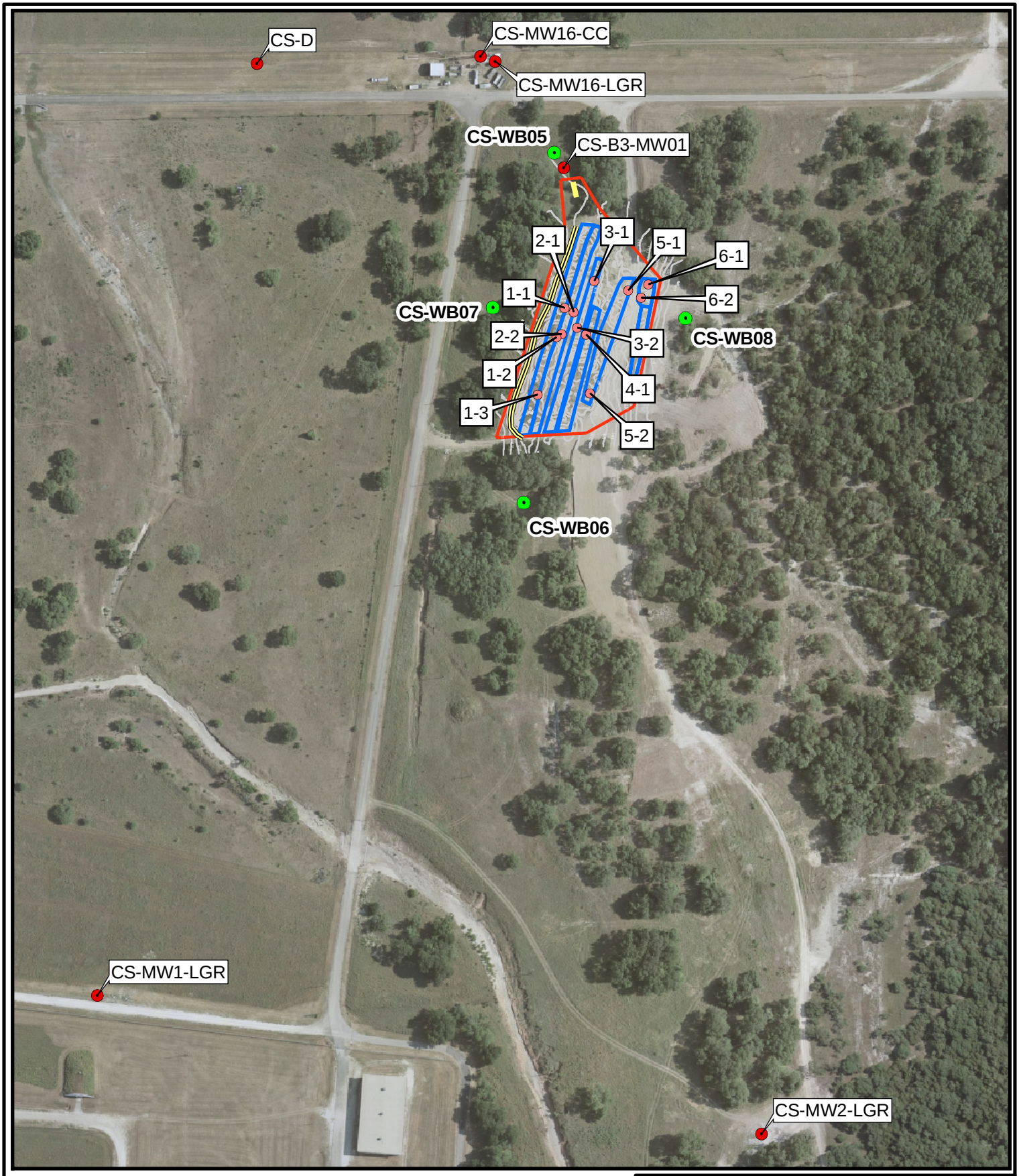

Figure 1

B-3 Bioreactor System
Camp Stanley Storage Activity

P a r s o n s

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Key for table/figure numbering	
First digit (Sample Event)	0 = Baseline 1 = Quarter 1 (or baseline through quarter 1) 2 = Quarter 2 3 = Quarter 3 4 = Quarter 4 5 = Quarter 5
Second digit (Well/Sump Sampled)	1 = Trench Sumps 2 = Westbay Wells 3 = Monitoring Wells 4 = Combination of Wells and Sumps 5 = Injection System
Third digit (Sampled for)	1 = Field Parameters 2 = VOC Analytical Data 3 = Other Analytical Data 4 = Microbial Data 5 = Applied Water Volume 6 = System Physical Parameters
Third digit qualifier (Westbay Identifier)	a = CS-WB05 b = CS-WB06 c = CS-WB07 d = CS-WB08

Table 0 **COC MCLs**

COC	MCL (mg/L)	MCL (µg/L)	Type
Arsenic	0.01	10	Metal
Manganese	0.05	50	
cis -Dichloroethene	0.07	70	Organic Compound
trans -Dichloroethene	0.1	100	
Trichloroethene	0.005	5	
Tetrachloroethene	0.005	5	
Vinyl Chloride	0.002	2	

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 1 Sump 1-1								
Sump Depth:		12.9 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	10.53	6.69	23.84	0.751	0.97	-197.7	2.37
5/5/2008	1017	7.70	6.65	23.82	0.843	0.84	-231.5	5.20
5/15/2008	830	6.29						6.61
5/20/2008	900	5.98						6.92
5/27/2008	1700	6.49	6.72	25.30	0.77	0.45	-216.0	6.41
5/29/2008	1345	6.57	6.73	24.28	0.697	0.49	-349.0	6.33
6/5/2008	1355	6.95	6.75	24.60	0.739	0.53	-303.8	5.95
6/12/2008	909	8.00	6.44	24.60	0.903	0.54	-263.6	4.90
6/16/2008	1345	7.47	6.55	24.66	0.572	0.47	-301.1	5.43
6/17/2008	1520	10.32						2.58
6/18/2008	1330	8.62	6.40	24.19	0.945	0.49	-295.3	4.28
6/20/2008	850	8.24						4.66
6/24/2008	1448	8.42	6.42	24.71	0.961	1.45	-266.4	4.48
7/1/2008	850	10.65	6.35	25.09	0.954	0.66	-245.9	2.25
7/9/2008	945	8.69	6.47	25.15	0.945	0.66	-278.9	4.21
7/16/2008	1040	9.50	6.30	25.27	0.927	0.79	-291.9	3.40
7/22/2008	900	10.21	6.41	25.57	0.952	0.66	-306.2	2.69
7/30/2008	900	11.40	6.42	25.40	1.006	0.69	-297.0	1.50

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 1 Sump 1-2								
Sump Depth:		12.4 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	10.15	6.79	23.51	0.697	0.54	-203.6	2.25
5/5/2008	1017	7.36	6.70	24.15	0.866	0.59	-223.7	5.04
5/15/2008	830	5.93						6.47
5/20/2008	900	5.63						6.77
5/27/2008	1700	6.18	6.70	25.30	0.780	0.40	-210	6.22
5/29/2008	1345	6.22	6.72	24.58	0.774	0.34	-290.9	6.18
6/5/2008	1355	6.58	6.64	25.06	0.734	0.37	-288.5	5.82
6/12/2008	909	7.77	6.53	24.59	0.800	0.44	-254.8	4.63
6/16/2008	1345	7.13	6.57	24.63	0.542	0.41	-286.5	5.27
6/17/2008	1530	9.91						2.49
6/18/2008	1330	8.32	6.67	24.89	0.709	0.38	-292.3	4.08
6/20/2008	850	7.90						4.50
6/24/2008	1448	8.11	6.55	24.57	0.839	7.55	-274.6	4.29
7/1/2008	850	10.15	6.51	24.87	0.848	0.53	-266.9	2.25
7/9/2008	945	8.38	6.60	24.46	0.906	0.60	-279.3	4.02
7/16/2008	1040	9.09	6.37	25.19	0.863	0.58	-289.6	3.31
7/22/2008	1015	9.68	6.47	25.27	0.939	0.46	-302.1	2.72
7/30/2008	900	11.00	6.50	25.65	1.012	0.52	-270.5	1.40

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 1 Sump 1-3								
Sump Depth:		12.85 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	9.64	6.78	23.86	0.649	0.43	-179.8	3.21
5/5/2008	1017	7.07	6.73	24.17	0.724	0.44	-182.7	5.78
5/15/2008	830	5.74						7.11
5/20/2008	900	5.49						7.36
5/27/2008	1700	6.09	6.84	25.10	0.740	0.36	-198.0	6.76
5/29/2008	1345	6.15	6.81	24.65	0.657	0.34	-279.3	6.70
6/5/2008	1355	6.53	6.82	24.97	0.655	0.30	-286.1	6.32
6/12/2008	909	7.53	6.65	24.94	0.651	0.33	-240.6	5.32
6/16/2008	1345	7.2	6.74	24.97	0.430	0.36	-258.2	5.65
6/17/2008	1535	9.42						3.43
6/18/2008	1330	8.4	6.60	25.01	0.686	0.38	-271.4	4.45
6/20/2008	850	7.82						5.03
6/24/2008	1448	8.2	6.47	25.42	0.766	3.40	-252.3	4.65
7/1/2008	850	10.03	6.47	25.44	0.723	0.53	-236.1	2.82
7/9/2008	945	8.21	6.53	25.20	0.821	0.57	-266.8	4.64
7/16/2008	1040	8.92	6.32	25.68	0.753	0.56	-278.5	3.93
7/22/2008	940	9.62	6.50	25.84	0.836	0.64	-295.2	3.23
7/30/2008	900	10.69	6.55	25.76	0.873	0.45	-263.1	2.16

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 2 Sump 2-1								
Sump Depth:		9.67 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	9.12	6.61	26.48	1.188	0.80	-155.0	0.55
5/5/2008	1017	9.22						0.45
5/15/2008	830	7.76						1.91
5/20/2008	900	7.44						2.23
5/29/2008	1345	8.03	6.51	28.21	1.188	0.49	-194.2	1.64
6/5/2008	1355	8.42	6.55	29.25	1.186	0.52	-231.1	1.25
6/12/2008	909	9.12						0.55
6/18/2008	1330	9.18						0.49
6/24/2008	1448	9.61						0.06
7/1/2008	850	9.67						0.00
7/9/2008	945	9.15	6.52	32.61	1.162	0.73	-249.3	0.52
7/16/2008	1040	9.41						0.26
7/22/2008	1015	9.55						0.12
7/30/2008	900	9.16	6.55	32.98	1.192	0.53	-265.1	0.51

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 2 Sump 2-2								
Sump Depth:		10.01 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	9.13	6.76	26.26	1.767	0.47	-144.1	0.88
5/5/2008	1017	9.27	6.63	26.37	1.839	0.65	-147.9	0.74
5/15/2008	830	8.15						1.86
5/20/2008	900	7.76						2.25
5/29/2008	1345	8.36	6.59	27.98	1.685	0.4	-237.8	1.65
6/5/2008	1355	8.73	6.61	28.63	1.596	0.37	-179.3	1.28
6/12/2008	909	9.07	6.52	29.78	1.520	0.44	-208.5	0.94
6/18/2008	1330	9.23	6.54	30.28	1.496	0.44	-225.4	0.78
6/24/2008	1448	9.46						0.55
7/1/2008	850	9.64						0.37
7/9/2008	945	9.63						0.38
7/16/2008	1040	9.63						0.38
7/22/2008	1015	10.01						0.00
7/30/2008	900	9.60	6.64	31.41	1.260	0.42	-239.9	0.41

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 3 Sump 3-1								
Sump Depth:		9.96 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	9.13						0.83
5/5/2008	1017	9.14						0.82
5/15/2008	830	9.13						0.83
5/20/2008	900	9.14						0.82
5/29/2008	1345	9.11						0.85
6/5/2008	1355	9.07						0.89
6/12/2008	909	9.13						0.83
6/18/2008	1330	9.09	6.61	31.05	1.677	0.38	-223.9	0.87
6/24/2008	1448	9.11						0.85
7/1/2008	850	9.09						0.87
7/9/2008	945	9.03	6.61	33.62	1.667	0.63	-263.5	0.93
7/16/2008	1040	9.05						0.91
7/22/2008	1015	9.96						0.00
7/30/2008	900	9.96						0.00

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 3 Sump 3-2								
Sump Depth:		7.4 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	7.40						0.00
5/5/2008	1017	7.40						0.00
5/15/2008	830	7.40						0.00
5/20/2008	900	7.40						0.00
5/29/2008	1345	7.40						0.00
6/5/2008	1355	7.40						0.00
6/12/2008	909	7.40						0.00
6/18/2008	1330	7.40						0.00
6/24/2008	1448	7.40						0.00
7/1/2008	850	7.40						0.00
7/9/2008	945	7.40						0.00
7/16/2008	1040	7.40						0.00
7/22/2008	1015	7.40						0.00
7/30/2008	900	7.40						0.00

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 4 Sump 4-1								
Sump Depth:		6.32 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
5/1/2008	1030	6.32						0.00
5/5/2008	1017	6.32						0.00
5/15/2008	830	6.32						0.00
5/20/2008	900	6.32						0.00
5/29/2008	1345	6.32						0.00
6/5/2008	1355	6.32						0.00
6/12/2008	909	6.32						0.00
6/18/2008	1330	6.32						0.00
6/24/2008	1448	6.32						0.00
7/1/2008	850	6.32						0.00
7/9/2008	945	6.32						0.00
7/16/2008	1040	6.32						0.00
7/22/2008	1015	6.32						0.00
7/30/2008	900	6.32						0.00

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 5 Sump 5-1								
Sump Depth:		9.33 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
5/1/2008	1030	9.32						0.01
5/5/2008	1017	9.30						0.03
5/15/2008	830	9.30						0.03
5/20/2008	900	9.21						0.12
5/29/2008	1345	9.28						0.05
6/5/2008	1355	9.29						0.04
6/12/2008	909	9.33						0.00
6/18/2008	1330	9.25						0.08
6/24/2008	1448	9.33						0.00
7/1/2008	850	9.33						0.00
7/9/2008	945	9.25						0.08
7/16/2008	1040	9.33						0.00
7/22/2008	1015	9.33						0.00
7/30/2008	900	9.33						0.00

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 5 Sump 5-2								
Sump Depth:		7.98 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
5/1/2008	1030	7.82						0.16
5/5/2008	1017	7.81						0.17
5/15/2008	830	7.74						0.24
5/20/2008	900	7.76						0.22
5/29/2008	1345	7.78						0.20
6/5/2008	1355	7.78						0.20
6/12/2008	909	7.98						0.00
6/18/2008	1330	7.82						0.16
6/24/2008	1448	7.80						0.18
7/1/2008	850	7.98						0.00
7/9/2008	945	7.51						0.47
7/16/2008	1040	7.98						0.00
7/22/2008	1015	7.98						0.00
7/30/2008	900	7.98						0.00

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 6 Sump 6-1								
Sump Depth:		11.45 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
5/1/2008	1030	11.08						0.37
5/5/2008	1017	11.05						0.40
5/15/2008	830	11.06						0.39
5/20/2008	900	11.11						0.34
5/29/2008	1345	11.09						0.36
6/5/2008	1355	11.10						0.35
6/12/2008	909	11.45						0.00
6/18/2008	1330	11.45						0.00
6/24/2008	1448	11.11						0.34
7/1/2008	850	11.45						0.00
7/9/2008	945	11.08						0.37
7/16/2008	1040	11.45						0.00
7/22/2008	1015	11.45						0.00
7/30/2008	900	11.45						0.00
.								

NA = Not Available

Table 5.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 5

TRENCH 6 Sump 6-2								
Sump Depth:		12.34 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
5/1/2008	1030	11.95						0.39
5/5/2008	1017	11.95						0.39
5/15/2008	830	11.95						0.39
5/20/2008	900	11.97						0.37
5/29/2008	1345	11.98						0.36
6/5/2008	1355	11.96						0.38
6/12/2008	909	12.34						0.00
6/18/2008	1330	11.97						0.37
6/24/2008	1448	11.94						0.40
7/1/2008	850	12.34						0.00
7/9/2008	945	11.96						0.38
7/16/2008	1040	12.34						0.00
7/22/2008	1015	12.34						0.00
7/30/2008	900	12.34						0.00

NA = Not Available

Q5		Monitoring Wells									
Well ID		**CS-MW16-LGR**		**CS-MW1-LGR**		**CS-D**		**CS-B3-MWO1**		**CS-MW16-CC**	
Sample Date		**7/21/2008**		**7/21/2008**		**7/21/2008**		**7/21/2008**		**7/21/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.65		0.57		0.6		27.2		0.53	
Total Organic Carbon	mg/L	1		0.7		0.72		35.8		0.87	
Methane	µg/L	16.5		0		0.0		39,500		5.1	
Ethene	µg/L	0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0	
Carbon Dioxide	µg/L	35,000		28,800		35,400		568,000		25,600	
Alkalinity, Total (as CACO3)	mg/L	260		261		315		1590		264	
Nitrate/Nitrite	mg/L	1.1		0.8		1		0.034	J	0	
Sulfate	mg/L	18.4		13.6		17		0		55	
Chloride	mg/L	10.5		8.9		10.2		14.7		15.3	
Ferrous Iron	mg/L	0		0		0		5.1		0.16	J
Manganese	µg/L	0		3.8	J	0		74.3		0	
Hydrogen	nM										
Hydrogen Sulfide											
Total Dissolved Solids	mg/L	324		302		315		1900		375	
Benzene	µg/L	0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0	
Chloroform	µg/L	0.16	J	0		0.16	J	0		0	
Dibromochloromethane	µg/L	0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0.0		0.0		0.4	J
Dichloroethene, cis-1,2-	µg/L	150		17		130		140		68	
Dichloroethene, trans-1,2-	µg/L	0.54	J	0		1.7		0.59	J	2.5	
Methylene chloride	µg/L	0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0	
Tetrachloroethene	µg/L	170		19		140		0		11	
Toluene	µg/L	0		0		0		0		0	
Trichloroethene	µg/L	170		27		170		0.33	J	73	
Vinyl chloride	µg/L	0		0		0		4.2		0.34	J
Arsenic	µg/L	0		0		0		0		0	
Barium	µg/L	35.2		32		30.8		171		23.2	
Cadmium	µg/L	0		0		0		0		0	
Chromium	µg/L	0		13.8		0		1.8	J	0	
Copper	µg/L	10		2.1	J	1.1	J	2.2	J	2.5	J
Lead	µg/L	4.1	J	0		2.3	J	9.7		2.8	J
Mercury	µg/L	0.16	J	0.13	J	0.12	J	0.088	J	0.13	J
Nickel	µg/L	0.0		9.0		0.0		11.3		3.3	J
Zinc	µg/L	121		67.6		9	J	151		21	J
		Quarter 5 - Month 15		Quarter 5 - Month 15		Quarter 5 - Month 15		Quarter 5 - Month 15		Quarter 5 - Month 15	

Note : 0 sample value indicates a non-detect analyte value

Table 5.2.3d SWMU B-3 Bioreactor Multi-port Well CS-WB08 - Q5 Performance Data

Q5		WB08											
Well ID		**CS-WB08-LGR01**		**CS-WB08-LGR02**		**CS-WB08-LGR03B**						**CS-WB08-LGR04**	
Sample Date		**7/28/2008**		**7/24/2008**		**5/19/2008**		**6/18/2008**		**7/23/2008**		**7/24/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	1.2	B	0.92						0.67		2.5	
Total Organic Carbon	mg/L	1.4	B	1						0.88		2.1	
Methane	µg/L	0		2.98						0		0	
Ethene	µg/L	0		0						0		0	
Ethane	µg/L	0		0						0		0	
Carbon Dioxide	µg/L	35,600		40,200						9,010		49,500	
Alkalinity, Total (as CACO3)	mg/L	316		317						264		415	
Nitrate/Nitrite	mg/L	0		0						0.6		0	
Sulfate	mg/L	89.1		97						17.8		4.9	
Chloride	mg/L	10		11.2						11.1		15	
Ferrous Iron	mg/L	0.16	J	0						0		0	
Manganese	µg/L	3.9	J	3.1	J					2.9	J	5.7	
Hydrogen	nM												
Hydrogen Sulfide													
Total Dissolved Solids	mg/L	472		523		338		334		344		508	
Benzene	µg/L	0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0	
Chloroform	µg/L	0		0		0.28	JB	0.19	J	0.18	J	0	
Dibromochloromethane	µg/L	0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	22		12		320		240		160		43	
Dichloroethene, trans-1,2-	µg/L	1.1		0		2.2		7.3		2.7		5	
Methylene chloride	µg/L	0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0	
Tetrachloroethene	µg/L	2		0		270		140		86		4.1	
Toluene	µg/L	0		0		0		0		0		0	
Trichloroethene	µg/L	6.2		0		310		190		130		4.3	
Vinyl chloride	µg/L	0		0.0		0		0		0		0.00	
Arsenic	µg/L	0		0						0		0	
Barium	µg/L	107		60.5						31.8		54.9	
Cadmium	µg/L	0		0						0		0	
Chromium	µg/L	3.5	J	4.4	J					0		0	
Copper	µg/L	0		0						0		0	
Lead	µg/L	0		2.7	J					2.5	J	5.8	
Mercury	µg/L	0		0.075	J					0.075	J	0.1	J
Nickel	µg/L	0		0.82	J					6.4		0	
Zinc	µg/L	0		0						36.6	J	0	
		Q5 - Month 15		Q5 - Month 15		Month 13		Month 14		Month 15		Q5 - Month 15	

Note: 0 sample value indicates a non-detect analyte value

Table 5.2.3c SWMU B-3 Bioreactor Multi-port Well CS-WB07 - Q5 Performance Data

Q5		WB07													
Well ID		**CS-WB07-LGR01**		**CS-WB07-LGR-02**		**CS-WB07-LGR-03A**		**CS-WB07-LGR-03B**						**CS-WB07-LGR-04**	
Sample Date		**7/31/2008**		**7/31/2008**		**7/31/2008**		**5/19/2008**		**6/17/2008**		**7/23/2008**		**7/30/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	1.2	B	1.1	B	1.1	B	0.78		0.14	J	0.85		0.94	B
Total Organic Carbon	mg/L	2	B	1.1	B	1.6	B	0.29	J	0.57		0.9		1.3	B
Methane	µg/L	0		1.46		6.95		25.6		17.8		24.5		1.22	
Ethene	µg/L	0		0		0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	22,100		24,600		25,400		37,700		27,700		32,300		22,200	
Alkalinity, Total (as CACO3)	mg/L	393		291		293		262		314		287		270	
Nitrate/Nitrite	mg/L	0		0		0		0		0		0		0.83	
Sulfate	mg/L	95.8		36.6		20.1		20.4		20.1		20.3		9.9	
Chloride	mg/L	17.1		13.3		10		10		10.6		10		11.9	
Ferrous Iron	mg/L	0		0		0		0.25	J	0		0		0	
Manganese	µg/L	0		0		1.5	J	0		0		2.1	J	0	
Hydrogen	nM														
Hydrogen Sulfide															
Total Dissolved Solids	mg/L	576		379		336		334		328		333		326	
Benzene	µg/L	0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0.13	J
Dibromochloromethane	µg/L	0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	3		0		17		30		24		32		160	
Dichloroethene, trans-1,2-	µg/L	0.28	J	0		0.39	J	0.62		1.5		0.78		2.6	
Methylene chloride	µg/L	0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.7	J	0		1.1	J	0		0		0		130	
Toluene	µg/L	0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.5		0.16	J	2.4		2.8		2.5		4		120	
Vinyl chloride	µg/L	0		0		0		0		0		0		0.46	J
Arsenic	µg/L	0		0		0		0		0		0		0	
Barium	µg/L	79.4		98.1		31.9		35.7		34.4		32.7		25.5	
Cadmium	µg/L	0		0		0		0		0		0		0.9	J
Chromium	µg/L	5.6		5		15.5		0		1.6	J	2.6	J	3.4	J
Copper	µg/L	0		0		0		1.7	J	0		0		0	
Lead	µg/L	0		0		0		0		0		2.5	J	0	
Mercury	µg/L	0.078	J	0.15	J	0.14	J	0.58		0.51		0		0.13	J
Nickel	µg/L	8.2		2.6	J	10		1.4	J	1.8	J	0.73	J	2.6	J
Zinc	µg/L	11.4	J	6.7	J	7.8	J	0		0		0		11.6	J
		Q5 - Month 15		Q5 - Month 15		Q5 - Month 15		Month 13		Month 14		Month 15		Q5 - Month 15	

Note: 0 sample value indicates a non-detect analyte value

Table 5.2.3b SWMU B-3 Bioreactor Multi-port Well CS-WB06 - Q5 Performance Data

Q5		WB06															
Well ID		**CS-WB06-UGR01**		**CS-WB06-LGR01**		**CS-WB06-LGR02**		**CS-WB06-LGR03A**		**CS-WB06-LGR03B**						**CS-WB06-LGR04**	
Sample Date		**7/30/2008**		**7/30/2008**		**7/28/2008**		**7/28/2008**		**5/19/2008**		**6/17/2008**		**7/23/2008**		**7/28/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	2.8	B	1.6	B	2.4	B	1.8	B					0.9		1.1	B
Total Organic Carbon	mg/L	2.7	B	1.4	B	2.9	B	1.6	B					1		1.2	B
Methane	µg/L	1110		0		0		1.95						2.16		0	
Ethene	µg/L	0		0		0		0						0		0	
Ethane	µg/L	0		0		0		0						0		0	
Carbon Dioxide	µg/L	133,000		10,300		8,800		9,620						7,680		23,200	
Alkalinity, Total (as CACO3)	mg/L	468		374		277		273						283		261	
Nitrate/Nitrite	mg/L	0.18		0		0.1		0.14						0.062	J	1.1	
Sulfate	mg/L	7.1		24		26.6		21.7						22		10.4	
Chloride	mg/L	15.2		13.2		10.5		11.9						12.2		12.8	
Ferrous Iron	mg/L	0		0		0		0						0		0	
Manganese	µg/L	986		10		4.3	J	2.4	J					2.4	J	4.7	J
Hydrogen	nM																
Hydrogen Sulfide																	
Total Dissolved Solids	mg/L	521		436		346		354		356		341		317		334	
Benzene	µg/L	0		0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0	J
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0.34	J	0		0		0	
Dichloroethene, cis-1,2-	µg/L	4.9		40		41		130		200		160		160		300	
Dichloroethene, trans-1,2-	µg/L	15		1.8		2.2		1.1		2.4		1.2		1.6		12	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.48	J	8.6		13		39		120		44		51		190	
Toluene	µg/L	0		0.17	J	0.17	J	0.25	J	0.29	J	0.24	J	0.2	J	0	
Trichloroethene	µg/L	0.46	J	11		16		51		130		73		79		160	
Vinyl chloride	µg/L	53	J	0.73	J	0		0		0.24	J	0		0		0	
Arsenic	µg/L	0		3.7	J	0		0						0		0	
Barium	µg/L	82.2		90.9		55.7		0						28		27.6	
Cadmium	µg/L	1.8	J	0		0		0						0		0	
Chromium	µg/L	4.6	J	2.7	J	12.7		0						0		10.2	
Copper	µg/L	0		0		0		0						0		1.4	J
Lead	µg/L	0		0		2.1	J	7.2						4	J	2.5	J
Mercury	µg/L	0.15	J	0.13	J	0		0.083	J					0		0	
Nickel	µg/L	26.8		3.5	J	9.6		0						2.8	J	4.8	J
Zinc	µg/L	7.6	J	5.2	J	26.5	J	0						9.2	J	4.1	J
		Q5 - Month 15		Q5 - Month 15		Q5 - Month 15		Q5 - Month 15		Month 13		Month 14		Month 15		Q5 - Month 15	

Note: 0 sample value indicates a non-detect analyte value

Table 5.2.3a SWMU B-3 Bioreactor Multi-port Well CS-WB05 - Q5 Performance Data

Q5		WB05															
Well ID		**CS-WB05-LGR01**		**CS-WB05-LGR03B**						**CS-WB05-LGR04B**		**CS-WB05-BS-01**		**CS-WB05-CC-01**		**CS-WB05-CC-02**	
Sample Date		**7/22/2008**		**5/19/2008**		**6/17/2008**		**7/23/2008**		**7/22/2008**		**7/21/2008**		**7/21/2008**		**7/21/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.80		0.92		0		0		1.4		0.84		0		0.8	
Total Organic Carbon	mg/L	0.94		0.25	J	0.63		0.94		0		0.81		1.4		0.68	
Methane	µg/L	8.82		9.3		8.33		2.31		38,200		22.8		4.31		6.39	
Ethene	µg/L	0		0		0		0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	42,300		21,900		32,400		42,500		453,000		25,400		12,000		8,510	
Alkalinity, Total (as CACO3)	mg/L	415		319		323		289		429		270		263		268	
Nitrate/Nitrite	mg/L	0		0		0		0		0.17		0		0		0	
Sulfate	mg/L	94.3		49.5		47		47.3		4.2		31.9		82		81.1	
Chloride	mg/L	13.6		10.8		11.1		10.5		12.3		11.6		16.9		17.1	
Ferrous Iron	mg/L	0		0.23	J	0		0		0		0		0		0.33	J
Manganese	µg/L	1.4	J	1.4	J	0		3.8	J	34.8		0		366		0	
Hydrogen	nM																
Hydrogen Sulfide																	
Total Dissolved Solids	mg/L	512		396		389		370		465		333		402		423	
Benzene	µg/L	0		0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0.097	J	0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0.61	J	0		0		0.51	J
Dichloroethene, cis-1,2-	µg/L	0.85	J	55		45		45		650		18		23		120	
Dichloroethene, trans-1,2-	µg/L	0		2.1		3.9		1.6		1.4		0.4	J	0.25	J	1.1	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	1	J	0.26	J	2.9		8.2		130		0.49	J	34		25	
Toluene	µg/L	0		0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.4		61		58		46		130		12		36		170	
Vinyl chloride	µg/L	0		0		0		0		2.3		0		0		0	
Arsenic	µg/L	0		4.3	J	0		0		0		0		0		0	
Barium	µg/L	23.6		33.3		31.3		28		30.4		25.7		150		21	
Cadmium	µg/L	0		0		0		0		1	J	0		0		0	
Chromium	µg/L	2.4	J	0		1.5	J	1.5	J	2.2	J	1.8	J	1.9	J	0	
Copper	µg/L	0		3	J	1.4	J	0		0		0		1.8	J	1	J
Lead	µg/L	3.4	J	0		0		3	J	0		3.6	J	2.7	J	1.9	J
Mercury	µg/L	0		0.54		0.55		0		0		0.06	J	0.13	J	0.17	J
Nickel	µg/L	5.5		7.9		7.7		5.6		35.1		0		0.94	J	0	
Zinc	µg/L	10.6	J	9.7	J	14.5	J	40.3	J	8	J	6.2	J	14.4	J	13.9	J
		Q45- Month 15		Month 13		Month 14		Month 15		Q5 - Month 15		Q5 - Month 15		Q45- Month 15		Q5 - Month 15	

Note: 0 sample value indicates a non-detect analyte value

Note: Dry zones including LGR02, LGR03A, and LGR04A were not sampled during the quarterly sampling event.

Q5		B3																	
Well ID		**B3 T1-1**						**B3 T1-2**						**B3 T1-3**					
Sample Date		**5/20/2008**		**6/16/2008**		**7/22/2008**		**5/20/2008**		**6/16/2008**		**7/22/2008**		**5/20/2008**		**6/16/2008**		**7/22/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	4.2		1.7		2.9		8.1		2.9		2.6		15.1		2.7		2.5	
Total Organic Carbon	mg/L	3.6		2.3		4.6		8.3		3.9		3.8		15.4		3.5		3.7	
Methane	µg/L	3,130		1,630		11,100		758		2,020		9,400		2,320		2,630		5,850	
Ethene	µg/L	0		0		1.69		0		3.18		7.75		0		2.16		7.11	
Ethane	µg/L	0		0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	152,000		85,100		470,000		68,700		160,000		328,000		119,000		78,400		245,000	
Alkalinity, Total (as CACO3)	mg/L	371		372		495		360		391		451		369		359		443	
Nitrate/Nitrite	mg/L	0		0		0		0		0.15		0		0		0		0	
Sulfate	mg/L	14.2		2.2		2.1		13.7		19.7		4.7		16.7		4.9		3.3	
Chloride	mg/L	13.6		14		14.3		13.2		15.8		13.9		13.3		13.5		13.9	
Ferrous Iron	mg/L	5.9		4		3.7		5.1		3.4		3.5		3.5		3		4.4	
Manganese	µg/L	295		202		244		574		276		391		826		389		550	
Hydrogen	nM/L			5						2.8		5.5				4.4			
Hydrogen Sulfide																			
Total Dissolved Solids	mg/L	408		409		540		409		453		510		447		359		464	
Benzene	µg/L	0		0		0		---		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		---		0		0		0		0		0	
Bromoform	µg/L	0		0		0		---		0		0		0		0		0	
Chloroform	µg/L	0		0		0.15	J	---		0		0.18	J	0		0		0.16	J
Dibromochloromethane	µg/L	0		0		0		---		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		---		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		---		0		0		0.31	J	0		0	
Dichloroethene, cis-1,2-	µg/L	24		0.78	J	0.26	J	30.0		1.6		0.28	J	91		9.8		0.45	J
Dichloroethene, trans-1,2-	µg/L	8.8		12		12		---		8.0		13		0.7		29		39	
Methylene chloride	µg/L	0		0		0		---		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		---		0		0		0		0		0	
Tetrachloroethene	µg/L	1.2	J	0		0		1.0	J	0		0		13		0.36	J	0	
Toluene	µg/L	2.7		1.2		7		---		0.55	J	3.6		0.17	J	0.82	J	3.8	
Trichloroethene	µg/L	12		0		0		9.0		0.29	J	0		35		2.5		0	
Vinyl chloride	µg/L	70		130		23		30.0		51		7.4		1.6		100		28	
Arsenic	µg/L	0		0		0		7.6		0		0		10.9		0		0	
Barium	µg/L	85.7		92.5		116		94.8		124		160		111		93.1		137	
Cadmium	µg/L	0		0		0		0		0		0		0		0		0	
Chromium	µg/L	0		0		1.5	J	0		0		1.9	J	0		0		1.8	J
Copper	µg/L	0		2.9	J	0		1.5	J	0		1.6	J	1.8	J	0		0	
Lead	µg/L	1.7	J	1.9	J	0		2.5	J	0		1.7	J	4.6	J	0		3	J
Mercury	µg/L	0		0.64		0		0		0.63		0		0		0.56		0	
Nickel	µg/L	0		0.56	J	1.1	J	0.69	J	0	J	1	J	1.5	J	0		0	
Zinc	µg/L	0		0		8	J	0.0		0		11	J	54.6		4.8	J	10.4	J
		Month 13		Month 14		Month 15		Month 13		Month 14		Month 15		Month 13		Month 14		Month 15	

Note: 0 sample indicates a non-detect analyte value

Q5	B3 T1-1			B3 T1-2			B3 T1-3		
Date	**5/20/08**	**6/16/08**	**7/22/08**	**5/20/08**	**6/16/08**	**7/22/08**	**5/20/08**	**6/16/08**	**7/22/08**
PCE (µg/L)	1.2	0	0	1	0	0	13	0.36	0
TCE (µg/L)	12	0	0	9	0.29	0	35	2.5	0
cis-1,2-DCE (µg/L)	24	0.78	0.26	30	1.6	0.28	91	9.8	0.45
trans-1,2-DCE (µg/L)	8.8	12	12		8	13	0.7	29	39
Vinyl Chloride (µg/L)	70	130	23	30	51	7.4	1.6	100	28
Ethene (µg/L)	0	0	1.69	0	3.18	7.75	0	2.16	7.11
PCE (nM/L)	7.236	0.000	0.000	6.030	0.000	0.000	78.394	2.171	0.000
TCE (nM/L)	91.331	0.000	0.000	68.498	2.207	0.000	266.383	19.027	0.000
cis-1,2-DCE (nM/L)	247.550	8.045	2.682	309.438	16.503	2.888	938.628	101.083	4.642
trans-1,2-DCE (nM/L)	90.768	123.775	123.775	0.000	82.517	134.090	7.220	299.123	402.269
Vinyl Chloride (nM/L)	1119.821	2079.667	367.941	479.923	815.869	118.381	25.596	1599.744	447.928
Ethene (nM/L)	0.000	0.000	60.250	0.000	113.369	276.292	0.000	77.005	253.476
Total Molar Conc. (nM/L)	1,556.707	2,211.488	554.648	863.890	1,030.466	531.651	1,316.220	2,098.154	1,108.315
% moles PCE	0.465%	0.000%	0.000%	0.698%	0.000%	0.000%	5.956%	0.103%	0.000%
% moles TCE	5.867%	0.000%	0.000%	7.929%	0.214%	0.000%	20.238%	0.907%	0.000%
% moles cis-1,2-DCE	15.902%	0.364%	0.484%	35.819%	1.602%	0.543%	71.312%	4.818%	0.419%
% moles trans-1,2-DCE	5.831%	5.597%	22.316%	0.000%	8.008%	25.221%	0.549%	14.256%	36.296%
% moles Vinyl Chloride	71.935%	94.039%	66.338%	55.554%	79.175%	22.267%	1.945%	76.245%	40.415%
% moles Ethene	0.000%	0.000%	10.863%	0.000%	11.002%	51.969%	0.000%	3.670%	22.870%
sum % moles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Month 13	Month 14	Month 15	Month 13	Month 14	Month 15	Month 13	Month 14	Month 15

Note: 0 sample indicates a non-detect analyte value

Monitoring Wells

Baseline - Q3		CS B-3 MW01				CS-MW 16-LGR			CS-MW16-CC
	Sample date:	12/19/2006	8/3/2007	10/15/2007	7/22/2008	12/19/2006	8/3/2007	10/17/2007	10/17/2007
Dechlorinating Bacteria	units								
Dehalococcoides spp (1)	(cells/mL)	2.37E+01	4.50E-01	1.17E+00	4.25E-01 (J)	6.90E+01	1.31E-01	3.67E-01	5.93E-01
Functional Genes	units								
TCE R-Dase (1)	(cells/mL)	<1.11E+00	<2.5E-01	5.68E-01 (J)	<1E+00	<2.5E-01	<5E-01	<2.5E-01	<2.5E-01
BAV1 VC R-Dase (1)	(cells/mL)	<1.11E+00	<2.5E-01	1.20E+00	<1E+00	<2.5E-01	<5E-01	<2.5E-01	<2.5E-01
VC R-Dase	(cells/mL)	<1.11E+00	<2.5E-01	3.31E+01	<1E+00	<2.5E-01	<5E-01	2.47E+00	1.10E+00

Trench Sump	Sample date:	12/19/2006	8/3/2007	8/23/2007	9/17/2007	10/17/2007	11/19/2007	12/18/2007	1/25/2008	2/20/2008	3/26/2008	4/22/2008	5/21/2008	6/16/2008	7/22/2008
B3 T1-1															
Dechlorinating Bacteria	units														
Dehalococcoides spp (1)	(cells/mL)									5.01E+04	6.03E+03	8.78E+03			
Functional Genes	units														
TCE R-Dase (1)	(cells/mL)									2.89E+04	1.83E+03	3.02E+03			
BAV1 VC R-Dase (1)	(cells/mL)									8.49E+00	<5E-01	1.66E-01 (J)			
VC R-Dase	(cells/mL)									4.50E+05	1.17E+04	2.81E+03			
B3 T1-2															
Dechlorinating Bacteria	units														
Dehalococcoides spp (1)	(cells/mL)					1.68E+04	2.30E+04	1.99E+03	2.75E+02	2.09E+04	9.03E+04	4.32E+03	5.23E+03	1.85E+04	1.15E+04
Functional Genes	units														
TCE R-Dase (1)	(cells/mL)					3.71E+03	7.56E+02	2.06E+03	2.32E+02	9.26E+02	4.36E+04	1.79E+03	3.00E+03	9.68E+03	6.67E+03
BAV1 VC R-Dase (1)	(cells/mL)					<2.5E-01	<2.5E-01	<2.5E-01	<5E+00	2.32E+00	3.94E-01 (J)	<5E-01 (J)	2.42E-01 (J)	<5E-01	<2.5E-01
VC R-Dase	(cells/mL)					<2.5E-01	<2.5E-01	3.08E+00	3.40E+02	3.54E+05	2.42E+04	3.45E+02	5.44E+03	1.85E+04	7.17E+03
B3 T1-3															
Dechlorinating Bacteria	units														
Dehalococcoides spp (1)	(cells/mL)	2.46E+03	7.62E+00	7.27E+01	4.75E+00				2.15E+03	1.62E+02	7.07E+04	2.46E+04	1.78E+02	6.42E+03	
Functional Genes	units														
TCE R-Dase (1)	(cells/mL)	<1E+00	<4.55E-01	2.87E+00	4.73E-01 (J)				2.32E+02	5.23E+01	2.75E+04	1.74E+04	2.97E+01	2.14E+03	
BAV1 VC R-Dase (1)	(cells/mL)	<1E+00	<4.55E-01	<5E-01	<5E-01				<1E+00	<8.33E-01	<9.35E-01	<3.33E-01	1.87E+00	<5E-01	
VC R-Dase	(cells/mL)	<1E+00	<4.55E-01	<5E-01	<5E-01				5.89E+01	7.43E+02	6.43E+04	6.13E+02	1.36E+02	5.06E+03	
B3 T2-1															
Dechlorinating Bacteria	units														
Dehalococcoides spp (1)	(cells/mL)										4.93E+02				
Functional Genes	units														
TCE R-Dase (1)	(cells/mL)										6.08E+01				
BAV1 VC R-Dase (1)	(cells/mL)										<5E-01				
VC R-Dase	(cells/mL)										3.93E+01				
B3 T2-2															
Dechlorinating Bacteria	units														
Dehalococcoides spp (1)	(cells/mL)										2.21E+02				
Functional Genes	units														
TCE R-Dase (1)	(cells/mL)										5.82E+00				
BAV1 VC R-Dase (1)	(cells/mL)										<8.7E-01				
VC R-Dase	(cells/mL)										1.47E+01				
B3 T6-1															
Dechlorinating Bacteria	units														
Dehalococcoides spp (1)	(cells/mL)		1.45E+02												
Functional Genes	units														
TCE R-Dase (1)	(cells/mL)		<9.09E-01												
BAV1 VC R-Dase (1)	(cells/mL)		<9.09E-01												
VC R-Dase	(cells/mL)		<9.09E-01												

Graphs

Figure 5.1.2T1-1 B-3 Bioreactor Trench 1 Sump 1 VOC Summary through Quarter 5

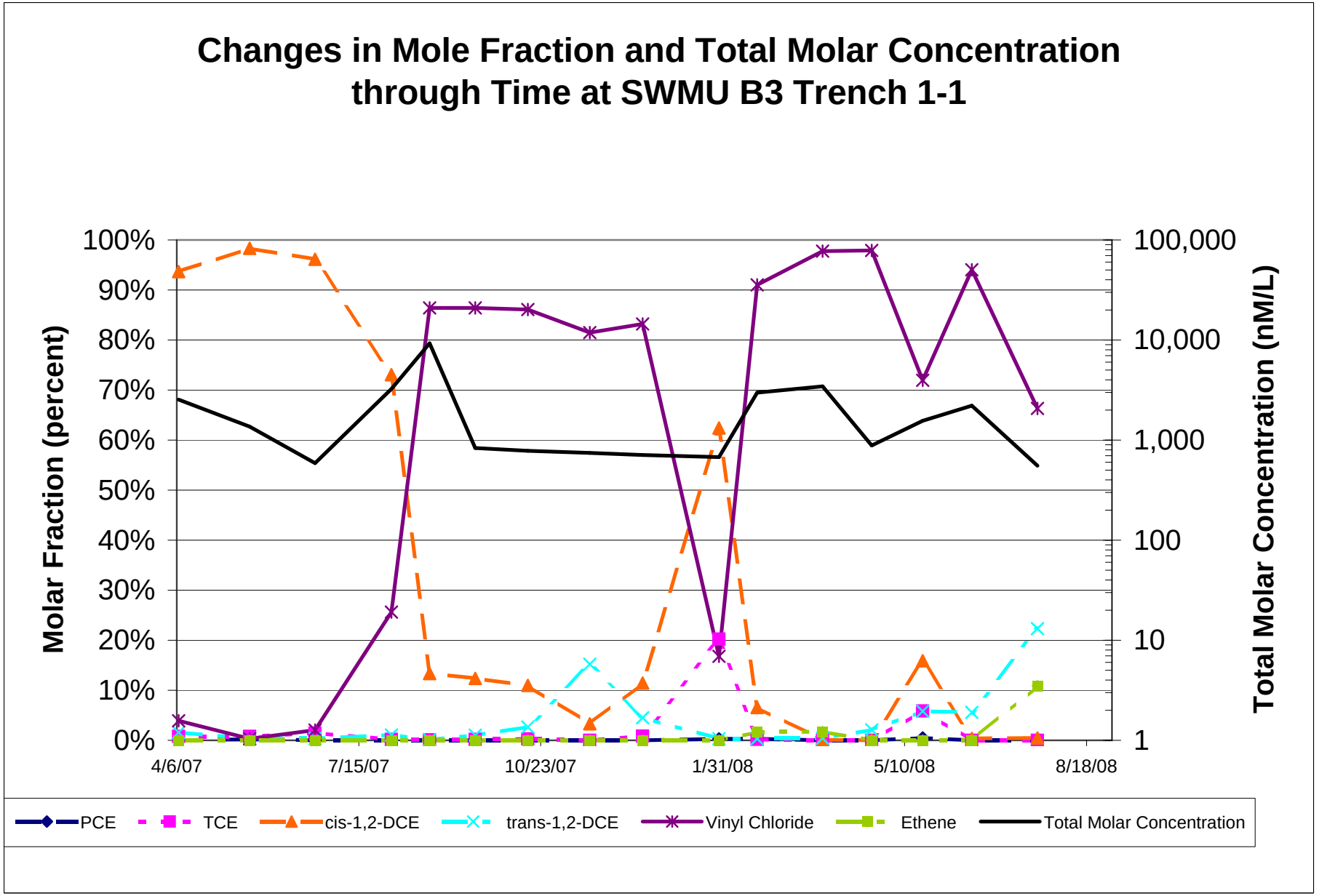

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Figure 5.1.2T1-3 B-3 Bioreactor Trench 1 Sump 3 VOC Summary through Quarter 5

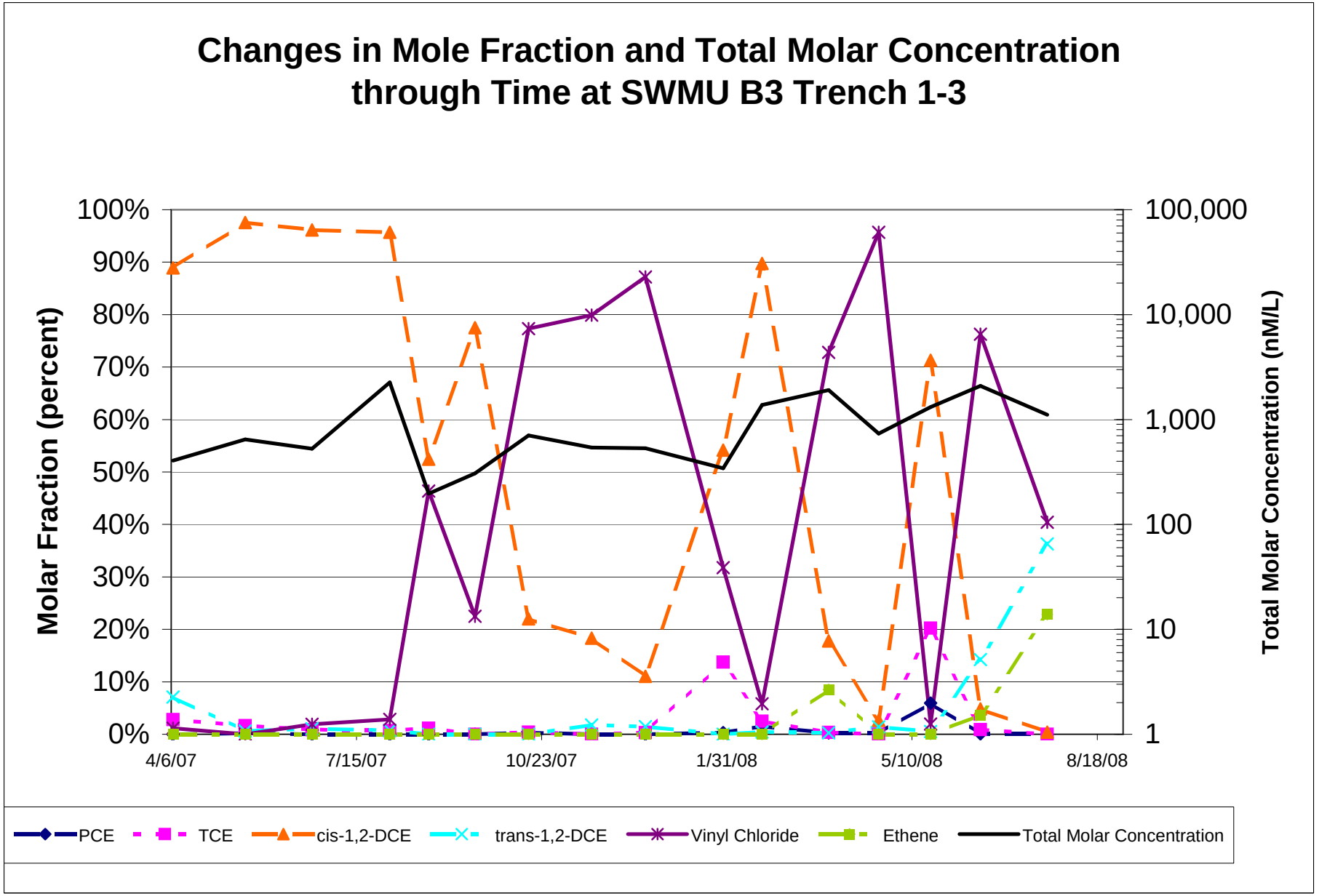

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Figure 5.1.2T1-2 B-3 Bioreactor Trench 1 Sump 2 VOC Summary through Quarter 5

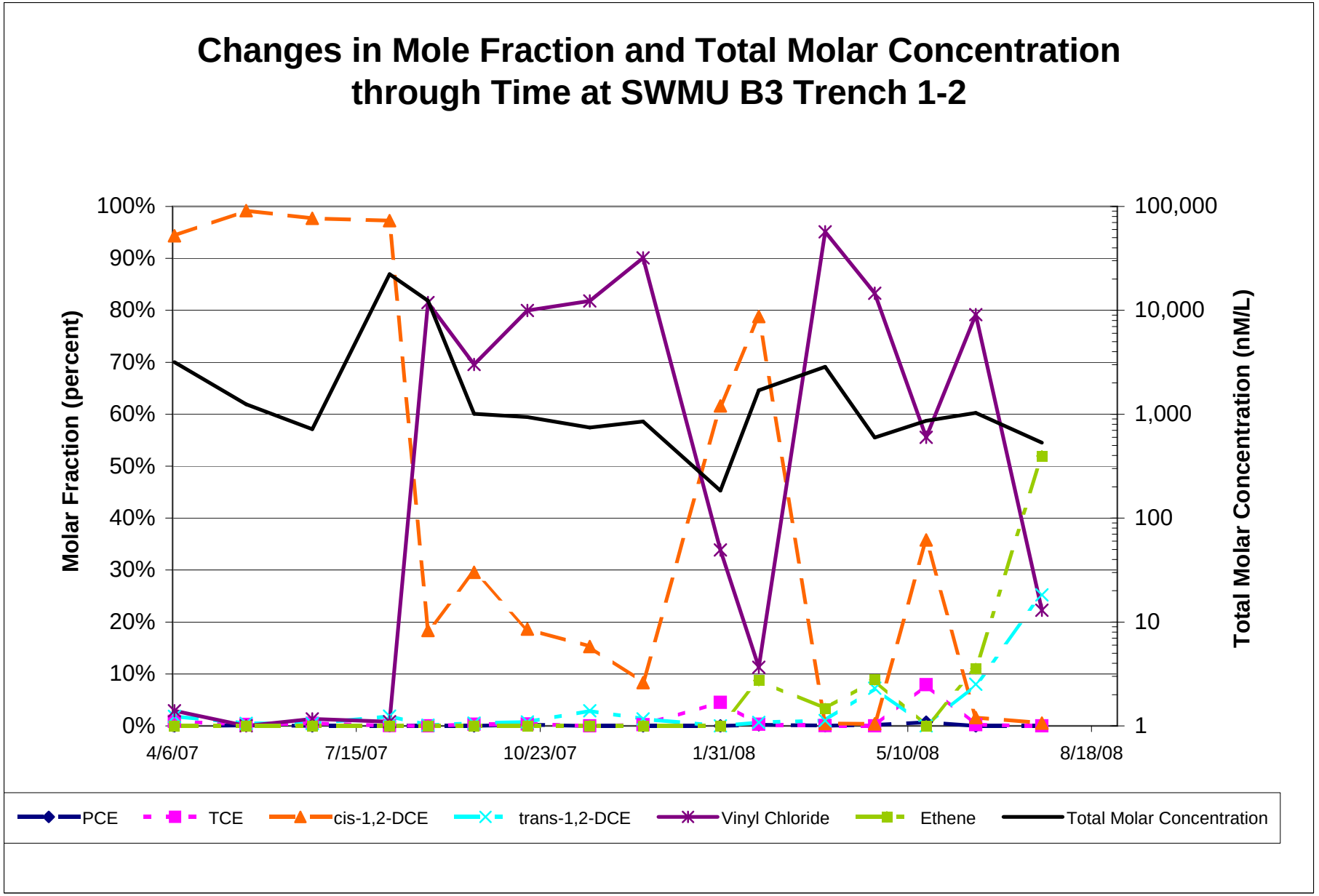

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Figure 5.5.6

SWMU B-3 Bioreactor - Trench 1
Average Water Thickness, CS-16 Water Application, and Daily Precipitation

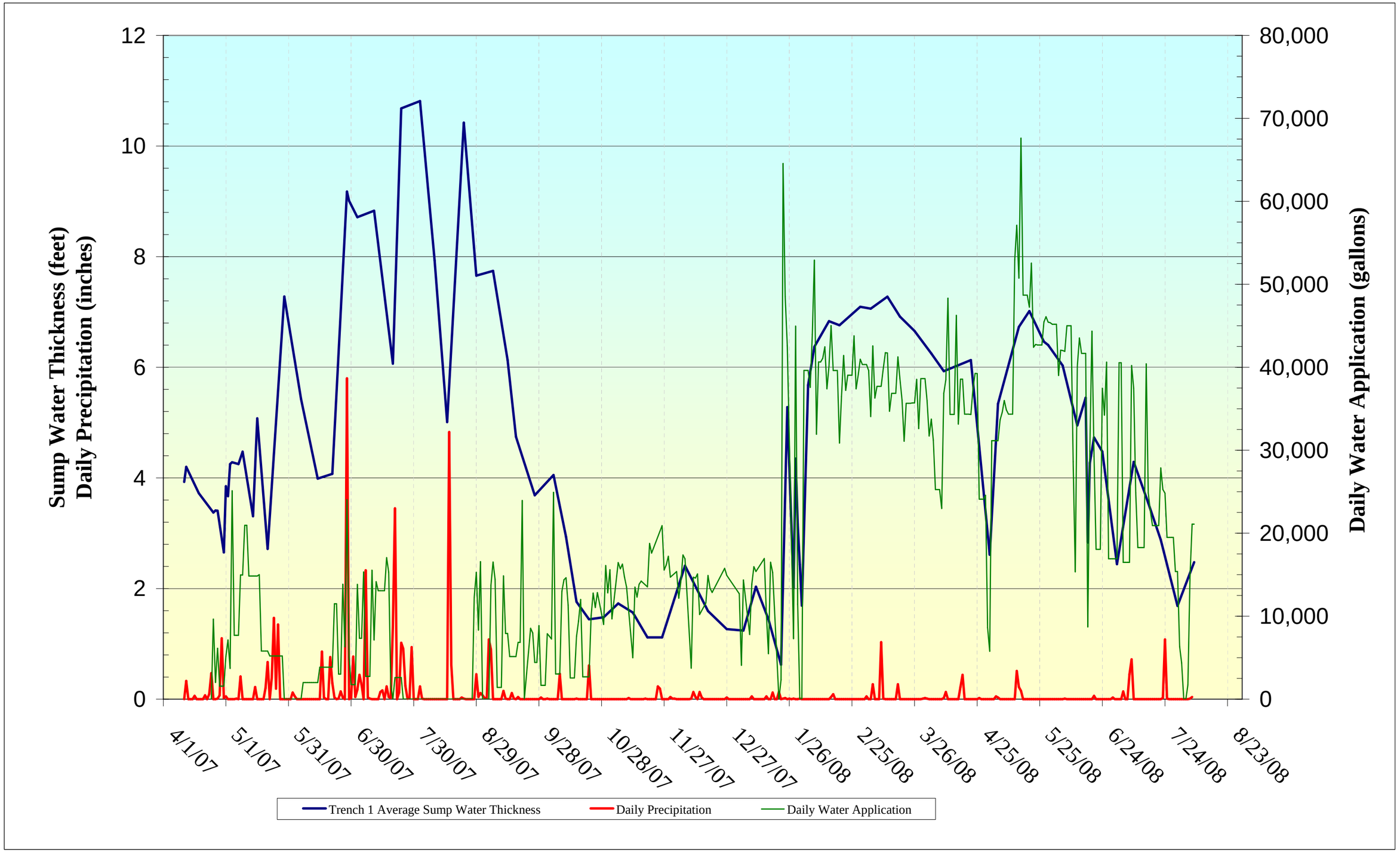

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Figure 5.5.5 Cumulative Total Groundwater from CS-MW16 LGR and CC Applied to SWMU B3 Trench 1 through Quarter 5

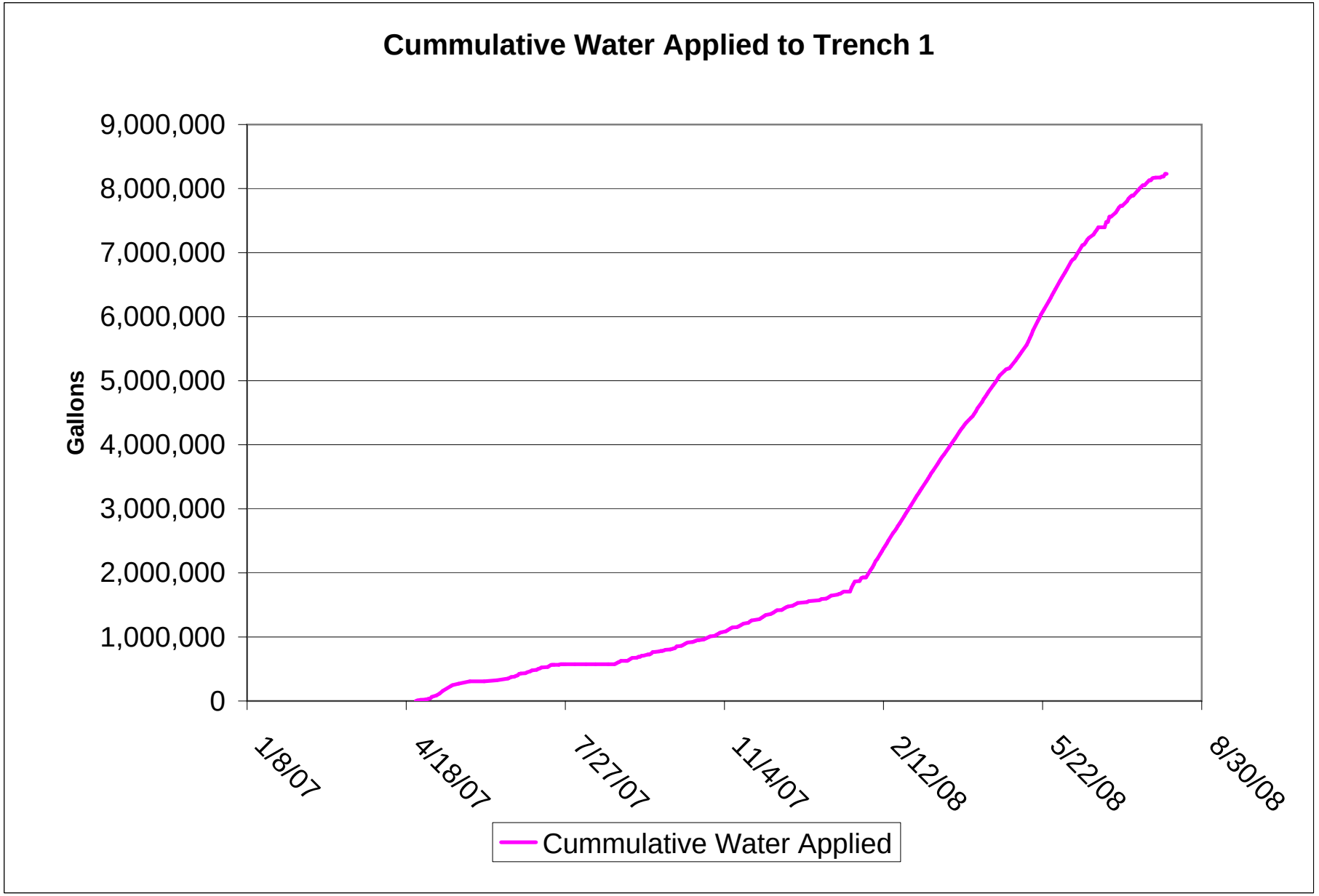
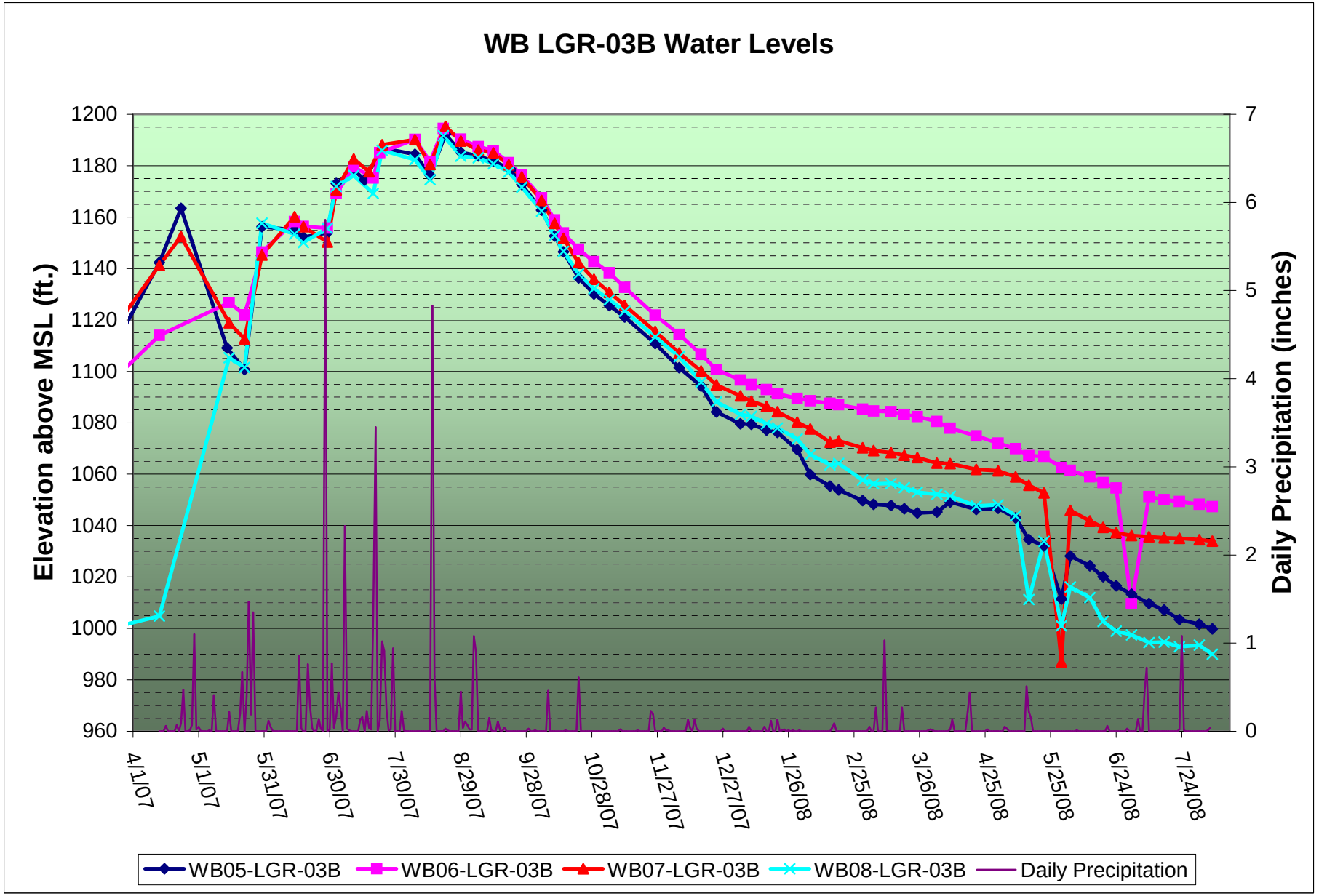


Figure 5.2.5 Lower Glen Rose Groundwater Elevations (feet above MSL) Measured in Westbay Wells through Month 15



J:\745\745953 CSSA DY02\03000 B-3 Bioreactor\Monitoring Data\B-3 Data AL\Q5 B-3 WB water level data 1graph(all).xls

Figure 5.2.2d Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB08-LGR03B

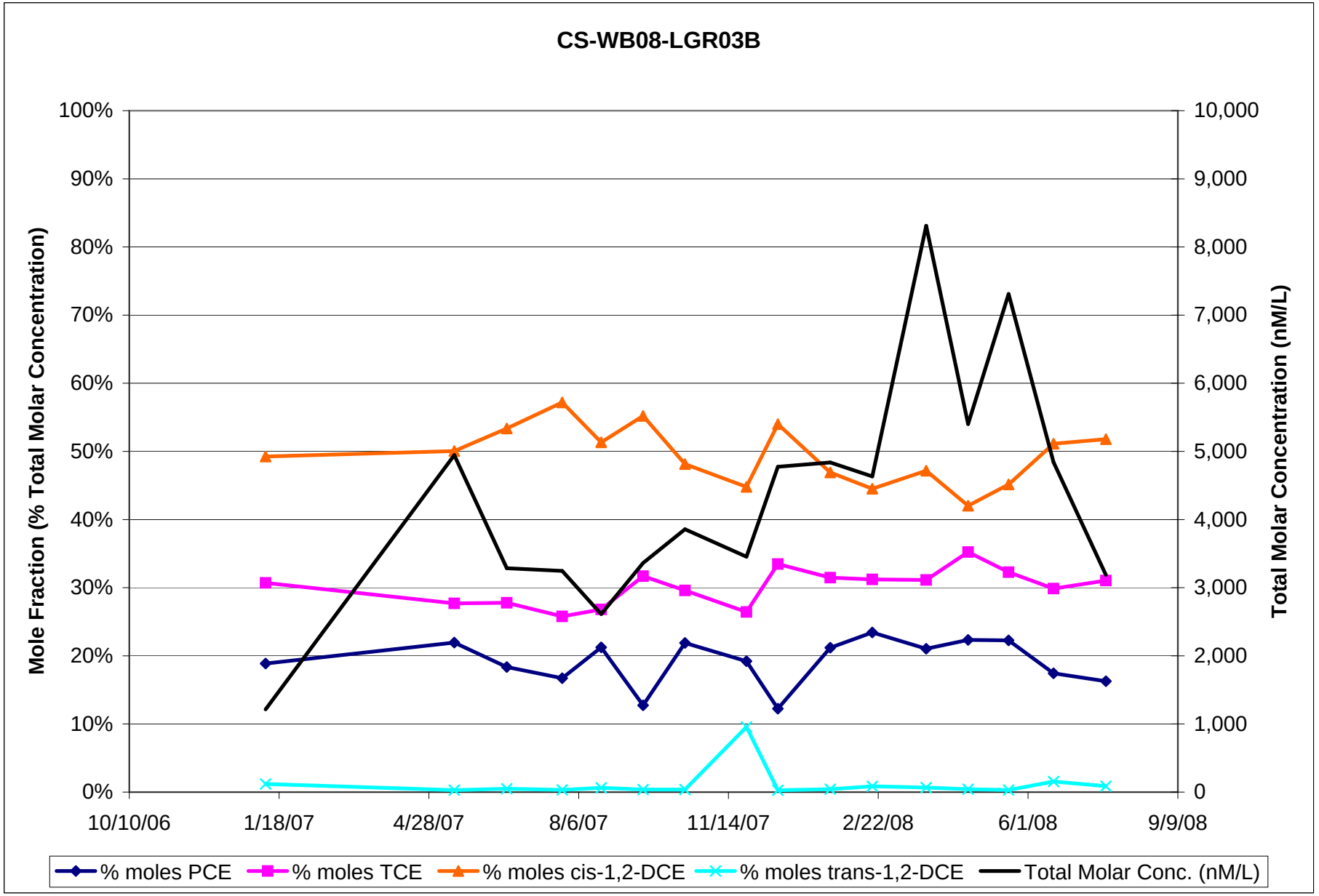


Figure 5.2.2c Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB07-LGR03B

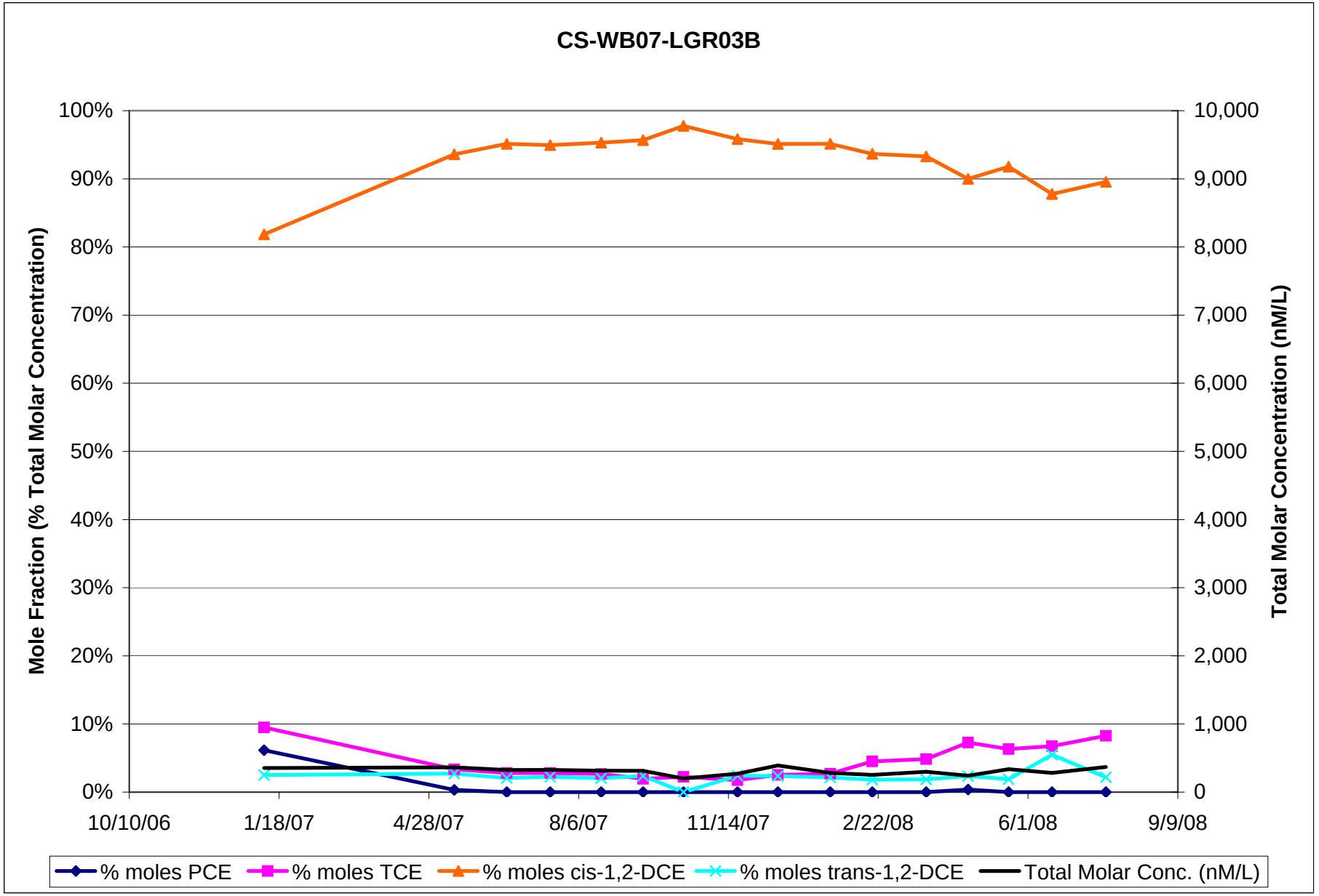


Figure 5.2.2b Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB06-LGR03B

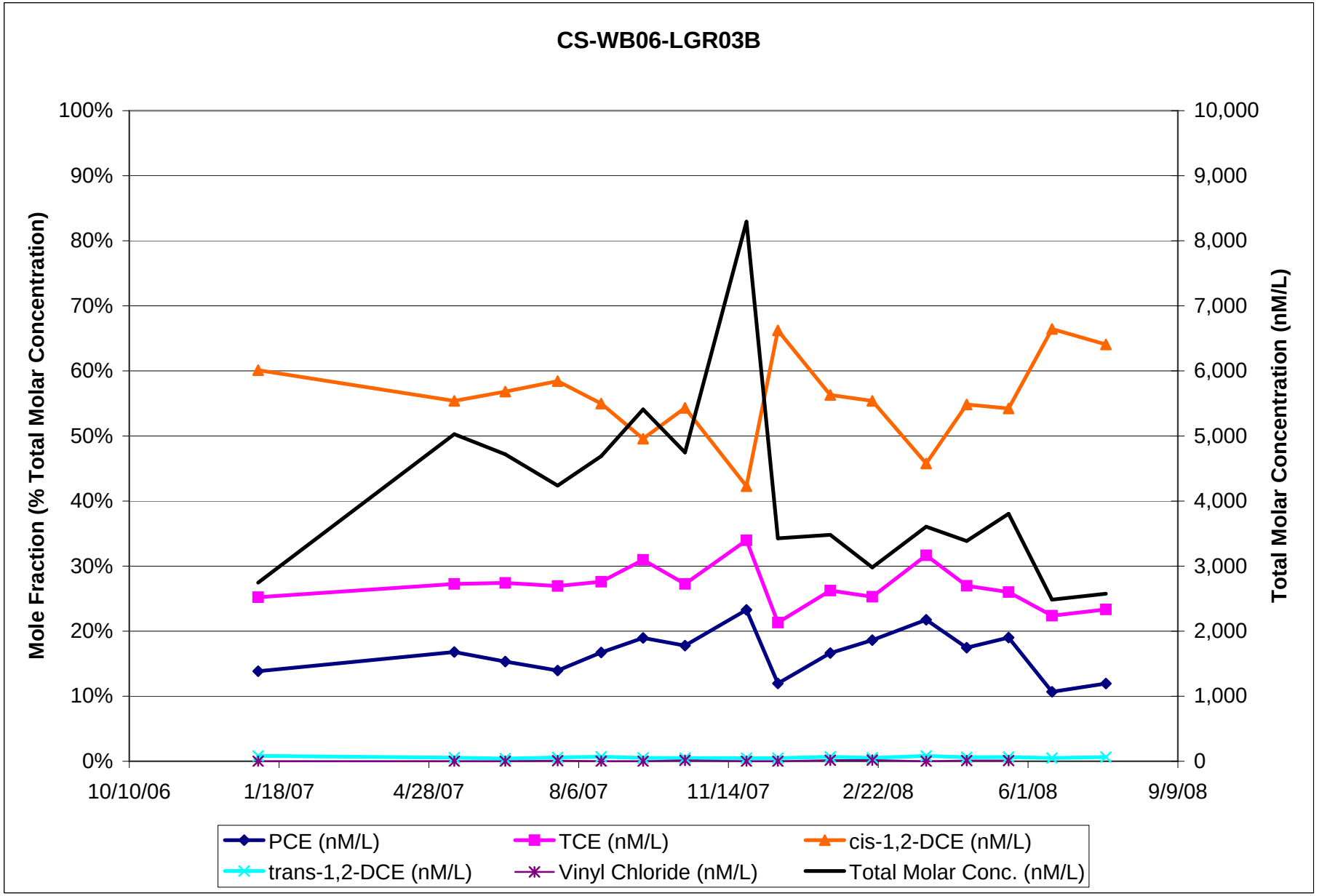
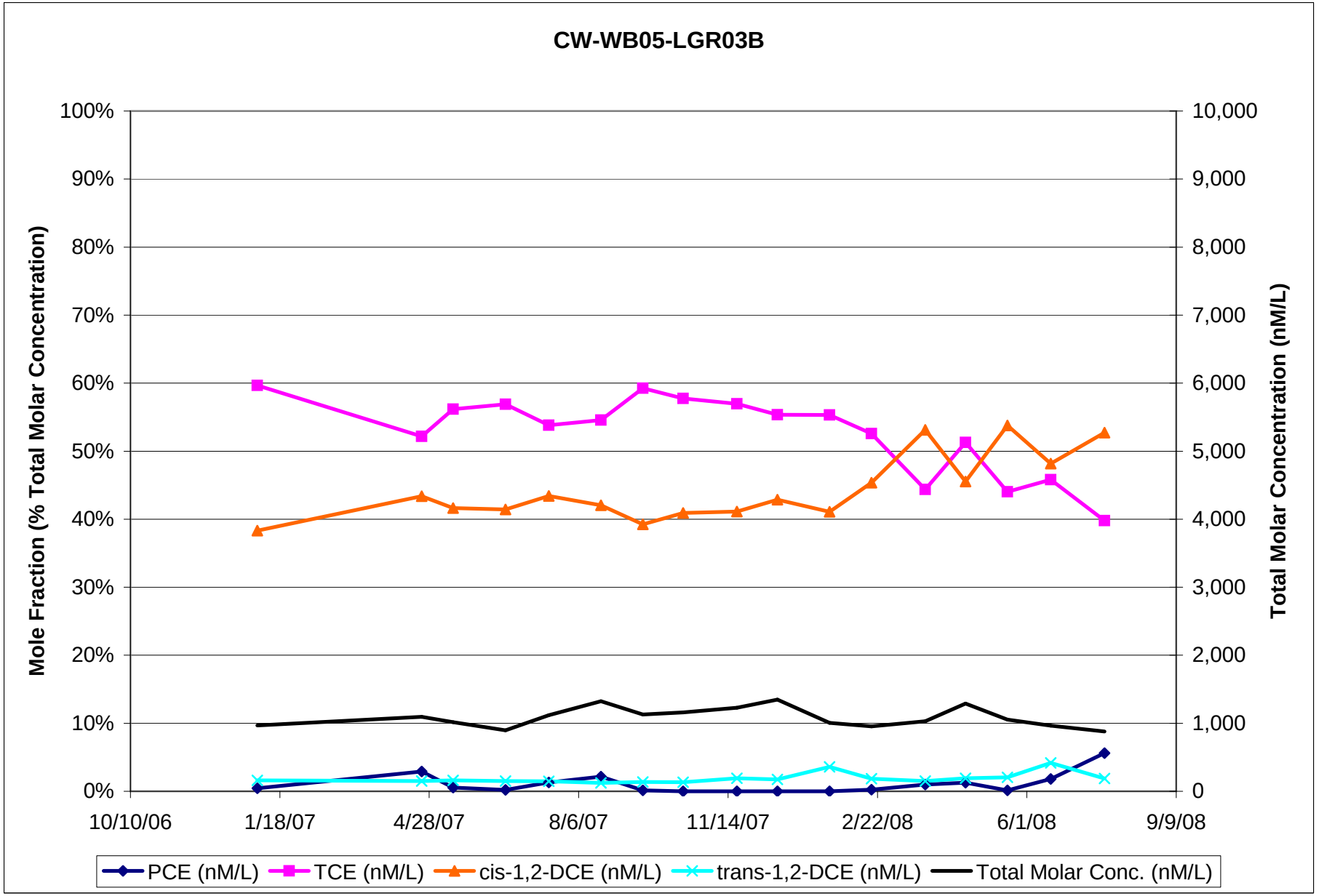
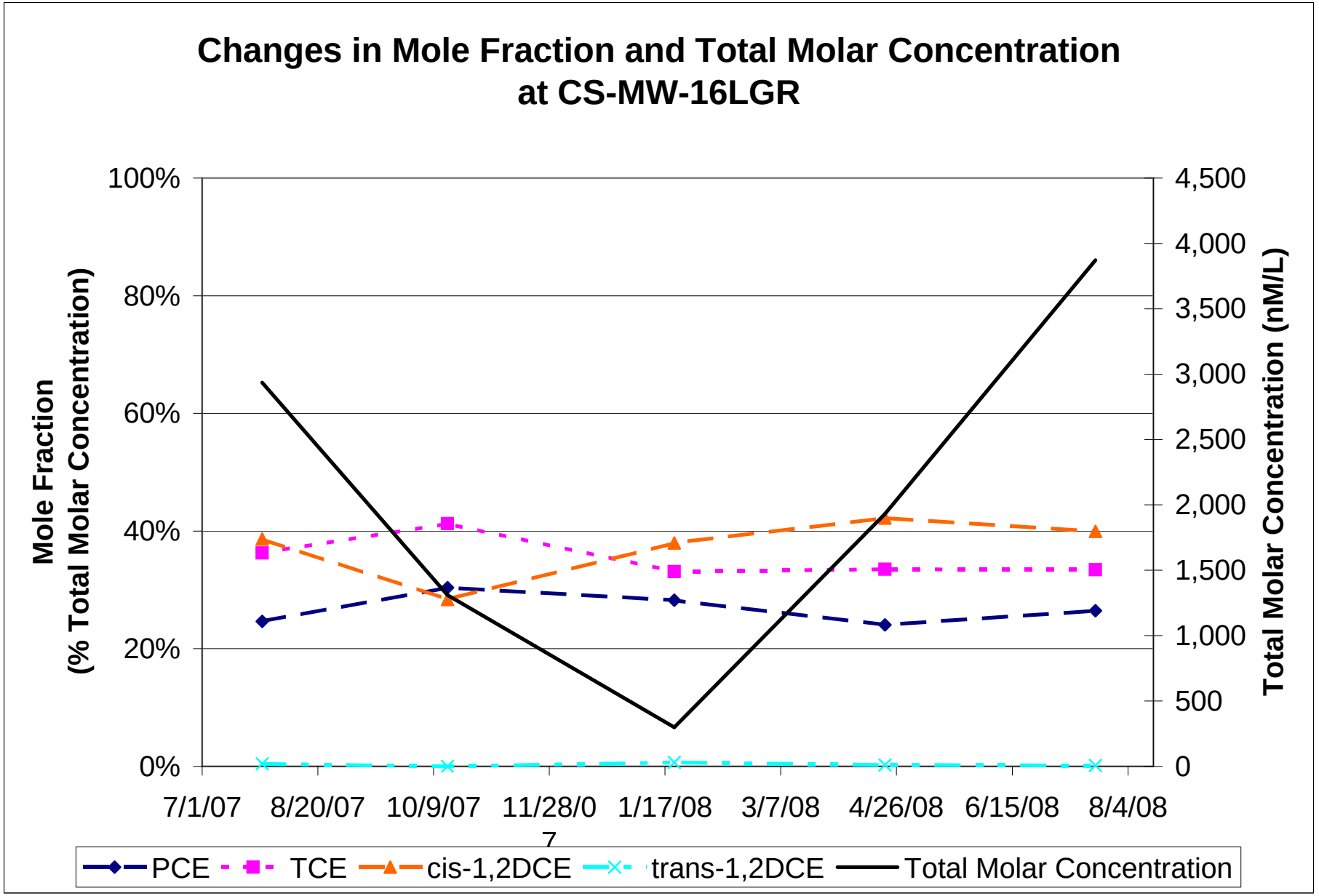
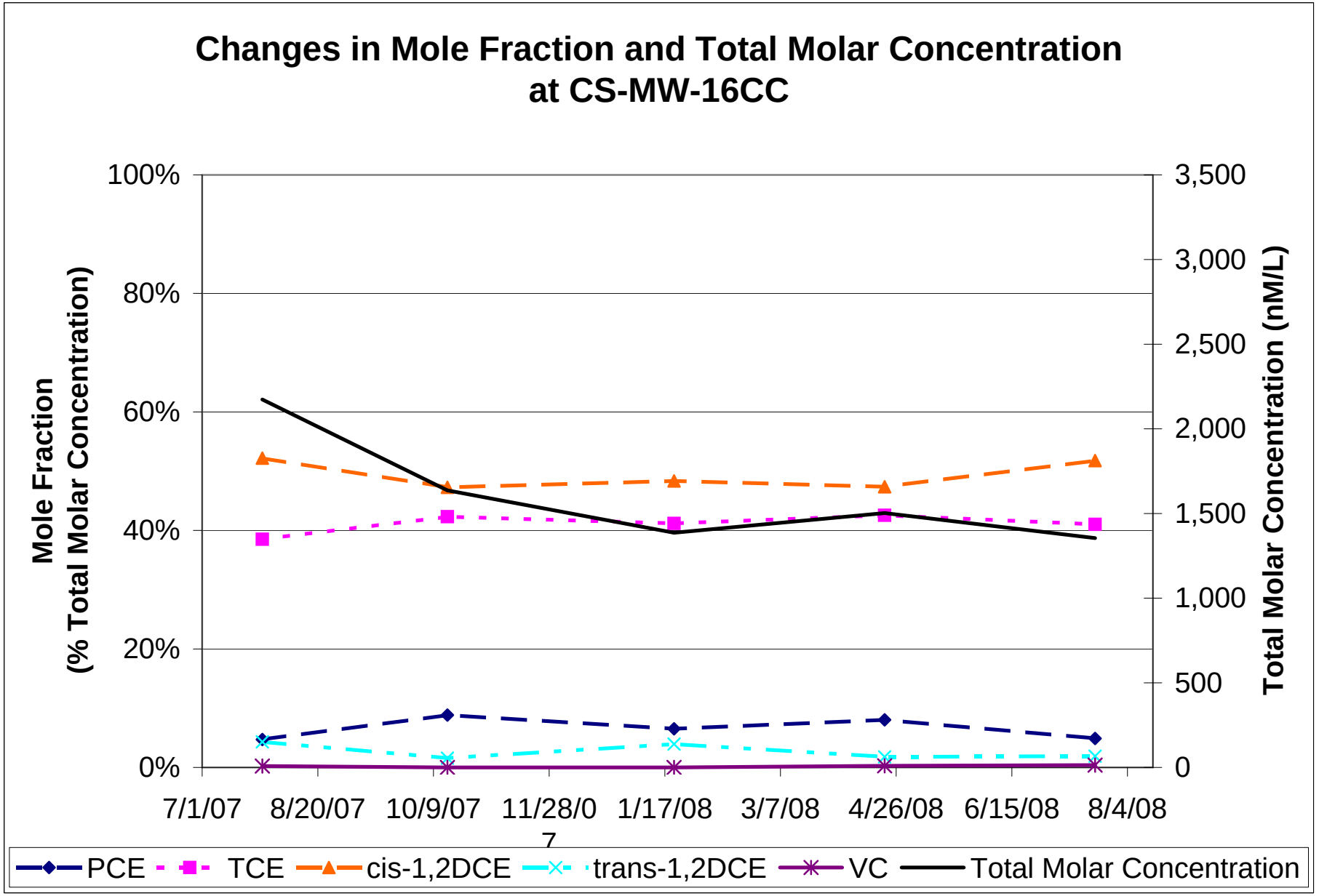


Figure 5.2.2a Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB05-LGR03B




Changes in Mole Fraction and Total Molar Concentration at CS-MW-16LGR
Mole Fraction (% Total Molar Concentration)
100%
80%
60%
40%
20%
0%
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Total Molar Concentration (nM/L)
7/1/07
8/20/07
10/9/07
11/28/07
1/17/08
3/7/08
4/26/08
6/15/08
8/4/08
PCE
TCE
cis-1,2DCE
trans-1,2DCE
Total Molar Concentration


Changes in Mole Fraction and Total Molar Concentration at CS-MW-16CC
Mole Fraction (% Total Molar Concentration)
100%
80%
60%
40%
20%
0%
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Total Molar Concentration (nM/L)
7/1/07
8/20/07
10/9/07
11/28/07
1/17/08
3/7/08
4/26/08
6/15/08
8/4/08
PCE
TCE
cis-1,2DCE
trans-1,2DCE
VC
Total Molar Concentration