CSSA B-3 BIOREACTOR OPERATIONS
PERFORMANCE STATUS REPORT
(QUARTER 8, MONTHS 22 – 24, FEBRUARY – APRIL, 2009)

JUNE 17, 2009

This status report summarizes the operation of a bioreactor at Solid Waste Management Unit (SWMU) B-3 from February 1, 2009 through April 30, 2009, comprising the eighth 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 April 2009 are attached for reference. Parsons site personnel working on this project during the reporting period include Ken Rice, Samantha Elliott, Eric Tennyson, Adrien Lindley, Julie Bouch, Michael Zugelder, Edward Galbavy, and Justin Kirk.

Executive Summary

Site conditions were cool and moderately dry through the quarter with 3.74 inches of precipitation reported. Injection of extracted groundwater continued through the quarter. The few interruptions resulted from ground water levels reaching the automatic cut-off water levels in the extraction wells. Approximately 14,837,962 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 2,218,698 gallons of extracted groundwater from wells CS-MW16-LGR and CS-MW16-CC were injected into the bioreactor during quarter 7. The majority of extracted groundwater, ~1,453,000 gallons, was from the CS-MW16-CC well, while ~766,000 gallons were extracted from the CS-MW16-LGR well. By letter dated July 31, 2008, 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 June, 2009. The UIC report containing Quarter 7 and 8 data was delivered to the TCEQ on June 15, 2009.

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 generally less 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.

Analytical results for samples collected in trench 1 sumps provide evidence that biotic and abiotic dechlorination of trichloroethene (TCE) is occurring. The consistent presence of the end product ethene provides evidence that the biotic reductive dechlorination process appears to be the major pathway for degradation of CAHs within trench 1. Additionally, two other degradation mechanisms, both biotic and abiotic, appear to be occurring within trench 1.

It appears that biotic anaerobic oxidation of CAHs to carbon dioxide may be occurring with Mn (IV) as the terminal electron acceptor. This degradation pathway reaction results in the production of the reduced form of manganese [Mn (II)]. The detections of high concentrations of Mn(II) in trench 1 may be the result of this biotic process.

Evidence for the existence of an abiotic reductive dechlorination is the presence of reduced iron [Fe(II)] and trans-DCE in trench 1. Although evidence suggests this degradation pathway exists, it may not be a significant contributor to the overall degradation of contaminants.

Summary of Bioreactor Operation

Initial baseline and quarter 1 through quarter 8 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, 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 8 monitoring results from the surrounding wells and bioreactor trench sumps are attached, analytical results of the surrounding SWMU B-3 multi-port monitoring wells (MPMW or Westbay®) and monitoring wells are also attached.

Results of VOC analysis from monitoring data indicate that groundwater from the uppermost saturated zone of the Westbay® well CS-WB07 contains < 100 micrograms per liter (µg/L) of PCE, TCE, and *cis*-DCE, while CS-WB05 contains < 100 µg/L of PCE and TCE, CS-WB06 contains < 100 µg/L PCE, and CS-WB08 contains > 100 µg/L of PCE, TCE, and *cis*-DCE. Groundwater from CS-MW16-LGR contains > 100 µg/L of PCE, TCE, and *cis*-DCE. Quarterly data from the bioreactor trench sumps indicate reductions in contaminant mass (total molar concentration) in T1-1 and T1-2, and slight increases in contaminant mass in T1-3 and T2-1, however, over the bioreactor operational period, contaminant mass appears stable or decreasing.

Water quality field measurements from the bioreactor sumps generally indicate that DO has fallen from the previous quarter to an average of 0.40, ORP averages less than -225 mV, pH ~ 6.47, temperatures range from 21.5 ^{o}C to 23.55 ^{o}C, and specific conductivity ranges from 0.574 to 0.925 millisiemens per centimeter (mS/cm). Other observations regarding the data collected during this reporting period are listed below.

Through the 8th quarter, 3.74 inches of precipitation were measured at the B-3 bioreactor site. Average water thickness in Trench 1 during this period is approximately 3.44 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, the CVOC concentrations in CS-MW16-LGR, 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 5.3 µg/L for As (MCL is 10 µg/L) and from 128 to 345 µg/L for Mn (MCL is 50 µg/L). Elevated levels of Mn and As were reported in only one of the surrounding monitoring wells during this quarter (CS-B3-MW01) with a Mn of 250 µg/L, and an As of 10.3 µg/L. Elevated levels of Mn were reported in CS-WB06-UGR01 (837 µg/L), and elevated levels of As were reported in CS-WB05-LGR04B (15.9 µg/L); all other MPMW zones reported Mn and As levels below the MCL. 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. Additionally, the biotic anaerobic

oxidation pathway of CAHs may also be contributing to the elevated levels of Mn within the treatment system.

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 indicates a continuation of a predominately a three-component (VC, DCE isomer, and ethene) chemical composition in water collected from the trench sumps. This indicates the further reduction of contaminants along the degradation pathway toward the end product ethene. Total molar concentrations in trench sumps T1-1 and T1-2 remain stable or decreased slightly through the quarter. Slight increases in total molar concentrations were reported in trench sumps T1-3 and T2-1. The trans-DCE isomer in trench 1 is theorized to be the result of an abiotic reductive dechlorination pathway.
4. The dissolved hydrogen concentration in trench 1 sump samples was in the range consistent with reductive dechlorination of CAHs by DHC.
5. Saturated conditions are being maintained within bioreactor Trench 1 with an average water thickness for the quarter of approximately 3.44 feet with ~120,000 more gallons injected into the bioreactor in quarter 8 than in quarter 7.
6. 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.

Anticipated Schedule for Next Period (November 2008 – January, 2009):

- Continue monitoring and maintenance activities for delivery of groundwater to the bioreactor trenches.
- Conduct monthly monitoring events in May and June (Months 25 and 26), and quarterly monitoring event in July (Month 27) for bioreactor system.
- Continue UIC monthly monitoring with semi-annual reporting due December 2009.
- Complete new extraction well construction for delivery of additional water to the bioreactor. Additionally, plans are being prepared to install six shallow monitoring wells near the bioreactor.
- Plans for a water pressure “tracer” test which would inject a large quantity of water into selected trenches and monitoring of water levels in trench sumps, Westbay® wells, and surrounding monitoring wells are on-going.

Specific Data Observation Notes for Attachments

- Analytical results from the B-3 Trench 1 Sump samples, shown in Table 8.1.2, present data from the quarter 8 sampling events.
- Table 8.1.1 indicates a water thickness of approximately 3.44 feet in trench 1 was maintained.
- Table 8.1.2 indicates that VC was present at moderate concentrations in trench 1 sumps (ranging from ND to 25 µg/L) and Ethene was observed in concentrations ranging from ND to 14.2 µg/L.
- Table 8.1.3 indicates that Mn(II) and Fe(II) were present at concentrations consistent with alternative degradation pathways. Additionally, Table 8.1.3 provides evidence of the biotic anaerobic degradation pathway with the elevated concentrations of Mn and CO_2.
- Table 8.3.3 indicates that vinyl chloride was present (3.7 µg/L) in the sample taken from monitoring well CS-B3-MW01, which remains consistent with samples collected through the previous 21 months.
- Table 8.4.4 indicates that the *Dehalococcoides* (DHC) bacteria populations are very low or are no longer present in the trench sumps.
- The changes in molar fraction and total molar concentrations shown in graphs of quarter 8 trench 1 sumps indicate a continued reduction in contaminant mass to end products VC and ethene.
- Figure 8.2.5 shows that the water levels in Westbay wells are significantly influenced by precipitation, or lack there of, and pumping at CS-MW16-LGR.

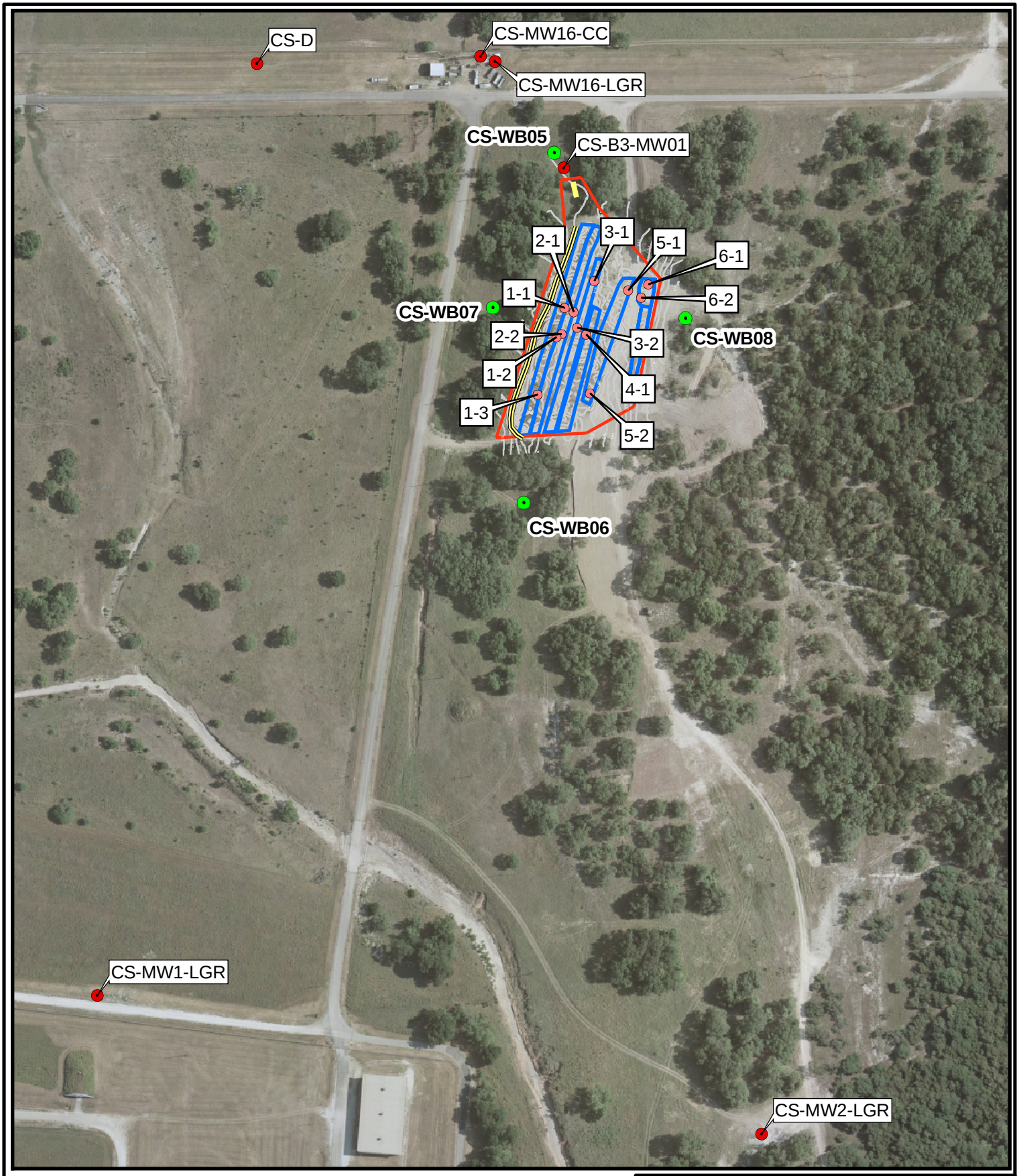

Figure 1

B-3 Bioreactor System
Camp Stanley Storage Activity

P a r s o n s

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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
Monthly Sampling[a] (22)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monthly Sampling (23)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quarterly Sampling[b] (8)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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

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
	6 = Quarter 6
	7 = Quarter 7
	8 = Quarter 8
Second digit (Well/Sump Sampled)	1 = Trench Sumps
	2 = Westbay Wells
	3 = Monitoring Wells
	4 = Combination of Wells and Sumps
	5 = Injection System
	6 = Extraction Wells
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	

Figures

Figure 8.1.2T1-1 B-3 Bioreactor Trench 1 Sump 1 VOC Summary through Quarter 8

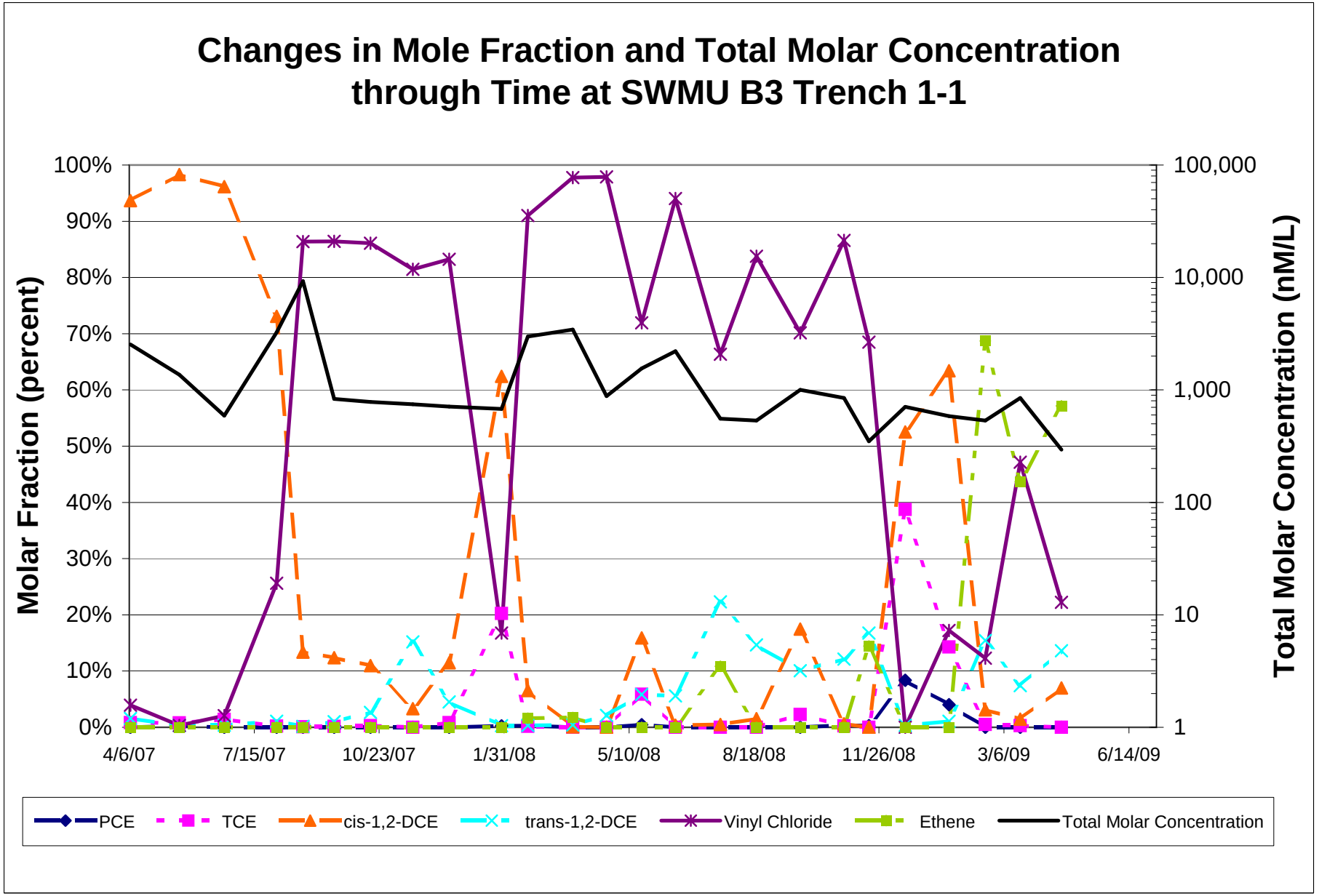

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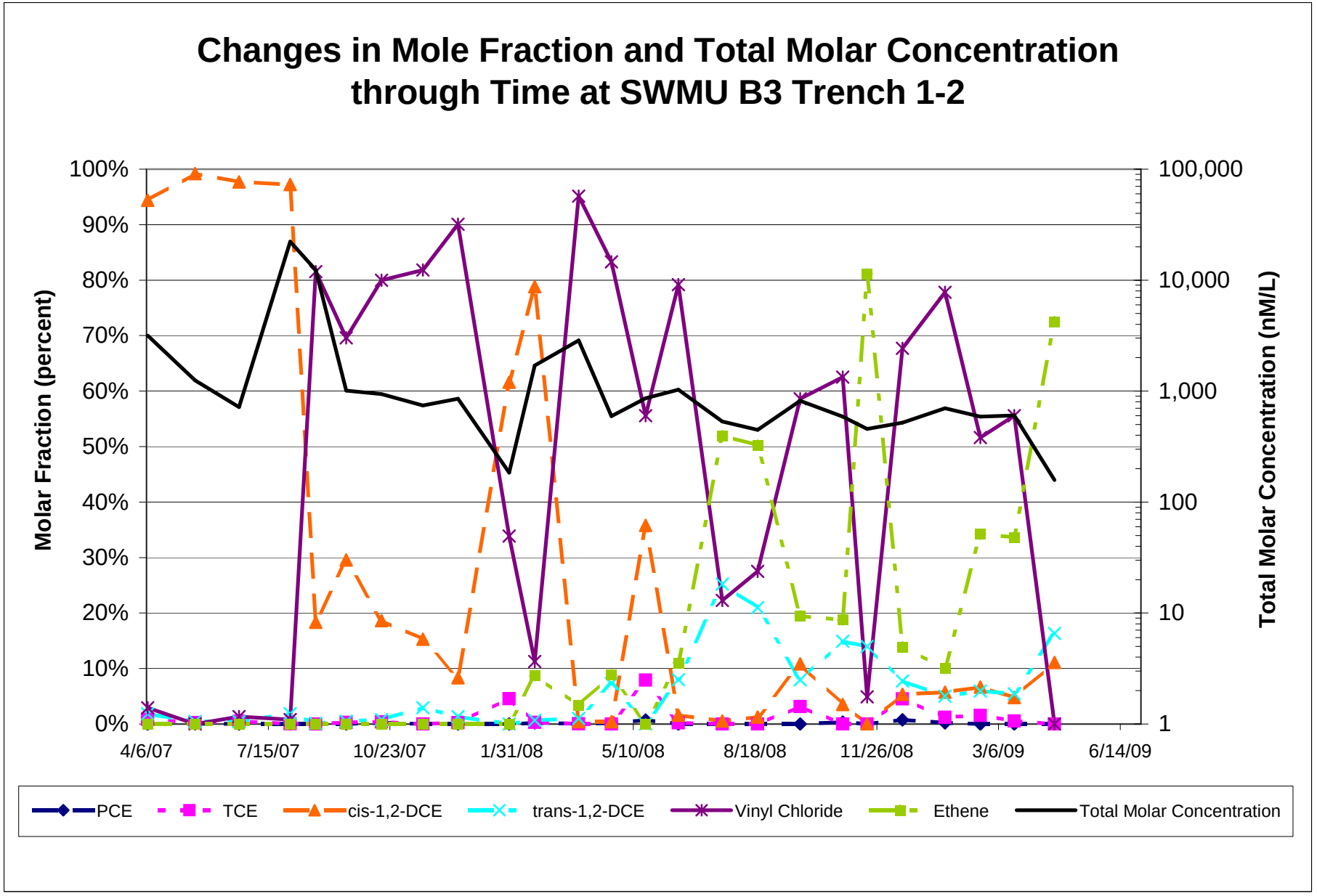
Figure 8.1.2T1-2 B-3 Bioreactor Trench 1 Sump 2 VOC Summary through Quarter 8



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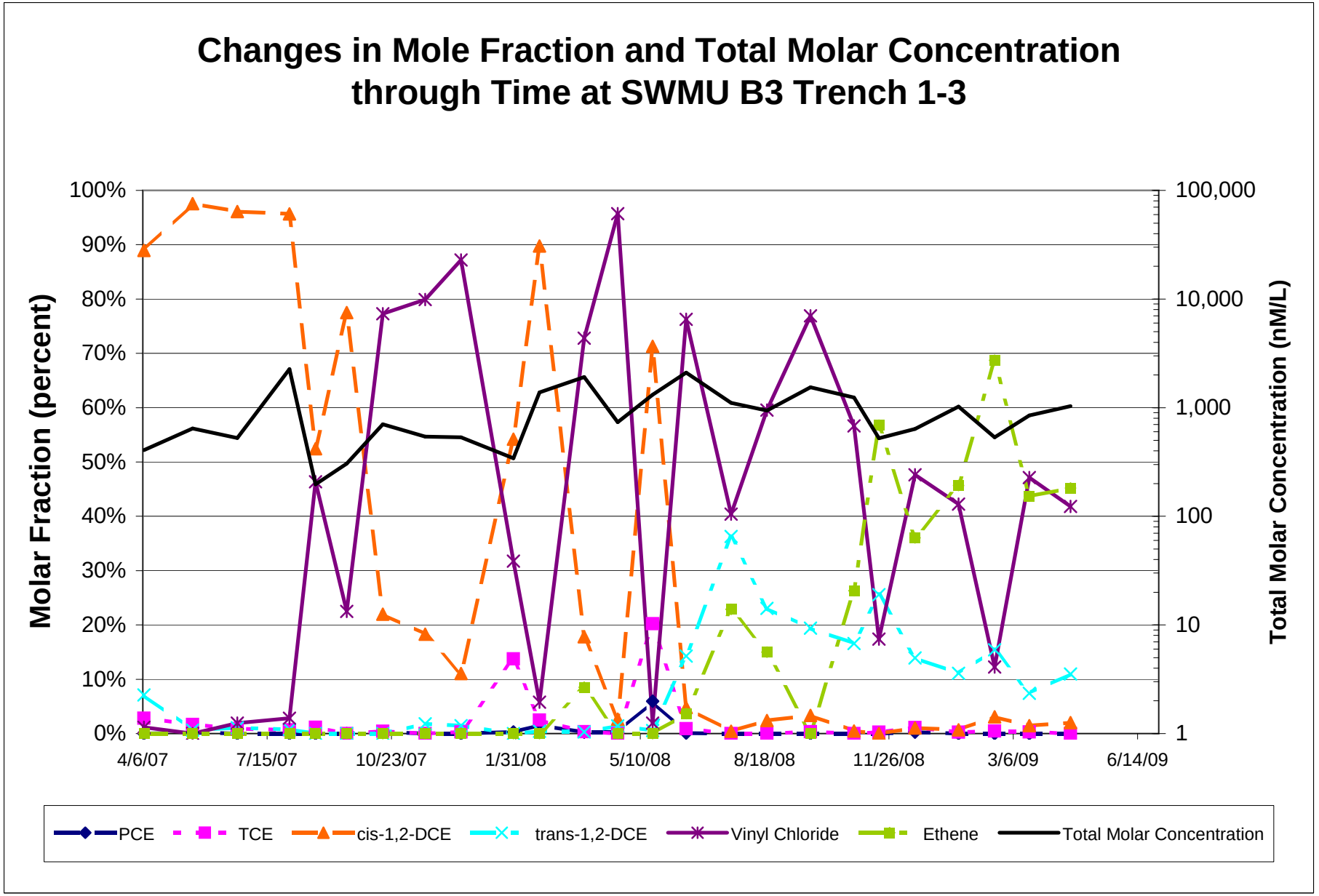
Changes in Mole Fraction and Total Molar Concentration through Time at SWMU B3 Trench 1-3
Molar Fraction (percent)
Total Molar Concentration (nM/L)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
100,000
10,000
1,000
100
10
1
4/6/07
7/15/07
10/23/07
1/31/08
5/10/08
8/18/08
11/26/08
3/6/09
6/14/09
PCE
TCE
cis-1,2-DCE
trans-1,2-DCE
Vinyl Chloride
Ethene
Total Molar Concentration

Figure 8.1.2T2-1 B-3 Bioreactor Trench 2 Sump 1 VOC Summary through Quarter 8

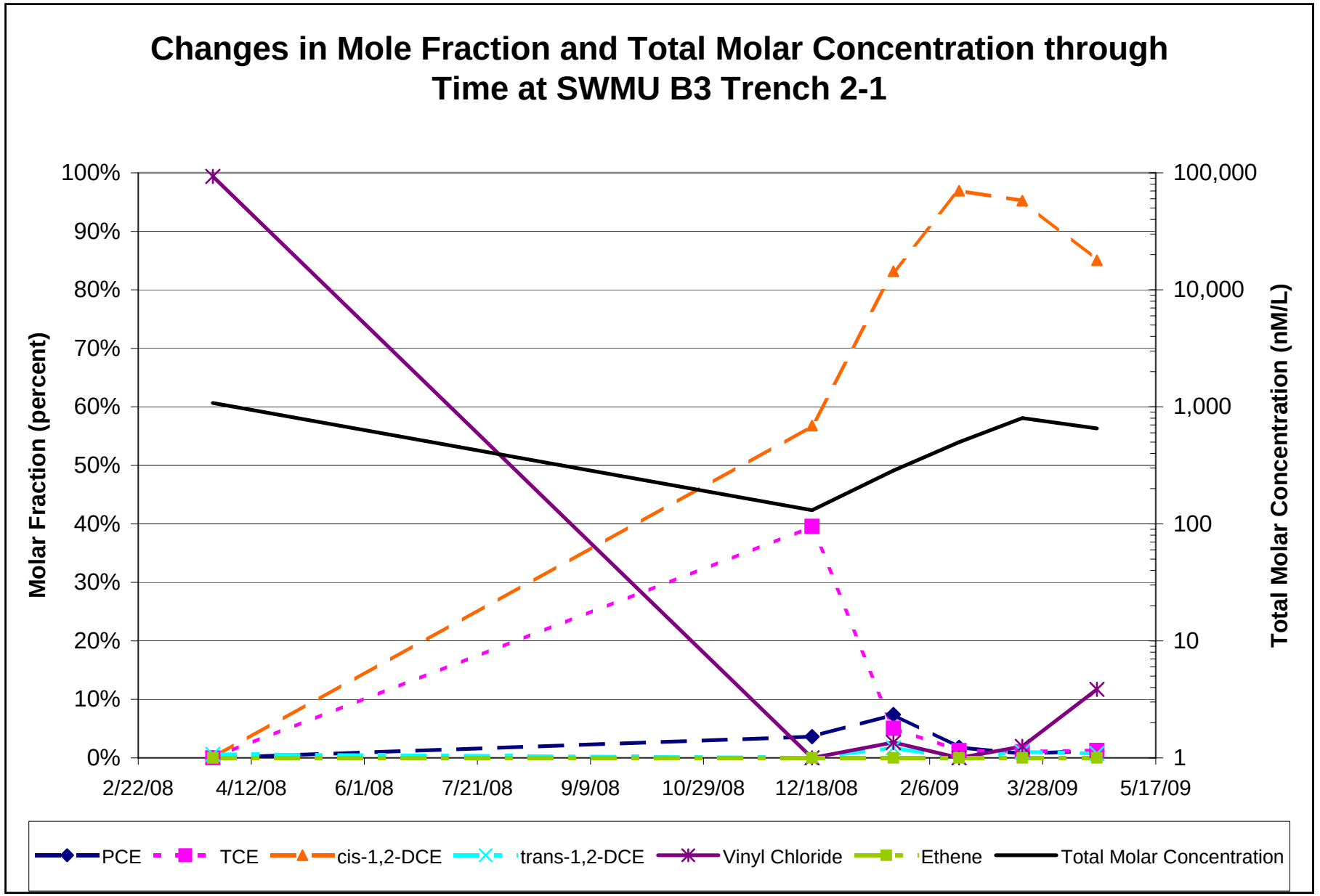

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Figure 8.2.2a Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB05-LGR03B

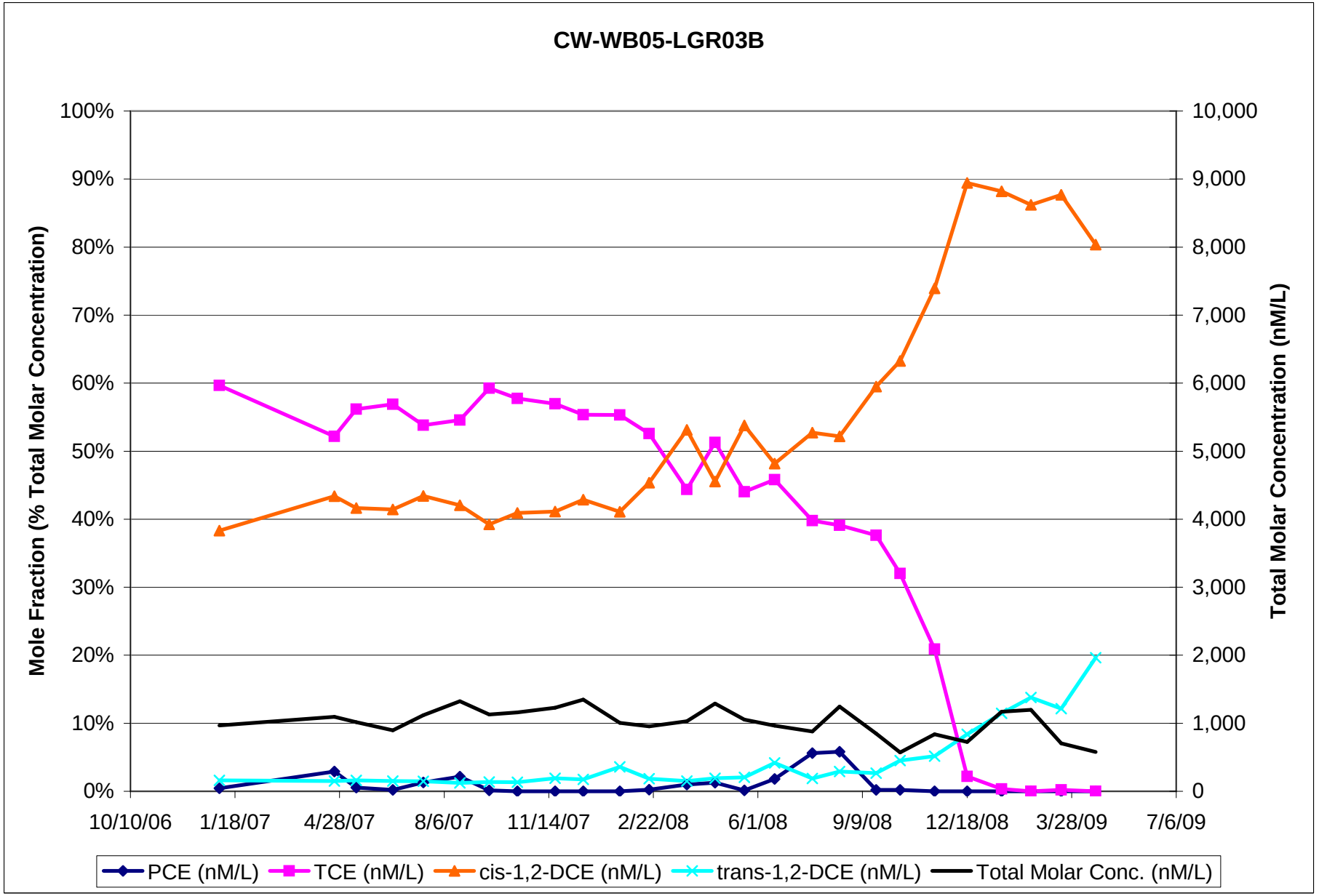

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Figure 8.2.2b Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB06-LGR03B

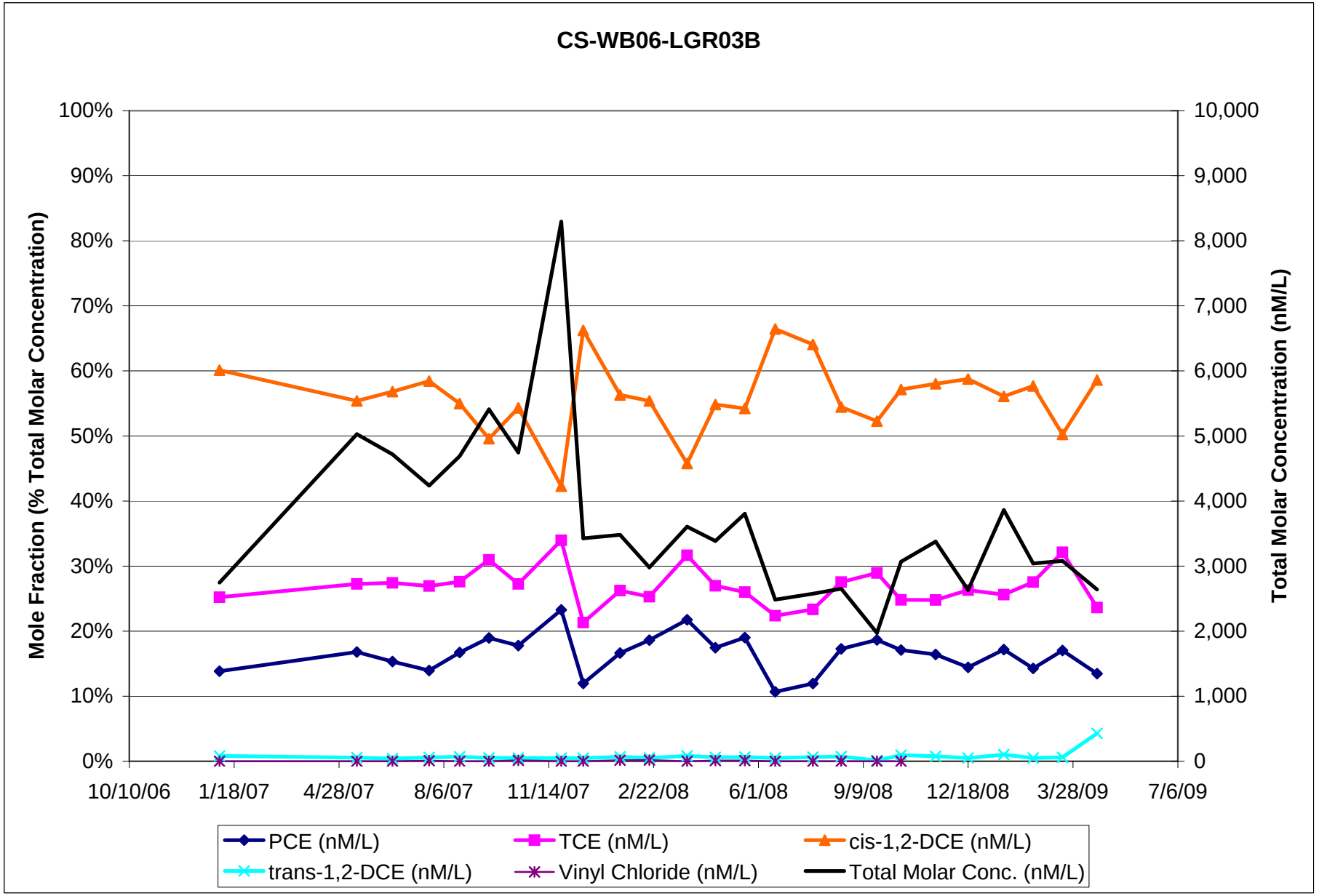

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Figure 8.2.2c Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB07-LGR03B

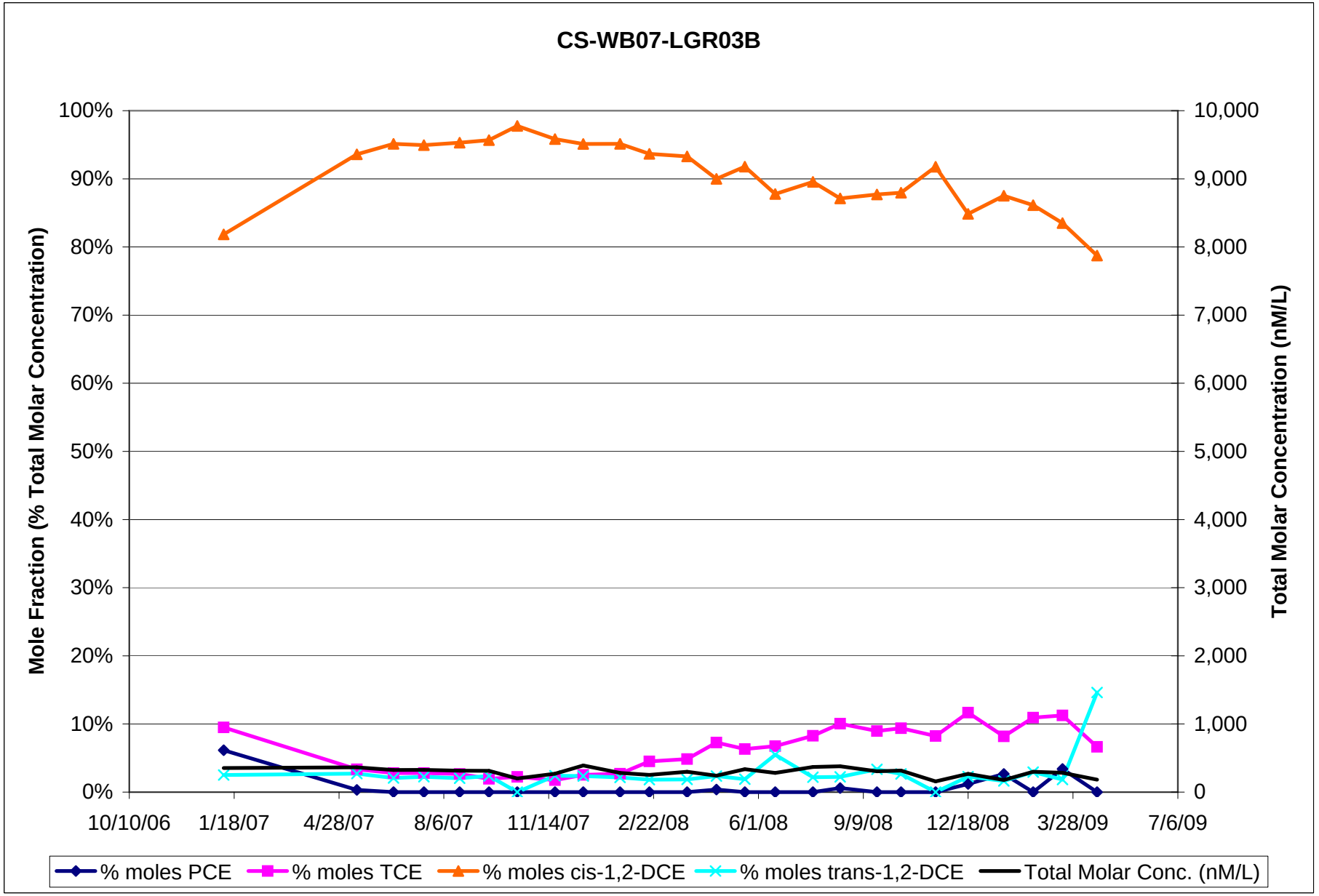

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Figure 8.2.2d Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB08-LGR03B

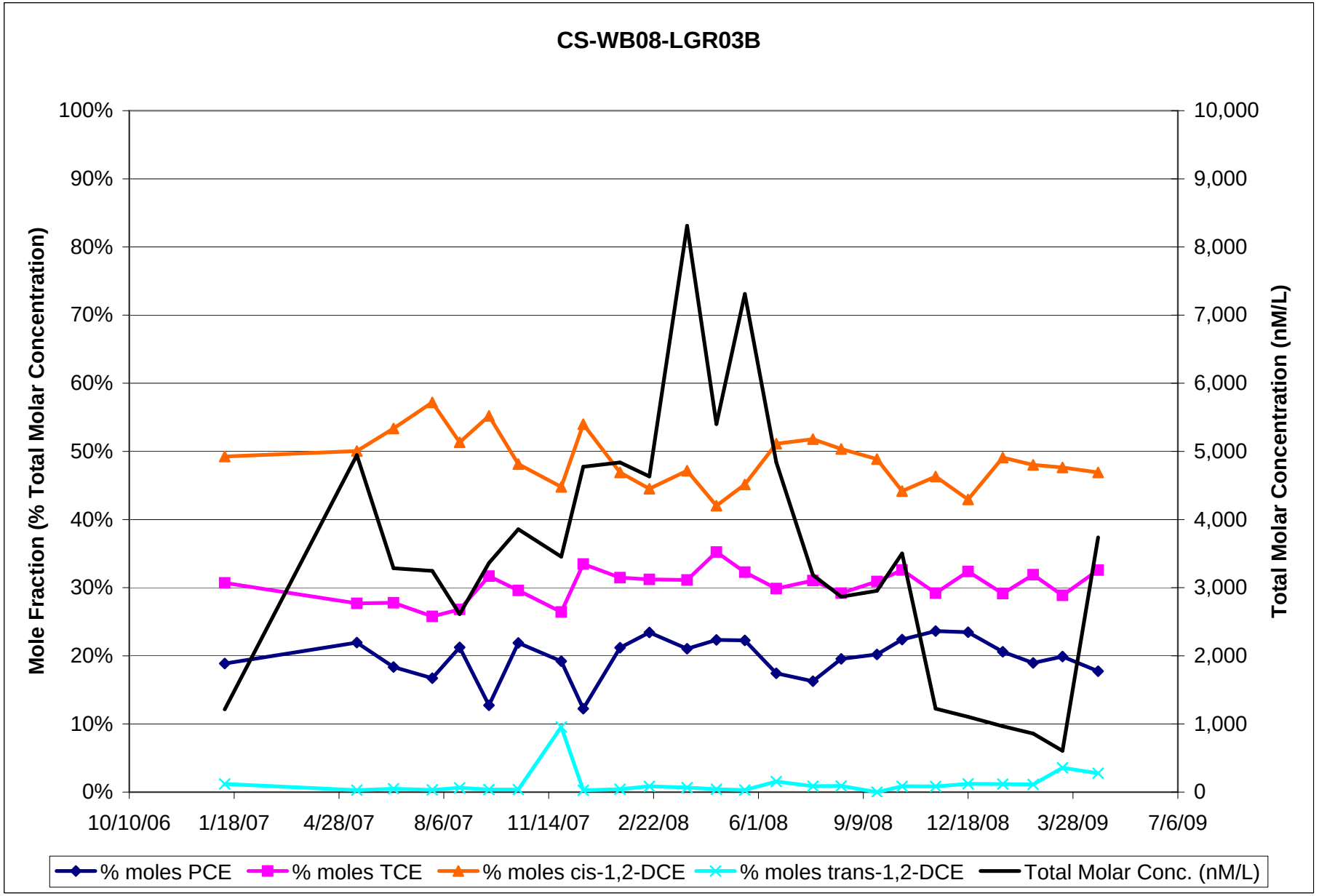

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Figure 8.2.5 Lower Glen Rose Groundwater Elevations (feet above MSL) Measured in Westbay Wells through Quarter 8

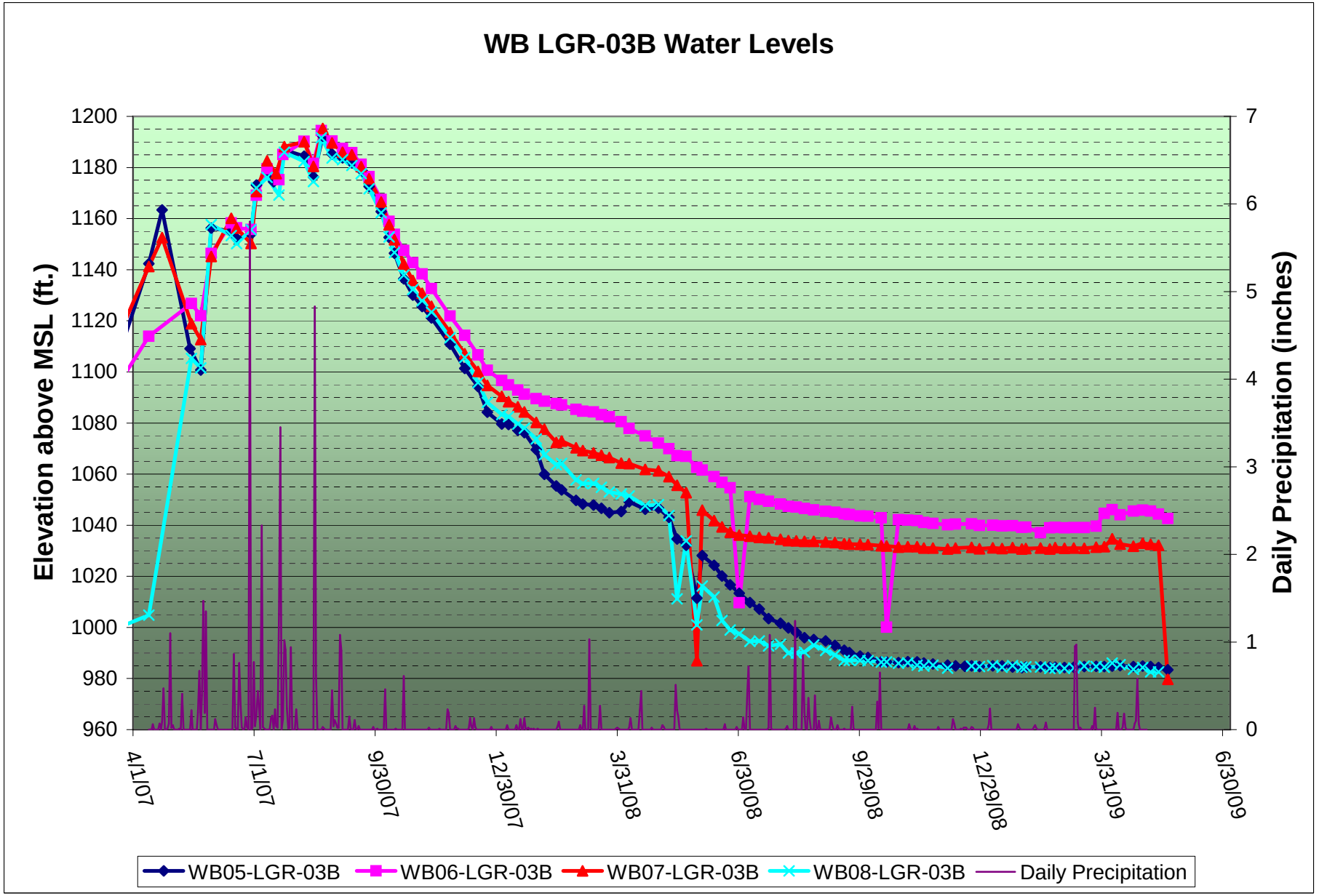

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Figure 8.3.3 Well CS-MW16-LGR CVOC Concentrations, Volume Pumped, and Precipitation

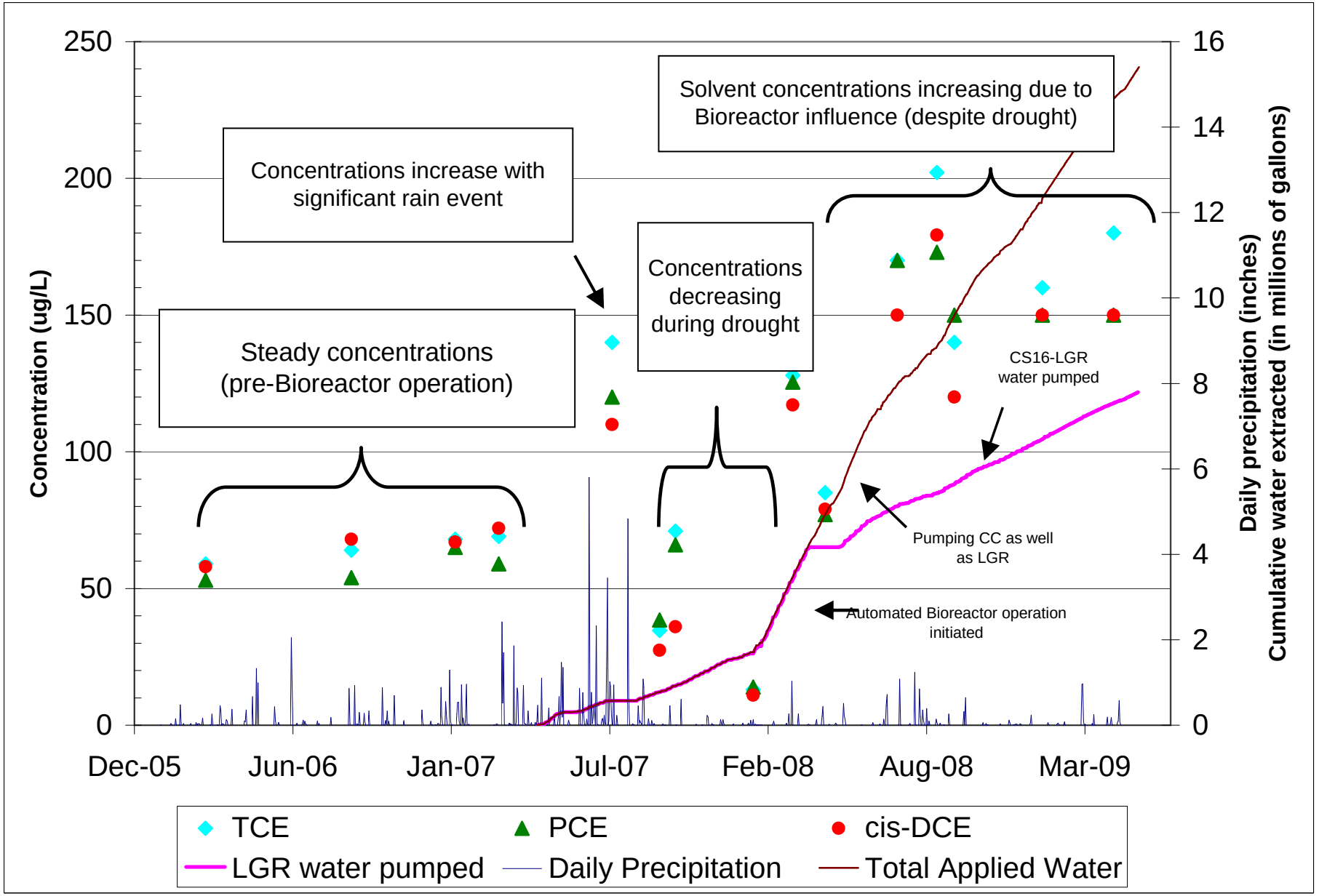


Figure 8.5.5 Cumulative Total Groundwater from CS-MW16 LGR and CC Applied to SWMU B3 Trench 1and 2 through Quarter 7

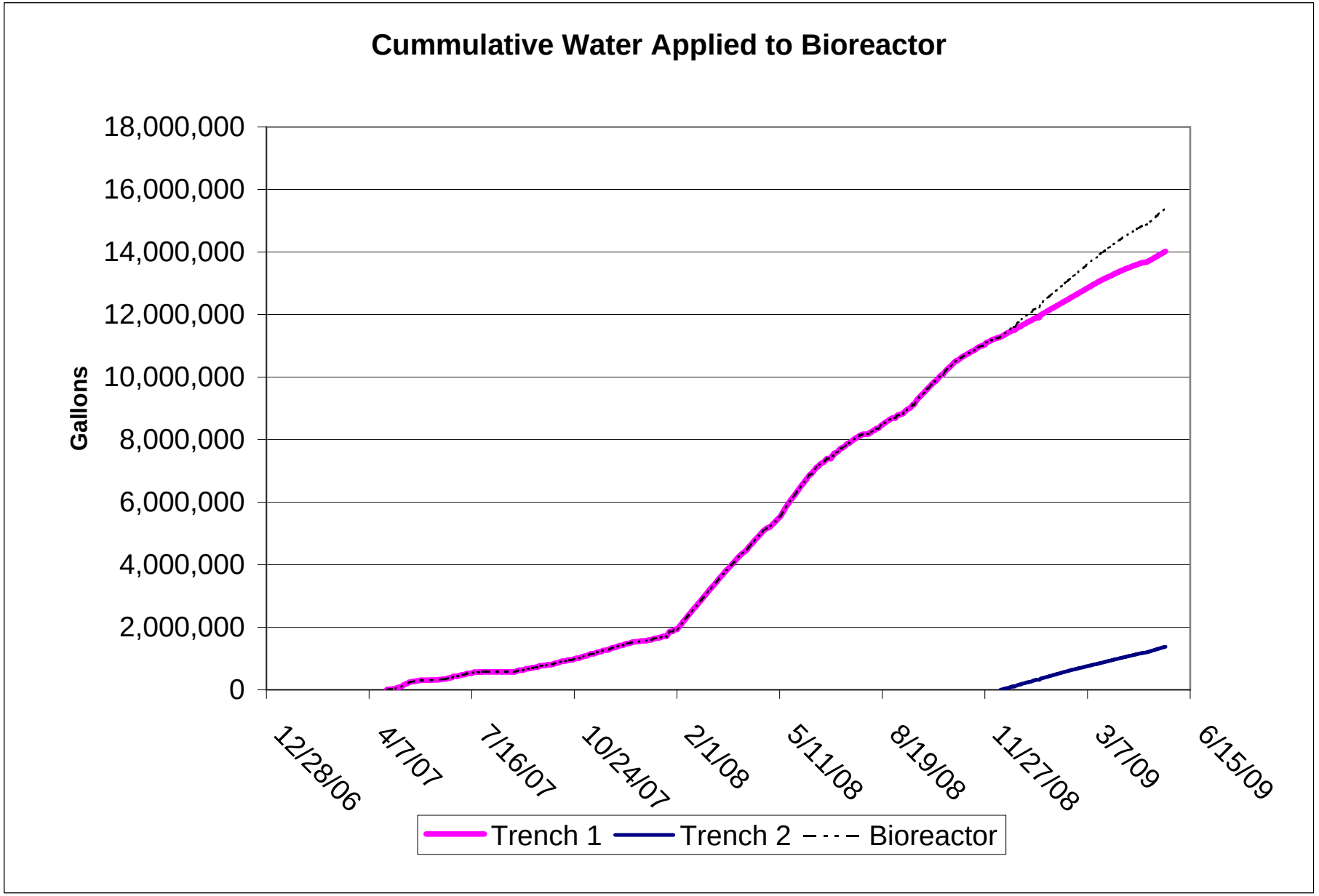
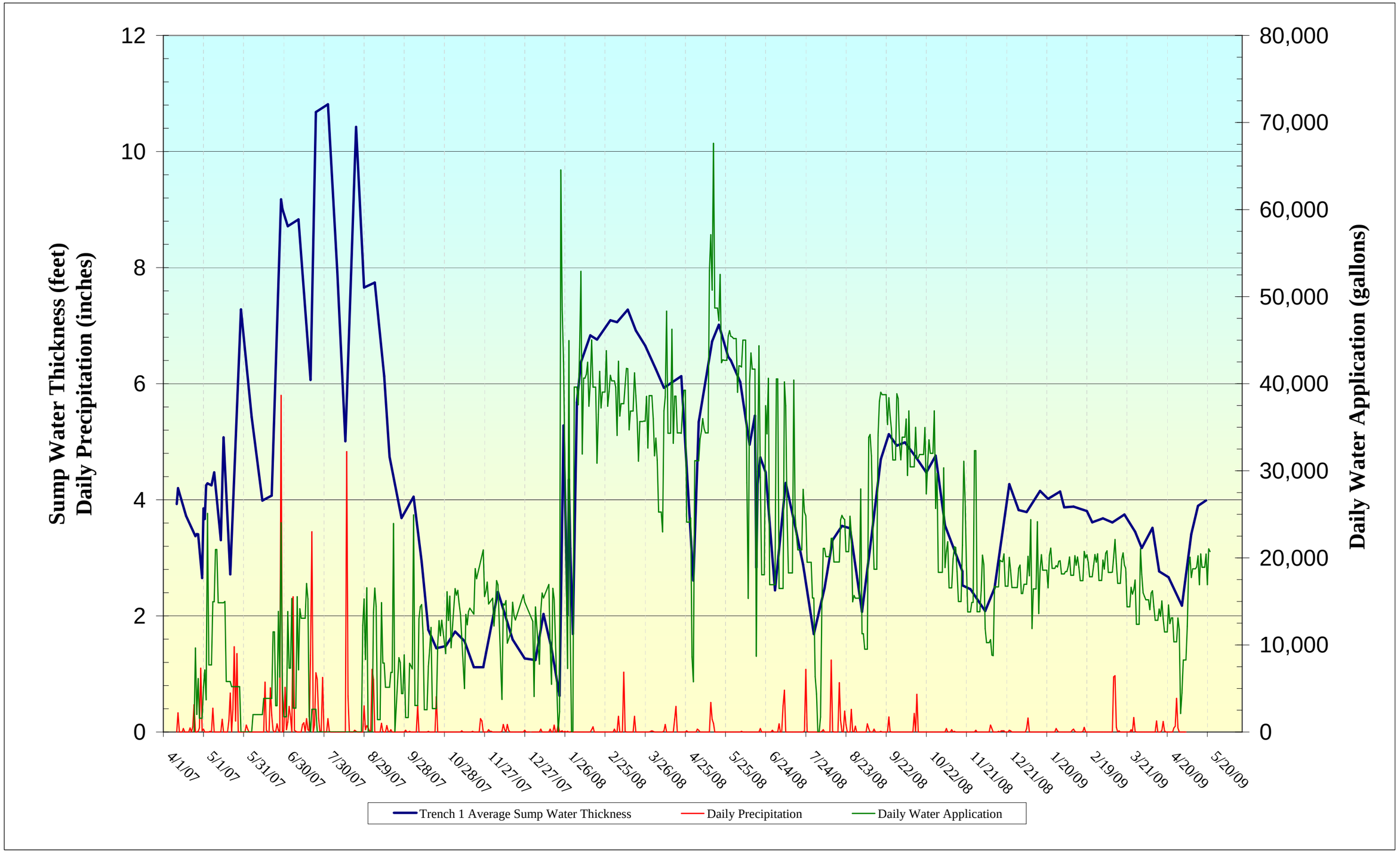


Figure 8.5.6

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



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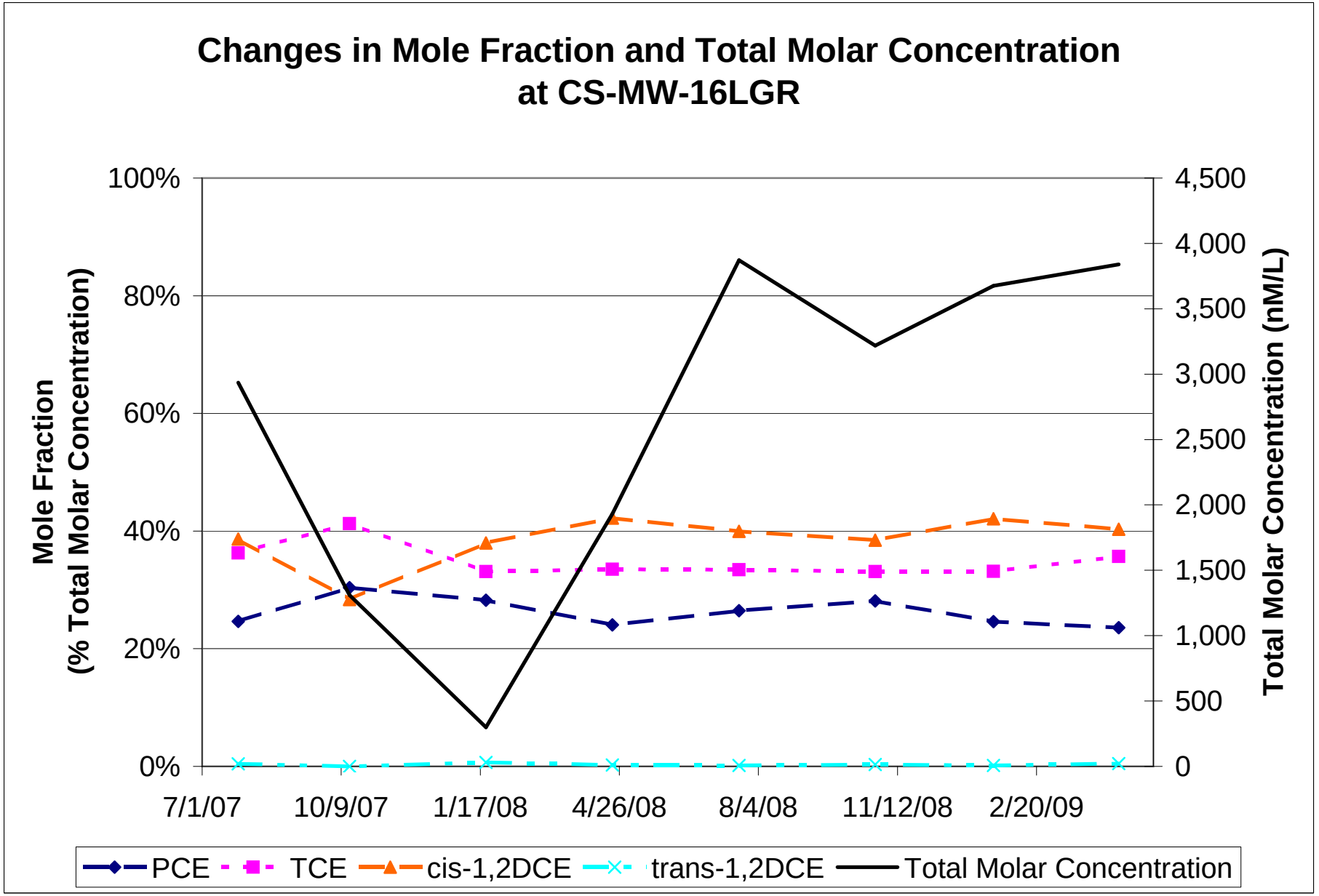
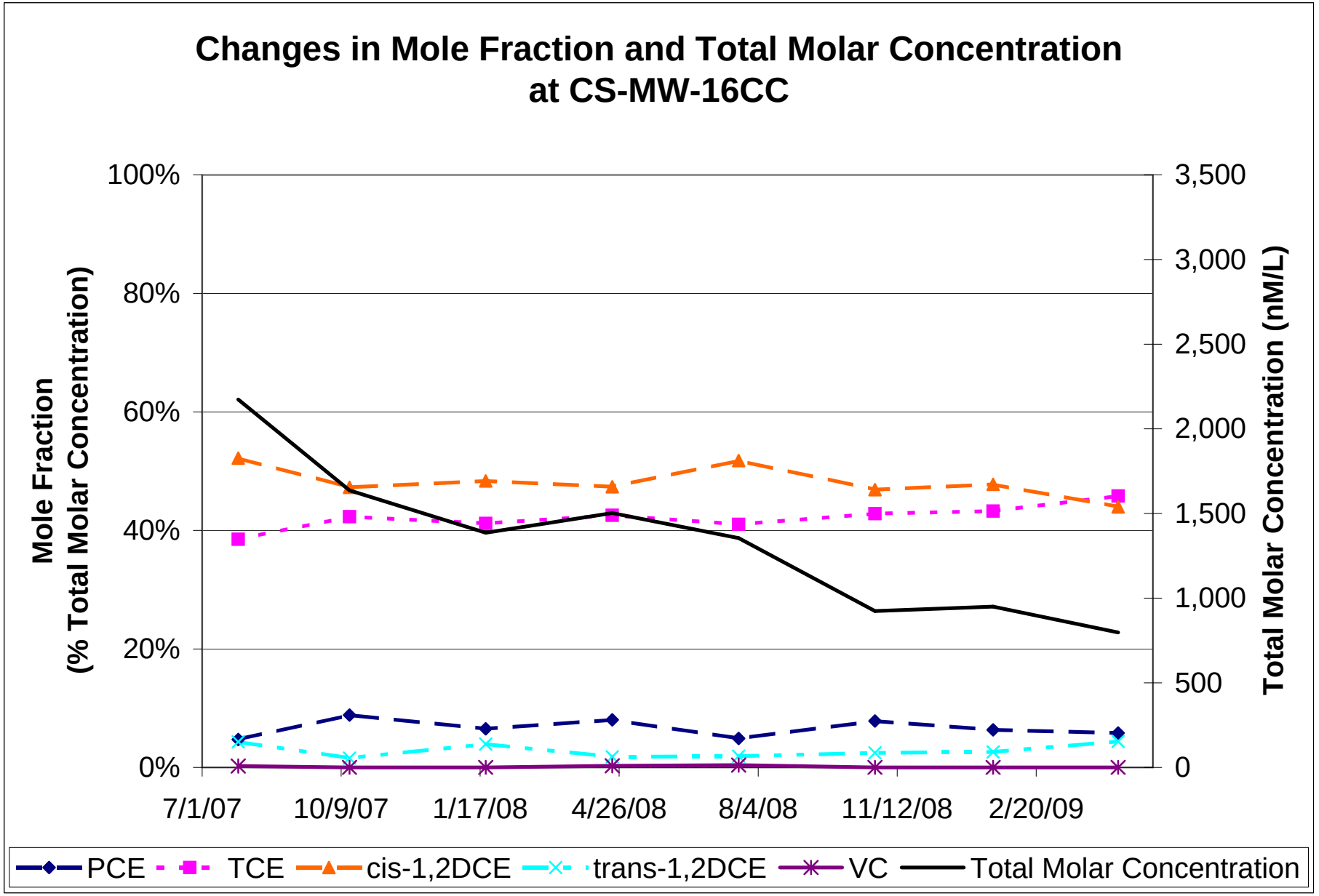

Changes in Mole Fraction and Total Molar Concentration at CS-MW-16LGR
Mole Fraction (% Total Molar Concentration)
100%
80%
60%
40%
20%
0%
Total Molar Concentration (nM/L)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
7/1/07
10/9/07
1/17/08
4/26/08
8/4/08
11/12/08
2/20/09
PCE
TCE
cis-1,2DCE
trans-1,2DCE
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
10/9/07
1/17/08
4/26/08
8/4/08
11/12/08
2/20/09
PCE
TCE
cis-1,2DCE
trans-1,2DCE
VC
Total Molar Concentration

Tables

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	9.05	6.90	21.78	0.696	0.45	-233.8	3.85
2/9/2009	1130	9.10	6.50	22.15	0.873	0.49	-247.9	3.80
2/19/2009	1005	9.28	6.30	22.45	0.641	0.49	-279.7	3.62
2/23/2009	935	9.47	6.40	23.00	0.828	0.40	-229.9	3.43
3/3/2009	1300	9.19	6.39	22.55	1.024	0.36	-236.5	3.71
3/10/2009	940	9.32	6.48	23.02	0.94	0.42	-250.3	3.58
3/19/2009	845	9.39	6.56	22.23	0.998	0.43	-207.1	3.51
3/27/2009	1110	9.64	6.53	23.09	1.002	0.42	-245.3	3.26
4/1/2009	1450	9.50	6.49	23.06	0.613	0.39	-175.6	3.40
4/9/2009	1515	9.44	6.36	23.21	0.578	0.41	-220.9	3.46
4/14/2009	1025	10.35	6.48	23.44	0.884	0.52	-224.6	2.55
4/21/2009	900	10.60	6.39	23.55	0.645	0.36	-219.1	2.30

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	8.78	6.92	21.59	0.727	0.44	-265.6	3.62
2/9/2009	1130	8.75	6.54	22.05	0.886	0.48	-264.60	3.65
2/19/2009	1005	8.81	6.36	22.17	0.618	0.40	-242.8	3.59
2/23/2009	935	9.00	6.45	22.32	0.917	0.38	-244.6	3.40
3/3/2009	1300	8.96	6.45	22.35	0.961	0.38	-249.3	3.44
3/10/2009	940	9.05	6.59	22.99	0.916	0.44	-264.6	3.35
3/19/2009	845	8.90	6.62	22.04	0.980	0.28	-263.9	3.50
3/27/2009	1110	9.18	6.55	22.88	0.972	0.37	-245.3	3.22
4/1/2009	1450	9.17	6.48	23.05	0.621	0.43	-168.8	3.23
4/9/2009	1515	9.14	6.36	23.32	0.633	0.40	-221.6	3.26
4/14/2009	1025	9.91	6.44	23.22	1.000	0.51	-220	2.49
4/21/2009	900	9.80	6.41	23.44	0.727	0.33	-221	2.60

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	8.71	7.00	20.94	0.593	0.38	-255.4	4.14
2/9/2009	1130	8.65	6.53	21.53	0.749	0.41	-242.8	4.20
2/19/2009	1005	8.64	6.40	22.18	0.541	0.32	-269.2	4.21
2/23/2009	935	8.84	6.47	21.98	0.781	0.30	-240.5	4.01
3/3/2009	1300	8.96	6.43	22.65	0.894	0.40	-223.2	3.89
3/10/2009	940	8.95	6.53	22.86	0.818	0.39	-226.9	3.90
3/19/2009	845	8.62	6.59	21.50	0.804	0.36	-222.5	4.23
3/27/2009	1110	8.98	6.54	22.90	0.825	0.36	-243.1	3.87
4/1/2009	1450	9.97	6.47	22.82	0.555	0.46	-141.8	2.88
4/9/2009	1515	9.02	6.34	23.07	0.562	0.43	-192.1	3.83
4/14/2009	1025	9.59	6.57	23.39	0.901	0.41	-209.1	3.26
4/21/2009	900	9.75	6.45	23.33	0.658	0.35	-213.2	3.10

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	8.73	7.16	21.73	0.618	1.27	-85.9	0.94
2/9/2009	1130	8.58	6.69	22.11	0.766	1.06	-117.10	1.09
2/19/2009	1005	8.8	6.63	22.35	0.550	1.50	-109.7	0.87
2/23/2009	935	8.84	6.59	22.89	0.784	1.08	-51.6	0.83
3/3/2009	1300	8.74	6.74	22.63	0.828	1.38	-77.6	0.93
3/10/2009	940	8.68	6.6	23.59	0.835	0.41	-188.0	0.99
3/19/2009	845	8.77	6.81	22.48	0.815	1.31	-9.5	0.90
3/27/2009	1110	8.61	6.62	23.44	0.854	0.46	-135.6	1.06
4/1/2009	1450	8.72	6.65	23.51	0.527	0.55	-51.3	0.95
4/9/2009	1515	8.64	6.55	23.67	0.518	0.50	-108.0	1.03
4/14/2009	1025	8.53	6.71	23.78	0.801	0.73	-96.0	1.14
4/21/2009	900	8.65	6.54	24.1	0.609	0.59	-100.9	1.02

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	10.01						0.00
2/9/2009	1130	10.01						0.00
2/19/2009	1005	10.01						0.00
2/23/2009	935	10.01						0.00
3/3/2009	1300	10.01						0.00
3/10/2009	940	10.01						0.00
3/19/2009	845	9.50						0.51
3/27/2009	1110	9.59						0.42
4/1/2009	1450	9.65						0.36
4/9/2009	1515	9.70						0.31
4/14/2009	1025	9.47	6.71	25.11	1.937	0.52	-124.3	0.54
4/21/2009	900	9.69						0.32

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	9.28						0.68
2/9/2009	1130	9.25						0.71
2/19/2009	1005	9.24						0.72
2/23/2009	935	9.20						0.76
3/3/2009	1300	9.23						0.73
3/10/2009	940	9.19						0.77
3/19/2009	845	9.18						0.78
3/27/2009	1110	9.20						0.76
4/1/2009	1450	9.21						0.75
4/9/2009	1515	9.23						0.73
4/14/2009	1025	9.20						0.76
4/21/2009	900	9.26	6.04	27.17	0.587	0.32	-122.6	0.70

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	7.40						0.00
2/9/2009	1130	7.40						0.00
2/19/2009	1005	7.40						0.00
2/23/2009	935	7.40						0.00
3/3/2009	1300	7.40						0.00
3/10/2009	940	7.40						0.00
3/19/2009	845	7.40						0.00
3/27/2009	1110	7.40						0.00
4/1/2009	1450	7.40						0.00
4/9/2009	1515	7.40						0.00
4/14/2009	1025	7.40						0.00
4/21/2009	900	7.40						0.00

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)*
2/2/2009	1415	6.32						0.00
2/9/2009	1130	6.32						0.00
2/19/2009	1005	6.32						0.00
2/23/2009	935	6.32						0.00
3/3/2009	1300	6.32						0.00
3/10/2009	940	6.32						0.00
3/19/2009	845	6.25						0.07
3/27/2009	1110	6.32						0.00
4/1/2009	1450	6.32						0.00
4/9/2009	1515	6.32						0.00
4/14/2009	1025	6.32						0.00
4/21/2009	900	6.32						0.00

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)***
2/2/2009	1415	9.33						0.00
2/9/2009	1130	9.33						0.00
2/19/2009	1005	9.33						0.00
2/23/2009	935	9.33						0.00
3/3/2009	1300	9.33						0.00
3/10/2009	940	9.33						0.00
3/19/2009	845	9.33						0.00
3/27/2009	1110	9.33						0.00
4/1/2009	1450	9.33						0.00
4/9/2009	1515	9.33						0.00
4/14/2009	1025	9.33						0.00
4/21/2009	900	9.33						0.00

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)***
2/2/2009	1415	7.98						0.00
2/9/2009	1130	7.98						0.00
2/19/2009	1005	7.98						0.00
2/23/2009	935	7.98						0.00
3/3/2009	1300	7.98						0.00
3/10/2009	940	7.98						0.00
3/19/2009	845	7.88						0.10
3/27/2009	1110	6.62	6.6	22.58	0.943	0.53	-158.8	1.36
4/1/2009	1450	6.20						1.78
4/9/2009	1515	7.50						0.48
4/14/2009	1025	7.82						0.16
4/21/2009	900	7.98						0.00

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)***
2/2/2009	1415	10.99						0.46
2/9/2009	1130	11.00						0.45
2/19/2009	1005	11.02						0.43
2/23/2009	935	11.02						0.43
3/3/2009	1300	11.04						0.41
3/10/2009	940	11.03						0.42
3/19/2009	845	11.06						0.39
3/27/2009	1110	11.04						0.41
4/1/2009	1450	11.06						0.39
4/9/2009	1515	11.45						0.00
4/14/2009	1025	11.04						0.41
4/21/2009	900	11.21						0.24
.								

NA = Not Available

Table 8.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 8

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)***
2/2/2009	1415	11.85						0.49
2/9/2009	1130	11.85						0.49
2/19/2009	1005	11.84						0.50
2/23/2009	935	11.85						0.49
3/3/2009	1300	11.85						0.49
3/10/2009	940	11.83						0.51
3/19/2009	845	11.8						0.54
3/27/2009	1110	11.93						0.41
4/1/2009	1450	11.84						0.50
4/9/2009	1515	11.85						0.49
4/14/2009	1025	11.85						0.49
4/21/2009	900	11.92						0.42

NA = Not Available

Table 8.1.2 SWMU B-3 Trench 1 and 2 Quarter 8 - VOC Analytical Summary Table

Q8	B3 T1-1			B3 T1-2			B3 T1-3			B3 T2-1		
Date	**2/19/09**	**3/19/09**	**4/21/09**	**2/19/09**	**3/19/09**	**4/21/09**	**2/19/09**	**3/19/09**	**4/21/09**	**2/19/09**	**3/19/09**	**4/21/09**
PCE (µg/L)	0	0	0	0	0	0	0	0	0	1.5	0.97	1.3
TCE (µg/L)	0.34	0.33	0	1.2	0.42	0	0.34	0.33	0	0.82	1.1	1.1
cis-1,2-DCE (µg/L)	1.6	1.2	2	3.8	2.8	1.7	1.6	1.2	2	47	74	54
trans-1,2-DCE (µg/L)	8	6.1	3.9	3.4	3.2	2.5	8	6.1	11	0	0.81	0.48
Vinyl Chloride (µg/L)	4.1	25	4.1	19	21	0	4.1	25	27	0	0.98	4.8
Ethene (µg/L)	10.3	10.4	4.73	5.65	5.71	3.21	10.3	10.4	13.1	0	0	0
PCE (nM/L)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.045	5.849	7.839
TCE (nM/L)	2.588	2.512	0.000	9.133	3.197	0.000	2.588	2.512	0.000	6.241	8.372	8.372
cis-1,2-DCE (nM/L)	16.503	12.378	20.629	39.195	28.881	17.535	16.503	12.378	20.629	484.786	763.280	556.988
trans-1,2-DCE (nM/L)	82.517	62.919	40.227	35.070	33.007	25.786	82.517	62.919	113.461	0.000	8.355	4.951
Vinyl Chloride (nM/L)	65.590	399.936	65.590	303.951	335.946	0.000	65.590	399.936	431.931	0.000	15.677	76.788
Ethene (nM/L)	367.201	370.766	168.627	201.426	203.565	114.439	367.201	370.766	467.023	0.000	0.000	0.000
Total Molar Conc. (nM/L)	534.399	848.511	295.073	588.776	604.595	157.760	534.399	848.511	1,033.044	500.072	801.534	654.938
% moles PCE	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	1.809%	0.730%	1.197%
% moles TCE	0.484%	0.296%	0.000%	1.551%	0.529%	0.000%	0.484%	0.296%	0.000%	1.248%	1.045%	1.278%
% moles cis-1,2-DCE	3.088%	1.459%	6.991%	6.657%	4.777%	11.115%	3.088%	1.459%	1.997%	96.943%	95.227%	85.044%
% moles trans-1,2-DCE	15.441%	7.415%	13.633%	5.956%	5.459%	16.345%	15.441%	7.415%	10.983%	0.000%	1.042%	0.756%
% moles Vinyl Chloride	12.274%	47.134%	22.228%	51.624%	55.565%	0.000%	12.274%	47.134%	41.811%	0.000%	1.956%	11.724%
% moles Ethene	68.713%	43.696%	57.148%	34.211%	33.670%	72.540%	68.713%	43.696%	45.208%	0.000%	0.000%	0.000%
sum % moles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Month 22	Month 23	Month 24	Month 22	Month 23	Month 24	Month 22	Month 23	Month 24	Month 22	Month 23	Month 24

Note: 0 sample indicates a non-detect analyte value

Q8		B3																					
Well ID		**B3 T1-1**						**B3 T1-2**						**B3 T1-3**						**B3 T2-1**					
Sample Date		**2/19/2009**		**3/19/2009**		**4/21/2009**		**2/19/2009**		**3/19/2009**		**4/21/2009**		**2/19/2009**		**3/19/2009**		**4/21/2009**		**2/19/2009**		**3/18/2009**		**4/21/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	1.0	B	2.6		2.2		1.1	B	4.6		2.9		1.8	B	2.8		3.3		3.4	B	4.2		3.4	
Total Organic Carbon	mg/L	3.0		3.4		4		1.9		5.6		4.4		2.4		4.4		3.2		3.4		4.2		3.5	
Methane	µg/L	794		535		1,140		2,640		2,710		4,570		9,110		5,950		3,630		213		476		493	
Ethene	µg/L	0		0		2.31		5.65		5.71		3.21		14.2		10.3		4.73		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	248,000		243,000		326,000		216,000		208,000		278,000		227,000		197,000		328,000		39,200		130,000		211,000	
Alkalinity, Total (as CACO3)	mg/L	531		556		502		520		545		591		471		506		609		478		508		468	
Nitrate/Nitrite	mg/L	0		0.035	J	0		0		0.035	J	0		0		0.035	J	0		0.13		0.035	J	0.067	J
Sulfate	mg/L	44.0		25.9		37.7		37.8		69.5		7.7		2.9		1.6		3.7		43.1		37.1		33.3	
Chloride	mg/L	15.3		15.4		15.2		15.4		15.3		15.2		14.9		16.0		15.2		14.9		15.7		15	
Ferrous Iron	mg/L	1.3		2.0		2.2		2.0		1.9		3.3		1.3		2.2		3.1		1.1		3.0		2.0	
Manganese	µg/L	255		151		150		128		166		210		242		320		345		239		130		290	
Hydrogen	nM/L	1.9		1.3		1.9		1.7		1.3		6.9		4.2		1.3		2.1		1.6		1.3		0.84	
Hydrogen Sulfide																									
Total Dissolved Solids	mg/L	534		524		505		516		617		549		450		455		501		479		496		475	
Benzene	µg/L	0		0		0		0		0		0.36	J	0		0		0.27	J	0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	55		55		20		3.8		2.8		1.7		1.6		1.2		2.0		47		74		54	
Dichloroethene, trans-1,2-	µg/L	4.0		6.80		4.50		3.4		3.2		2.5		8.1		6.1		3.9		0		0.81		4.80	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	1.4		0.36	J	0		0		0		0		0		0		0		1.5		0.97	J	1.30	J
Toluene	µg/L	0		0.19	J	0		0		0		0.51	J	0.44	J	0.23	J	0.76	J	0		0		0	
Trichloroethene	µg/L	25		6.6		0.32	J	1.2		0.42	J	0		0.34	J	0.33	J	0		0.82	J	1.1		1.1	
Vinyl chloride	µg/L	18		25		21		19		21		0		16		25		4.1		0		0.98	J	0	
Arsenic	µg/L	5.3		0		0		3.7	J	0		0		0		0		0		5.0		0		0	
Barium	µg/L	79.6		70.1		58.9		69.8		72.1		87.9		104		98.1		128		134		119		104	
Cadmium	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Chromium	µg/L	1.4	J	0		0		1.4	J	0		0		1.4	J	0		0		1.5	J	0		0	
Copper	µg/L	0		0		0		1.4	J	1.3	J	1.1	J	0		0		0		1.9	J	1.2	J	1.5	J
Lead	µg/L	0		0		0		0		0		2.5	J	0		0		2.0	J	0		0		0	
Mercury	µg/L	0.41	B	0		0.20	B	0.45	B	0		0.21	B	0.58	B	0		0.23	B	0.52	B	0		0.20	B
Nickel	µg/L	0		0		1.2	J	0		0		0		0		0		0		1.2	J	0		1.1	J
Zinc	µg/L	59.0		0		11.6	J	27.3	J	0		49.4	J	22.6	J	0		76.7		37.6	J	0		57.6	
		Month 22		Month 23		Month 24		Month 22		Month 23		Month 24		Month 22		Month 23		Month 24		Month 22		Month 23		Month 24	

Note: 0 sample indicates a non-detect analyte value

Table 8.2.2

SWMU B-3 Westbay Monitoring Wells
Upper Saturated Zone (Zone LGR03B) Analytical Results Summary Quarter 8

Q8	CS-WB05-LGR03B			CS-WB06-LGR03B			CS-WB07-LGR03B			CS-WB08-LGR03B		
Date	**2/17/09**	**3/18/09**	**4/20/09**	**2/18/09**	**3/18/09**	**4/20/09**	**2/18/09**	**3/18/09**	**4/20/09**	**2/18/09**	**3/18/09**	**4/21/09**
PCE (µg/L)	0	0	0	72	87	59	0	1.6	0	27	20	110
TCE (µg/L)	0	0.18	0	110	130	82	4.3	4.2	1.6	36	23	160
cis-1,2-DCE (µg/L)	100	60	45	170	150	150	25	23	14	40	28	170
trans-1,2-DCE (µg/L)	16	8.3	11	1.5	1.8	11	0.85	0.51	2.6	0.94	2.1	10.0
Vinyl Chloride (µg/L)	0	0	0	0	0	0	0	0	0	0	0	0
Ethene (µg/L)	0	0	0	0	0	0	0	0	0	0	0	0
PCE (nM/L)	0.000	0.000	0.000	434.180	524.634	355.786	0.000	9.648	0.000	162.817	120.605	663.330
TCE (nM/L)	0.000	1.370	0.000	837.202	989.421	624.096	32.727	31.966	12.177	273.993	175.051	1217.749
cis-1,2-DCE (nM/L)	1031.460	618.876	464.157	1753.481	1547.189	1547.189	257.865	237.236	144.404	412.584	288.809	1753.481
trans-1,2-DCE (nM/L)	165.034	85.611	113.461	15.472	18.566	113.461	8.767	5.260	26.818	9.696	21.661	103.146
Vinyl Chloride (nM/L)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ethene (nM/L)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Molar Conc. (nM/L)	1,196.493	705.857	577.617	3,040.335	3,079.810	2,640.532	299.359	284.110	183.400	859.090	606.126	3,737.706
% moles PCE	0.000%	0.000%	0.000%	14.281%	17.035%	13.474%	0.000%	3.396%	0.000%	18.952%	19.898%	17.747%
% moles TCE	0.000%	0.194%	0.000%	27.537%	32.126%	23.635%	10.932%	11.251%	6.640%	31.893%	28.880%	32.580%
% moles cis-1,2-DCE	86.207%	87.677%	80.357%	57.674%	50.237%	58.594%	86.139%	83.501%	78.737%	48.026%	47.648%	46.913%
% moles trans-1,2-DCE	13.793%	12.129%	19.643%	0.509%	0.603%	4.297%	2.929%	1.852%	14.623%	1.129%	3.574%	2.760%
% moles Vinyl Chloride	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
% moles Ethene	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
sum % moles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Month 22	Month 23	Month 24	Month 22	Month 23	Month 24	Month 22	Month 23	Month 24	Month 22	Month 23	Month 24

Table 8.2.3a

SWMU B-3 Bioreactor Multi-port Well CS-WB05 - Q8 Performance Data

Q8		WB05																	
Well ID		**CS-WB05-LGR01**		**CS-WB05-LGR03B**						**CS-WB05-LGR04A**		**CS-WB05-LGR04B**		**CS-WB05-BS-01**		**CS-WB05-CC-01**		**CS-WB05-CC-02**	
Sample Date		**4/29/2009**		**2/17/2009**		**3/18/2009**		**4/20/2009**		**4/29/2009**		**4/29/2009**		**4/29/2009**		**4/28/2009**		**4/28/2009**	
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	0.17	J	0.18	J	0.76		18.6		0.50		1.1		0.20	J	0.48	J	0	
Total Organic Carbon	mg/L	0.57		0		1.2		20.0		0.95		1.5		0.84		0		0.24	J
Methane	µg/L	39.6		2,970		766		1060		5030		12,200		25.7		7.6		203	
Ethene	µg/L	0		0		0		0		0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	7,860		40,400		21,900		20,600		49,300		131,000		11,000		20,400		14,200	
Alkalinity, Total (as CACO3)	mg/L	436		606		386		370		390		454		328		319		342	
Nitrate/Nitrite	mg/L	0.069	J	0.00		0.035	J	0		0.065	J	0.14		0.05	J	0.12		0.067	J
Sulfate	mg/L	92.9		48.6		48.8		47.3		20.4		3.7		33.1		82.4		93.4	
Chloride	mg/L	14		11.9		12.2		12.1		11.9		12.6		12.1		17.3		18.2	
Ferrous Iron	mg/L	0		0		0		0.29	J	0.19	J	0.31	J	0		0.20	J	0.17	J
Manganese	µg/L	2.2	J	3.4	J	0		0		8.4		38.8		0		0		0	
Hydrogen	nM																		
Hydrogen Sulfide																			
Total Dissolved Solids	mg/L	540		419		403		393		399		437		364		433		436	
Benzene	µg/L	0		0		0		0		0		0.19	J	0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0.4	J	0		0		0	
Dichloroethene, cis-1,2-	µg/L	1.5		100		60		45		430		800		17		5.7		45	
Dichloroethene, trans-1,2-	µg/L	0		16		8.3		11		12		15		0.64		0		3.3	
Methylene chloride	µg/L	0		0		0		0		0		1.3	B	0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0		0		0		0		0.65	J	63		0		4.6		0.33	J
Toluene	µg/L	0		0		0		0		0		0		0		0		0	
Trichloroethene	µg/L	2.4		0		0.18	J	0		170		120		7.3		18		63	
Vinyl chloride	µg/L	0		0		0		0		0		2.4		0		0		0.66	J
Arsenic	µg/L	0		0		0		0		0		15.9		0		0		0	
Barium	µg/L	28.3		34.8		31.1		32		35.6		24.1		30.2		23.9		20.6	
Cadmium	µg/L	0		0		0		0		0		0		0.97	J	0		0	
Chromium	µg/L	26.8		22.1		5.4		10.7		24.5		6.2		2.6	J	19.1		7.8	
Copper	µg/L	0		1.9	J	0		1.3	J	0		0		0		0		0	
Lead	µg/L	0		3.5	J	0		2.7	J	0		0		0		0		0	
Mercury	µg/L	0.18	BJ	0.079	J	0		0.16	BJ	0.18	BJ	0.24	B	0.18	BJ	0		0	
Nickel	µg/L	22.8		13.5		0		5.8		17.6		69.3		2.2	J	14.2		3.5	J
Zinc	µg/L	27.6	J	0		0		10.1	J	22.2	J	19.2	J	27.2	J	9.6	J	0	
		Q8- Month 24		Month 22		Month 23		Month 24		Q8- Month 24		Q8 - Month 24		Q8 - Month 24		Q8 - Month 24		Q8- Month 24	

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

Note: CS-WB05-CC-01 sample from 1/22/08 likely contained water from the inner part of the well due to catastrophic failure of the shoe on the Westbay probe during sampling

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

Table 8.2.3b SWMU B-3 Bioreactor Multi-port Well CS-WB06 - Q8 Performance Data

Q8		WB06															
Well ID		**CS-WB06-UGR01**		**CS-WB06-LGR01**		**CS-WB06-LGR02**		**CS-WB06-LGR03A**		**CS-WB06-LGR03B**						**CS-WB06-LGR04**	
Sample Date		**4/23/2009**		**4/23/2009**		**4/23/2009**		**4/22/2009**		**2/18/2009**		**3/18/2009**		**4/20/2009**		**4/22/2009**	
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		0.44	J	0.36	J	0.24	J					0.54		0.21	J
Total Organic Carbon	mg/L	1.6		0.68		0.38	J	0.97						0.42	J	0.17	J
Methane	µg/L	131		0		0		0						0		0	
Ethene	µg/L	0		0		0		0						0		0	
Ethane	µg/L	0		0		0		0						0		0	
Carbon Dioxide	µg/L	184,000		11,900		11,400		18,700						24,500		24,000	
Alkalinity, Total (as CACO3)	mg/L	518		376		346		337						341		337	
Nitrate/Nitrite	mg/L	0.82		0		0.12		1.0						0.12		0	
Sulfate	mg/L	6.9		19.5		24.6		17.6						17.9		10.2	
Chloride	mg/L	16.7		12.8		10.3		12.0						12		12.9	
Ferrous Iron	mg/L	0		0		0		0						0		0	
Manganese	µg/L	837		0		0		0						0		0	
Hydrogen	nM																
Hydrogen Sulfide																	
Total Dissolved Solids	mg/L	468		366		345		341		360		336		333		307	
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		0.19	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		0		0.48	J
Dichloroethene, cis-1,2-	µg/L	2.6		27		33		210		170		150		150		310	
Dichloroethene, trans-1,2-	µg/L	3.2		2.4		3.1		9.0		1.5		1.8		11		28	
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	0.53	J	22		13		87		72		87		59		200	
Toluene	µg/L	0		0		0		0		0		0		0		0	
Trichloroethene	µg/L	0.43	J	27		15		120		110		130		82		160	
Vinyl chloride	µg/L	1.2		1.4		0		0		0		0		0		0	
Arsenic	µg/L	0		0		0		2.6	J					0		0	
Barium	µg/L	80.3		58.0		68.5		30.9						29.7		30.4	
Cadmium	µg/L	0		0		0		0						0		0	
Chromium	µg/L	10.8		3.7	J	5.1		8.7						4.9	J	10.6	
Copper	µg/L	0		0		0		0						0		0	
Lead	µg/L	0		3.5	J	2.4	J	1.8	J					1.6	J	0	
Mercury	µg/L	0		0		0		0						0.18	BJ	0	
Nickel	µg/L	24.1		2.2	J	4.7	J	7.5						4.9	J	6.3	
Zinc	µg/L	58.5		58.8		64.1		68.8						21.9	J	58.2	
		Q8 - Month 24		Q8 - Month 24		Q8 - Month 24		Q8 - Month 24		Month 22		Month 23		Month 24		Q8 - Month 24	

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

Table 8.2.3c SWMU B-3 Bioreactor Multi-port Well CS-WB07 - Q8 Performance Data

Q8		WB07													
Well ID		**CS-WB07-LGR01**		**CS-WB07-LGR-02**		**CS-WB07-LGR-03A**		**CS-WB07-LGR-03B**						**CS-WB07-LGR-04**	
Sample Date		**4/28/2009**		**4/27/2009**		**4/27/2009**		**2/18/2009**		**3/18/2009**		**4/20/2009**		**4/23/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.60		1.4		0.65		0		0.61		0.96		0.15	J
Total Organic Carbon	mg/L	0.38	J	0.88		0.61		0		1.3		0.45	J	0.39	J
Methane	µg/L	1.53		0.164		0.945		5.52		3.58		26.6		0.309	J
Ethene	µg/L	0		0		0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	103,000		9,890		8,860		25,700		18,800		25,900		33,300	
Alkalinity, Total (as CACO3)	mg/L	478		363		329		343		351		347		341	
Nitrate/Nitrite	mg/L	0.093	J	0.041	J	0.092	J	0.034	J	2.1		0.043	J	0	
Sulfate	mg/L	86.1		36.8		19.5		20.1		20.1		19.7		9.9	
Chloride	mg/L	16.5		13.2		10.0		10.2		10.4		10.2		12.0	
Ferrous Iron	mg/L	0		0.24	J	0		0		1.7		0		0	
Manganese	µg/L	3.9	J	0		0		0		0		0		0	
Hydrogen	nM														
Hydrogen Sulfide															
Total Dissolved Solids	mg/L	577		392		349		343		334		333		314	
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	
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		0.43	J
Dichloroethene, cis-1,2-	µg/L	1.5		0		24		25		23		14		310	
Dichloroethene, trans-1,2-	µg/L	0		0		1.8		0.85		0.51	J	2.6		18	
Methylene chloride	µg/L	0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.24	J	0.26	J	0.33	J	0		1.6		0		200	
Toluene	µg/L	0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.0		0		4.3		4.3		4.2		1.6		210	
Vinyl chloride	µg/L	0		0		0		0		0		0		0	
Arsenic	µg/L	0		0		0		0		0		0		0	
Barium	µg/L	107		94.5		35.5		33.4		32.3		33.9		27.2	
Cadmium	µg/L	0		0		0		0		0		0		0	
Chromium	µg/L	13.8		7.6		21.9		8.4		2.7	J	4.4	J	10.0	
Copper	µg/L	0		0		0		1.2	J	0		0		0	
Lead	µg/L	0		0		0		3.5	J	0		2.0	J	0	
Mercury	µg/L	0.072	J	0.15	J	0.16	J	0.074	J	0		0.16	BJ	0	
Nickel	µg/L	12		4.3	J	13.1		5.5		0		2.4	J	7.0	
Zinc	µg/L	2.4	J	8.4	J	688		12.2	J	0		8.0	J	59.8	
		Q8 - Month 24		Q8 - Month 24		Q8 - Month 24		Month 22		Month 23		Month 24		Q8 - Month 24	

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

Table 8.2.3d SWMU B-3 Bioreactor Multi-port Well CS-WB08 - Q8 Performance Data

Q8		WB08											
Well ID		**CS-WB08-LGR01**		**CS-WB08-LGR02**		**CS-WB08-LGR03B**						**CS-WB08-LGR04**	
Sample Date		**4/22/2009**		**4/21/2009**		**2/18/2009**		**3/18/2009**		**4/21/2009**		**4/21/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.37	J	0.55						0.29	J	0.87	
Total Organic Carbon	mg/L	0.48	J	0.25	J					0.29	J	0.70	
Methane	µg/L	0		5.19						0		0	
Ethene	µg/L	0		0						0		0	
Ethane	µg/L	0		0						0		0	
Carbon Dioxide	µg/L	6,840		21,500						26,100		170,000	
Alkalinity, Total (as CACO3)	mg/L	394		402						333		485	
Nitrate/Nitrite	mg/L	0.32		0						0.53		0.22	
Sulfate	mg/L	94.3		89.2						17.5		11.1	
Chloride	mg/L	10.5		11.3						11.2		15.3	
Ferrous Iron	mg/L	0		0						0		0	
Manganese	µg/L	0		0						0		0	
Hydrogen	nM												
Hydrogen Sulfide													
Total Dissolved Solids	mg/L	520		493		389		354		343		452	
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		0		0		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	19		11		40		28		170		44	
Dichloroethene, trans-1,2-	µg/L	5.1		5.1		0.94		2.1		10		18	
Methylene chloride	µg/L	0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.16	J	3.9		27		20		110		8.9	
Toluene	µg/L	0		0		0		0		0		0	
Trichloroethene	µg/L	1.3		4.6		36		23		160		6.7	
Vinyl chloride	µg/L	0		0		0		0				0	
Arsenic	µg/L	0		0						0		0	
Barium	µg/L	103		55.4						33.3		54.5	
Cadmium	µg/L	0		0						0		0	
Chromium	µg/L	5.3		7.3						2.3	J	3.6	J
Copper	µg/L	0		0						0		0	
Lead	µg/L	1.9	J	1.9	J					1.7	J	1.6	J
Mercury	µg/L	0		0.25	B					0.20	B	0.24	B
Nickel	µg/L	3.2	J	3.1	J					10.1		3.5	J
Zinc	µg/L	55.5		10.7	J					38.4	J	49.6	J
		Q8 - Month 24		Q8 - Month 24		Month 22		Month 23		Month 24		Q8 - Month 24	

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

Note: Dry zones including UGR01 and LGR03A were not sampled during the quarterly sampling event.

Q8 **Monitoring Wells**

Well ID		CS-MW16-LGR		CS-MW1-LGR		CS-B3-MWO1		CS-MW16-CC	
Sample Date		4/20/2009		4/20/2009		4/20/2009		4/20/2009	
Compound	Units	Value	Flag	Value	Flag	Value	Flag	Value	Flag
Dissolved Organic Carbon	mg/L	0.66		0.32	J	14.8		0.84	
Total Organic Carbon	mg/L	0.28	J	0.29	J	19.1		0.29	J
Methane	µg/L	17.80		0		13,800		7.00	
Ethene	µg/L	0		0		0		0	
Ethane	µg/L	0		0		0		0	
Carbon Dioxide	µg/L	50,900		438,000		377,000		27,600	
Alkalinity, Total (as CACO3)	mg/L	341		308		1470		334	
Nitrate/Nitrite	mg/L	1.1		0.79		0.025	J	0	
Sulfate	mg/L	17.8		13.4		3.2		58.0	
Chloride	mg/L	10.6		9.2		14.0		16.6	
Ferrous Iron	mg/L	0		0		5.3		0.34	J
Manganese	µg/L	0		3.4	J	250		1.6	J
Hydrogen	nM			1.6		0.91		14	
Hydrogen Sulfide									
Total Dissolved Solids	mg/L	325		300		1430		395	
Benzene	µg/L	0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0	
Bromoform	µg/L	0		0		0		0	
Chloroform	µg/L	0.14	J	0.14	J	0		0	
Dibromochloromethane	µg/L	0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	150		17		160		34	
Dichloroethene, trans-1,2-	µg/L	1.7		1.4		9.6		3.4	
Methylene chloride	µg/L	0		0		0		0	
Naphthalene	µg/L	0		0		0		0	
Tetrachloroethene	µg/L	150		13		0		7.7	
Toluene	µg/L	0		0		0		0	
Trichloroethene	µg/L	180		28		0		48	
Vinyl chloride	µg/L	0		0		3.7		0	
Arsenic	µg/L	0		0		10.3		0	
Barium	µg/L	38.1		35.5		742		24.1	
Cadmium	µg/L	0		0		0.71	J	0	
Chromium	µg/L	0		4.3	J	4.9	J	1.6	J
Copper	µg/L	15.0		2.4	J	0		11.2	J
Lead	µg/L	0		0		26.9		38.4	
Mercury	µg/L	0.073	J	0.077	J	0.080	J	0.13	J
Nickel	µg/L	0		9.1		17.3		14.9	
Zinc	µg/L	83.4		0		132		1290	
		Quarter 8 - Month 24		Quarter 8 - Month 24		Quarter 8 - Month 24		Quarter 8 - Month 24	

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

Table 8.4.4

SWMU B-3 Sump and Monitoring Well Microbial Data Quarter 8

Trench Sump	Sample date:	2/29/09	3/19/2009	4/21/2009
B3 T1-1				
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)			4.32E+03
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)			3.07E+03
BAV1 VC R-Dase (1)	(cells/mL)			5.00E-01
VC R-Dase	(cells/mL)			7.84E+02
B3 T1-2				
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)	8.73E + 02	5.59E+02	7.24E+02
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)	5.97E+02	2.01E+02	2.56E+02
BAV1 VC R-Dase (1)	(cells/mL)	<5.00E-01	<5.00E-01	2.00E-01 (J)
VC R-Dase	(cells/mL)	3.33E+02	1.91E+02	2.08E+02
B3 T1-3				
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)			1.42E+03
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)			2.38E+02
BAV1 VC R-Dase (1)	(cells/mL)			4.29E+02
VC R-Dase	(cells/mL)			6.50E+02
B3 T2-1				
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)	2.24E+02		7.22E+01
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)	1.20E+00		1.16E+01
BAV1 VC R-Dase (1)	(cells/mL)	<5.00E-01		9.00E-01
VC R-Dase	(cells/mL)	9.00E-01		2.00E-01 (J)

Monitoring Well		CS-MW 16-LGR	CS-MW16-CC	CS-MW01-LGR
	Sample date:	4/20/2009	4/20/2009	4/20/2009
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)	4.80E+00	2.80E+00	3.00E+00
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)	1.00E-01(J)	<3.00E-01	1.00E-01(J)
BAV1 VC R-Dase (1)	(cells/mL)	5.30E+00	8.00E-01	1.80E+00
VC R-Dase	(cells/mL)	1.00E+00	4.00E-01	3.00E-01