

August 27, 2010

Michael J. Hinton P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Ave.
Buffalo, NY 14203-2999

Re: Carborundum Global Site No. 932036
Town of Niagara, Niagara County
Pilot Test and Spring 2010 Annual Report

Dear Mr. Hinton:

Enclosed is the Bioremediation Pilot Test and Spring 2010 Annual Groundwater Monitoring Report. The pilot test, performed in both overburden and bedrock groundwater systems, was conducted in two phases, from July 2008 through May 2010. As agreed, this report also contains results from the Spring 2010 annual groundwater monitoring event. The Five-Year Review report will be submitted to you in the fourth quarter of 2010, and will contain a more detailed analysis of the groundwater conditions.

If you have any questions, feel free to contact William Barber at (216) 271-8038.

Sincerely,



Mark Raybuck
Project Manager

cc: W. Barber

BIOREMEDIATION PILOT TEST AND SPRING 2010 ANNUAL GROUNDWATER MONITORING REPORT

Former Carborundum Company, Hyde Park Facility
(NYSDEC Site No. 932036)
3425 Hyde Park Boulevard
Town of Niagara, Niagara County, New York

Prepared for:



New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
270 Michigan Avenue
Buffalo, New York 14203

Submitted by:

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A BP affiliated company

4850 East 49th Street
Cuyahoga Heights, Ohio 44125

Prepared by:

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August 2010

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SECTION 1 PROJECT DESCRIPTION

1.1 INTRODUCTION

The Former Carborundum Company Hyde Park Facility (Site) is located at 3425 Hyde Park Blvd. in the Town of Niagara, New York (**Figure 1.1**). This report describes the methods and results of a pilot test that were performed to assess the applicability and feasibility of *in situ* bioremediation for chlorinated compounds of concern (COCs) in groundwater at the Site. Work reported in this document was completed in accordance with the Pilot Test Work Plan for *In Situ* Treatment Using Enhanced Bioremediation (Parsons, 2008). A preliminary report containing the results of the initial overburden pilot test was submitted to NYSDEC on July 30, 2009.

This report also includes results from the Spring 2010 annual groundwater monitoring event. The work was conducted in accordance with 1) the New York State Department of Environmental Conservation (NYSDEC)-approved groundwater monitoring work plan (DE&S, 2000), 2) correspondence from NYSDEC dated September 28, 2005, 3) a work plan amendment dated April 5, 2010, and 4) NYSDEC's approval letter dated April 23, 2010. Details of the annual monitoring event scope of work and results are presented in Section 5 of this report. A Five-year review report, summarizing the last five years of annual monitoring, and providing an overall Site status update, will be submitted to NYSDEC during the fourth quarter of 2010.

1.2 PILOT TEST OBJECTIVE

The Site is impacted by chlorinated COCs related to historical operations. The potential treatment program being evaluated consists of an organic substrate (emulsified vegetable oil mixed with Site groundwater) injected into the overburden and bedrock groundwater to promote biodegradation of chlorinated COCs. The Site COCs are trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), vinyl chloride (VC), 1,1-dichloroethane (1,1-DCA), and benzene. Benzene is typically below 1 µg/L across the Site; therefore, the discussion in this report focuses on the chlorinated COCs. 1,1-DCA is expected to degrade with the bioremediation application; however, it exists at relatively low concentrations (typically less than 40 µg/L). Therefore, the analysis in this report focuses on chlorinated ethenes.

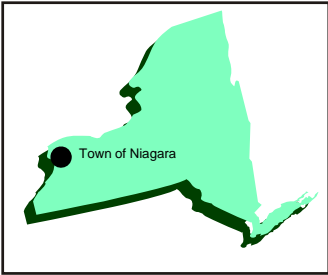
The overall objective of the field-scale pilot tests described in this report was to determine if *in situ* bioremediation is a viable treatment option for chlorinated COCs in groundwater at the Site. A more detailed list of the performance objectives is presented in the results section of this report, along with an assessment of how the results of the pilot test fulfilled the data requirements of each objective.

1.3 SCOPE OF WORK

The pilot test was comprised of two procedures, (1) treatment application and (2) performance monitoring. The treatment application involves all processes and monitoring related to the field application of bioremediation solutions to overburden and bedrock groundwater. Performance monitoring included methods to assess the remedial technology.



SITE



New York



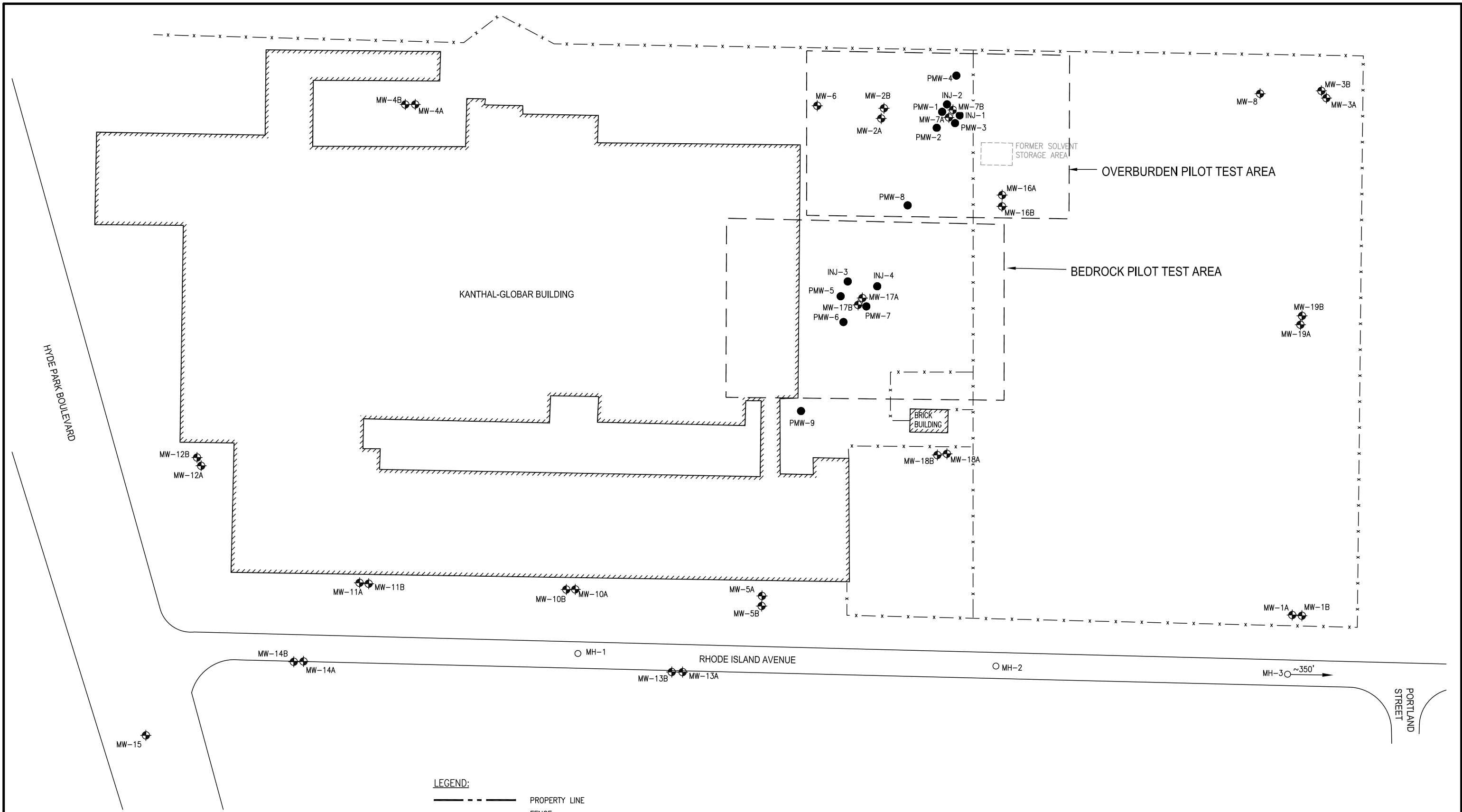
FIGURE 1.1

FORMER CARBORUNDUM CO. ELECTRIC
PRODUCTS DIVISION
TOWN OF NIAGARA, NEW YORK

SITE LOCATION MAP

PARSONS

40 La Riviere Dr., Suite 350, Buffalo, NY 14202



- LEGEND:**
- — — — — PROPERTY LINE
 - x - x - x - x - FENCE
 - ⊕ MW-5A MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
 - ⊕ MW-5B MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
 - PMW-1 PERFORMANCE MONITORING WELL LOCATION
 - INJ-1 INJECTION WELL LOCATION
 - MH-1 MANHOLE (SANITARY SEWER SAMPLE LOCATION)

SOURCE: INTERA, 2006
 HORIZONTAL DATUM: NAD83/96 NEW YORK STATE
 PLANE COORDINATE SYSTEM WEST ZONE.
 VERTICAL DATUM NAVD 88 DATUM

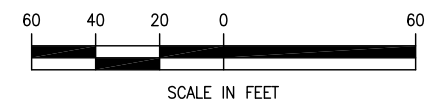


FIGURE 1.2
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NEW YORK
**SITE PLAN AND
 PILOT TEST LAYOUT**

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SECTION 2 PILOT TEST IMPLEMENTATION

2.1 FIELD ACTIVITIES

The pilot test was conducted in phases, with the initial overburden test (Phase 1) started prior to the bedrock test. Following completion of the overburden test, including performance monitoring events, the bedrock pilot test was then conducted along with a second addition of substrate to the overburden (Phase 2).

The following is a timeline of pertinent events completed during the pilot test:

Task	Completion Date
Overburden Monitoring Well Installation Bedrock Well Installation (PMW-8)	July 2008
Phase 1 - Baseline Performance Monitoring	August 2008
Phase 1 - Overburden Substrate Injection	September 4 and 5, 2008
Phase 1 - 4-week Overburden Groundwater Monitoring	October 2008
Phase 1 - Overburden Bioaugmentation	October 21 and 22, 2008
Phase 1 - 13-week Overburden Groundwater Monitoring	December 2008
Phase 1 - 20-week Overburden Groundwater Monitoring	January 2009
Phase 1 - 26-week Overburden Groundwater Monitoring	March 2009
Bedrock Well Installation	September/October 2009
Phase 2 - Baseline Groundwater Monitoring	October 2009
Annual Groundwater Monitoring	October/November 2009
Phase 2 - Bedrock Substrate Injections (INJ-3 and INJ-4).	November 11 and 12, 2009
Phase 2 - Overburden Injections	November 17 and 18, 2009

Task	Completion Date
Phase 2 - 4-week Groundwater Monitoring	December 2009
Phase 2 - Overburden and Bedrock Bioaugmentation	December 17 – 22, 2009
Phase 2 - 13-week Groundwater Monitoring	February 2010
Phase 2 - 20-week Groundwater Monitoring	March/April 2010
Phase 2 - 26-week Groundwater Monitoring	May 2010

2.2 SYSTEM INSTALLATION

System installation for the pilot tests consisted of two injection wells with four performance monitoring wells in the overburden, and two injection wells with five performance monitoring wells in bedrock (see **Figure 1.2** for locations). The well locations for each pilot test were based on areas of highest chlorinated ethene concentrations. Well drilling was conducted in phases to coincide with the two areas / strata at the Site. Six overburden wells (two injection, four monitoring) and a single bedrock monitoring well were installed prior to the overburden pilot test. The remaining six bedrock wells were installed after the overburden pilot test and prior to the bedrock pilot test (see **Appendix A** for boring logs, and the pilot test work plan for details on drilling and well installation procedures).

2.3 TREATMENT AREA CHARACTERIZATION

Prior to injecting the substrate in both the overburden and the bedrock, the treatment areas were characterized for local hydraulic properties, chlorinated ethene concentrations, and microbiological and geochemical indicator parameters. The following activities were conducted as part of the characterization work:

- Local groundwater hydraulics were characterized through periodic water level measurements, observations made during well drilling, geophysical testing, packer testing, well fluid replacement tests, and video logging. Results of the hydraulic testing are included in the hydrogeology discussion in Section 3.1 (see **Appendix B** for details).
- Baseline Sampling - groundwater sampling was completed prior to the substrate injection for both the overburden and bedrock pilot tests. Results are presented in Section 3.4. Well purging data and field measurements are presented in **Appendix D**.

2.4 TREATMENT AREA APPLICATION

An underground injection control permit was obtained from the United States Environmental Protection Agency (USEPA) prior to application of the substrate.

Preceding the substrate injections, pressure transducers were deployed in multiple wells surrounding the injection points to measure and record changes in pressure, water level elevation, and specific conductivity during substrate injection.

As described in Section 2.1, two injection events were conducted in the overburden soils (September 2008 and November 2009), and a single injection event was conducted in the bedrock formation (November 2009).

2.4.1 Overburden

The pilot test in the overburden was performed in accordance with the work plan (Parsons, 2008). The injected substrate mixture consisted of Site groundwater and SRS[®] vegetable oil emulsion product. SRS[®] is a commercial product from Terra Systems, Inc. that consists of approximately 60% vegetable oil and 40% water, along with emulsifying additives and nutrients. During the second injection event (Phase 2), the SRS was modified such that ionic emulsifiers were used to enhance sorption of the vegetable oil to the soils. Details of the substrate injection volumes and loading rates are provided in **Tables 2.2A and B**.

A pH buffer was included in the injection mixture during the injection of a bioaugmentation culture at 4 weeks after the 2008 substrate injection. A target concentration of 4 to 8 mg/L sodium bicarbonate (baking soda) was calculated using the BUCHLORAC geochemical model (Terra Systems written communication 2008). During the 2009 injection events, sodium bicarbonate was included with all the substrate mixtures at similar concentrations.

2.4.2 Bedrock

The bedrock pilot test was conducted near MW-17B in accordance with the work plan. The substrate consisted of Site bedrock groundwater and SRS-FR[®], which is similar to SRS[®] but with a larger emulsion droplet size to limit transport of the emulsion droplets out of the pilot test area. A pH buffer (sodium bicarbonate) was included with the substrate injection at similar concentrations to the overburden injections. Details of the injection volumes and loading rates are provided in **Table 2.2C**.

2.5 PERFORMANCE MONITORING

The effects of the substrate injection and bioaugmentation for each of the two pilot tests (overburden and bedrock) were monitored over time. Performance monitoring events occurred at approximately 4 weeks, 13 weeks, 20 weeks (VOCs only), and 26 weeks after injection of the substrate in each pilot test area.

2.6 BIOAUGMENTATION INJECTIONS

Data from the first performance monitoring event (4 weeks after substrate injection) were evaluated to confirm that a suitable anaerobic environment had been established prior to performing addition of a bioaugmentation culture. The indicators of a suitable environment for bioaugmentation are low DO (less than 1.0 mg/L), a low ORP (less than -100 millivolts [mV]), a neutral pH (between 6 and 8 standard pH units), and sufficient buffering capacity (indicated by alkalinity greater than 300 mg/L as calcium carbonate (AFCEE et al., 2004).

Approximately four to five weeks after each of the injections, the groundwater was augmented with a microbial consortium including both *Dehalococcoides* (DHC) and *Dehalobacter* (DHB) species of bacteria. Details concerning the volumes and composition of the bioaugmentation injection are provided in **Tables 2.2a and 2.2b**.

2.7 WASTE DISPOSAL

Solid investigation-derived waste (IDW) generated during the pilot test was disposed of as non-hazardous material at an approved offsite facility. Purge water was sampled and properly discharged in the sanitary sewer system under a permit with the Niagara Falls Water Board.

Table 2.1
Monitoring Well Construction Specifications
(July 2008- October 2009)

Well #	Date Installed	Northing	Easting	Ground Elevation (ft)	TOC Elevation (ft)	Total Well Depth (ft)	Top of Screen (ft)	Bottom of Screen (ft)
INJ-01	7/9/2008	1136887.35	1028382.49	594.09	596.03	26.3	11.0	26.0
INJ-02	7/7/2008	1136890.67	1028374.60	594.18	595.88	26.5	11.0	26.0
INJ-03	10/2/2009	1136774.58	1028313.26	593.25	592.91	32.5	26.5	32.0
INJ-04	10/20/2008	1136771.36	1028332.70	593.43	593.26	32.0	23.5	31.5
PMW-1	7/9/2008	1136886.28	1028372.29	593.89	596.61	26.0	10.5	25.5
PMW-2	7/9/2008	1136875.46	1028371.75	593.52	595.97	25.0	9.0	24.0
PMW-3	7/9/2008	1136882.58	1028381.51	593.99	595.92	26.5	11.0	26.0
PMW-4	7/2/2008	1136909.81	1028384.66	595.09	597.04	28.0	12.5	27.5
PMW-5	10/2/2008	1136764.78	1028308.68	593.09	592.77	33.0	25.5	32.0
PMW-6	10/2/2008	1136747.75	1028310.43	593.22	592.75	33.0	27.0	32.5
PMW-7	10/2/2008	1136758.01	1028325.48	593.53	593.14	31.0	24.0	30.5
PMW-8	7/11/2008	1136824.49	1028352.65	593.51	593.10	37.5	27.5	37.0
PMW-9	10/2/2008	1136689.23	1028282.56	592.96	592.69	33.0	25.0	32.5

Horizontal orientation based on VA NAD 83 South Zone State Grid
Vertical Datum is based on NAVD 88 Elevations established using GPS methods.

TABLE 2.2a
SUBSTRATE INJECTION AND LOADING RATES
SEPTEMBER 2008 OVERBURDEN INJECTIONS

SUBSTRATE VOLUMES														
Well ID	Injection Points		Substrate Injection Mixture						Water Push	Total Volume		Injection Interval (feet)	Effective Porosity ³ (percent)	Radius of Influence (feet)
	Injection Interval (feet)	Injection Spacing (feet)	Emulsion Volume (gallons)	Product Weight (pounds)	Vegetable Oil Component (gallons)	Vegetable Oil Component (pounds)	Lactic Acid Component (pounds)	Makeup Water (gallons)	Makeup Water (gallons)	Substrate (pounds)	Water/ Substrate (gallons)			
Injection Wells														
INJ-01	11 - 26'	10	40	321	25	192	10.3	470	120	203	630	15	4%	5
INJ-02	11 - 26'	10	28	226	17	136	7.3	330	150	143	508	15	6%	5
SUBTOTAL:			69	546	42	328	18	799	270	345	1,138			
Weight Emulsion Product (lbs):				546										
SUBSTRATE CONCENTRATIONS														
				Substrate Lactic Acid Concentration:		1,854	milligrams per liter							
				Substrate Oil Concentration:		34,601	milligrams per liter		Residual Percent Oil in Substrate Mixture:		3.7%			
BIOAUGMENTATION VOLUMES														
Well ID	Make Up Water (gallons)	Augmentation Solution (pounds)	Emulsion (SRS®) (gallons)	Sodium Bicarbonate (pounds)										
INJ-01	455	2.4	4	15										
INJ-02	455	2.4	2	15										
NOTES: Vegetable Oil Emulsion Product														
1. Emulsion product is 60 percent soybean oil by weight.														
2. Vegetable oil/emulsifier mix is 7.8 pounds per gallon.														
3. Effective porosity revised from injection data (volume only). Breakthrough plots indicate the effective porosity could be lower (approximately 1%).														
4. Bioaugmentation solution contained greater than 1×10^{10} cell/ml of Dehalococcoides (DHC) and Dehalobacter (DHB)														

**TABLE 2.2b
SUBSTRATE INJECTION AND LOADING RATES
NOVEMBER 2009 OVERBURDEN INJECTIONS**

SUBSTRATE VOLUMES													
Well ID	Injection Points		Substrate Injection Mixture				Water Push	Total Volume		Injection Interval (feet)	Estimated	Radius of Influence (feet)	
	Injection Interval (feet)	Injection Spacing (feet)	Emulsion Product Volume (gallons)	Emulsion Product Weight (pounds)	Vegetable Oil Component (gallons)	Vegetable Oil Component (pounds)	Makeup Water (gallons)	Makeup Water (gallons)	Substrate (pounds)		Water/ Substrate (gallons)		Effective Porosity (percent)
Injection Wells													
INJ-01	11-26	10	55	438	33	257	450	57	271	562	15	4%	6.3
INJ-02	11-26	10	55	438	33	257	465	55	271	575	15	6%	5.2
SUBTOTAL:			110	874	66	515	915	112	543	1,137			
SUBSTRATE CONCENTRATIONS													
Substrate Lactic Acid Concentration:				2,972	milligrams per liter		milligrams per liter						
Substrate Oil Concentration:				54,374	milligrams per liter		milligrams per liter		Residual Percent Oil in Substrate Mixture:		5.8%		
BIOAUGMENTATION VOLUMES													
Well ID	Make Up Water (gallons)	Augmentation Solution (liters)	Emulsion (SRS®) (gallons)										
INJ-01	300	3	2										
INJ-02	300	3	2										
Assumptions and Notes: Vegetable Oil Emulsion Product													
1. Assumes emulsion product is 60 percent soybean oil by weight.													
2. Soybean oil/emulsifier mix is 7.8 pounds per gallon.													
3. Ionic surfactant (lecithin) was used in overburden substrate													
4. Groundwater push buffered with sodium bicarbonate.													
5. Porosity based on volume of Fall 2008 injection.													
6. 1 kg of NaBr (sodium bromide) was added to each injections mixture													
7. 17 pounds of sodium bicarbonate (as baking soda) was added to each substrate injection mixture. Sodium Bicarbonate was not added in the augmentation.													
8. Bioaugmentation solution contained greater than 1×10^{10} cell/ml of Dehalococcoides (DHC) and Dehalobacter (DHB)													

**TABLE 2.2c
SUBSTRATE INJECTION AND LOADING RATES
NOVEMBER 2009 BEDROCK INJECTIONS**

Well ID	Injection Points		Substrate Injection Mixture				Water Push		Total Volume		Injection Interval (feet)	Estimated Porosity (percent)	Radius of Influence (feet)
	Injection Interval (feet)	Injection Spacing (feet)	Emulsion Product Volume (gallons)	Emulsion Product Weight (pounds)	Vegetable Oil Component (gallons)	Vegetable Oil Component (pounds)	Makeup Water (gallons)	Makeup Water (gallons)	Substrate (pounds)	Water/ Substrate (gallons)			
Injection Wells													
INJ-03	26 - 33'	20	55	438	33	257	365	60	271	480	8.5	2.2%	10
INJ-04	24 - 33'	20	55	438	33	257	400	50	271	505	8	1.2%	15
SUBTOTAL:			110	874	66	515	765	110	543	985			
SUBSTRATE CONCENTRATIONS													
Substrate Lactic Acid Concentration:				3,430		milligrams per liter							
Substrate Oil Concentration:				62,764		milligrams per liter				Residual Percent Oil in Substrate Mixture: 6.7%			
BIOAUGMENTATION VOLUMES													
Well ID	Make Up Water (gallons)	Augmentation Solution (liters)	Emulsion (SRS®) (gallons)										
INJ-03	300	3.0	2.0										
INJ-04	300	4.7	2.5										
Assumptions: Vegetable Oil Emulsion Product													
1. Assumes emulsion product is 60 percent soybean oil by weight.													
2. Soybean oil/emulsifier mix is 7.8 pounds per gallon.													
3. 1 kg NaBr added to INJ-03 injection volume, 0.85kg NaBr added to INJ-04 injection volume.													
4. 13 lbs of sodium bicarbonate added INJ-03 substrate injection volume, 15 lbs of sodium bicarbonate added INJ-04 substrate injection volume. No sodium bicarbonate was added to the a													
5. Bioaugmentation solution contained greater than 1×10^{10} cell/ml of Dehalococcoides (DHC) and Dehalobacter (DHB)													
6. Effective porosity revised from injection data (volume only). Breakthrough plots indicate the effective porosity could be lower (less than 1%).													

SECTION 3 PILOT TEST RESULTS

3.1 HYDROGEOLOGY

The hydrogeologic setting consists of two water-bearing units: overburden soils and fractured bedrock. Due to the characteristic differences in each unit, this discussion considers the overburden groundwater and bedrock groundwater separately.

3.1.1 Overburden

The overburden unit was a heterogeneous mixture of silt and clay, with minor proportions of sand and gravel. The coarse fractions existed as both embedded grains in the silt and clay, and as lenses. Previous investigations estimated that the geometric mean hydraulic conductivity, based on slug test results, was 4.3×10^{-6} feet per second (ft/sec), or 1.31×10^{-4} centimeters per second (cm/sec) (Intera, 2006).

Results of the drilling and hydraulic testing, including well fluid replacement tests (**Appendix B**) conducted during the pilot test indicated that, within the pilot test area, there are two transmissive zones in the overburden soils. One zone is at approximately 15 to 17 feet below ground surface (bgs), where a sand lens was observed within the silt and clay (see boring logs in **Appendix A**), and another zone exists near the interface between the overburden and bedrock unconformity at approximately 25 to 28 feet bgs, in the overburden area.

Observations during the injection events indicated a hydraulic connection between the overburden and the bedrock units. Dilute concentrations of substrate were observed in MW-7B (screened in bedrock) during the overburden injections. Furthermore, concentrations of total organic carbon (TOC) and acetic acid spiked (increased) in bedrock well MW-17B during the October 2008 4-week performance monitoring event. A potential cause of this spike is the sodium lactate portion of the substrate (miscible in water) migrating with groundwater flow. The significance of this observation is that substrate injections in the overburden formation may also impact and treat the bedrock water bearing unit.

An overburden groundwater contour map was developed based on the May 5, 2010 water levels (**see Table 3.1 and Figure 3.1A**). The overburden groundwater flow direction is to the west/southwest, towards Hyde Park Boulevard and Rhode Island Avenue. The direction of groundwater flow and hydraulic gradient are consistent with historical data.

3.1.2 Bedrock

The bedrock has been previously described as a dolostone and is a member of the Lockport Group. Horizontal fractures vary from open and mineralized to closed. The geometric mean hydraulic conductivity of the bedrock was estimated as 3.43×10^{-5} ft/sec, or 1.05×10^{-3} cm/sec (Intera, 2006).

Results from the installation of bedrock wells and bedrock pilot test field activities were similar to previous studies. Cores were collected and geophysical testing (including optical televiewer) logging was conducted for wells INJ-03, PMW-6, and PMW-9. Observations from the cores and geophysical logs indicated numerous planar fractures in the bedrock. In particular, a series of horizontal fractures, sand lens, and clay seams (presumably weathered shale) were present in each of these wells (see **Appendix C** for details). Total depth drilled into bedrock varied from approximately 9.5 to 11 ft. Top of bedrock was approximately 22 feet bgs in the bedrock pilot test area.

Results from the packer testing at PMW-8 indicate there is lateral hydraulic connection in the bedrock. While pumping groundwater out of core run 1 and run 2, drawdown of 0.25 ft was recorded at MW-16B (62 feet from PMW-8). **Appendix B** contains the time drawdown plots from the PMW-8 packer tests. The hydraulic response was nearly immediate; the head change at MW-16 occurred approximately 45 seconds after the head change in PMW-8. This indicates there is a low storage coefficient to the bedrock groundwater, mostly due to low effective porosity.

A bedrock groundwater potentiometric surface contour map (**Figure 3.1B**) was developed based on the May 5, 2010 water levels. The bedrock groundwater flow direction is generally southwesterly towards Rhode Island Avenue and Hyde Park Boulevard. This is consistent with historical flow directions.

Results from the sampling program indicate that there is a hydraulic connection from the overburden pilot test area to the bedrock pilot test area, and then to MW-11B. Concentrations of total organic carbon (TOC) and acetic acid (55 and 146 ml/l respectively) at MW-17B were above background after the overburden injections. The concentration of bromide, TOC, and acetic acid at MW-11B after the bedrock injections were above background (11.7, 2.7 and 33 mg/L, respectively) during the February 2010 event.

3.2 SUBSTRATE DISTRIBUTION

Distribution of substrate was evaluated primarily through visual observation of emulsified oil, an increase in specific conductivity, and laboratory analysis for total organic carbon (TOC) in groundwater samples.

The pilot tests in both the overburden and bedrock were successful in distributing the substrate throughout the desired treatment area. **Figures 3.3A and 3.3B** show the distribution of groundwater specific conductivity in the overburden and bedrock pilot test areas, respectively. Photos of samples from the pilot test wells, showing relative substrate concentrations, are incorporated into these figures. Based on the specific conductivity and visual measurements, the pilot test areas are interpreted to have attained substrate concentrations in the range of 50 – 80% of the concentration of the injection mixture. Visual observations and photographs of samples from wells indicate the substrate reached the wells, as the samples were white and more viscous than native groundwater.

Real-time monitoring of hydraulic head and specific conductivity was used to track the arrival of the substrate material at the nearby monitoring wells. The substrate break-through plots are provided in **Appendix E**. Using the break-through plots and injection volumes, the effective porosity was estimated at approximately 1% in the overburden area (15 foot saturated thickness) and less than 1% in the bedrock area (7 to 9 feet saturated thickness).

TOC measurements collected during performance monitoring following each pilot test provided further evidence that substrate was distributed throughout the injection areas (see discussion below in Section 3.3 regarding TOC concentrations).

The relatively rapid arrival times of dilute substrate concentrations observed in overburden and bedrock substrate injections suggest a low effective porosity and high degree of connectivity across the pilot test areas. This results in favorable conditions for distributing the substrate in targeted areas.

3.3 REDUCTIONS IN CHLORINATED HYDROCARBONS

Results of both the overburden and bedrock pilot tests indicated that injection of substrate was effective in stimulating biodegradation of chlorinated COCs. A complete pathway for degradation of chlorinated ethenes to ethene was observed in both the overburden and bedrock groundwater systems. Supporting evidence for the effectiveness of the tests is presented below. The primary evidence is the reduction in chlorinated ethene concentrations, as discussed in this section. Secondary evidence, including concentrations of geochemical parameters and microbial populations, is presented in Section 3.4. Tabulated and graphical data presenting laboratory and field analytical results and measurements are provided in **Tables 3.1 to 3.6**, and **Figures 3.4 to 3.8**.

3.3.1 Overburden

Table 3.2 and Figures 3.4A and 3.5A present COC data collected and analyzed during the pilot tests.

TCE has been reduced to isomers of DCE and vinyl chloride at all monitoring locations, to varying degrees. The most significant reduction of chlorinated ethenes in the overburden was observed at MW-7A and PMW-1. At both locations, TCE declined quickly after the initial injection to near the detection limit, and total DCE slowly declined to near or below 50 µg/L (baseline concentrations were 1,840 µg/L at MW-7A and 344 µg/L at PMW-1). Vinyl chloride concentrations were similar at both locations, although there may have been a slight increase after the injections and a decrease at the end of the test. Ethene concentrations increased over time, suggesting that the degradation pathway is, in part, biological.

At locations INJ-01, INJ-02, and PMW-3 the transformation of chlorinated ethenes was less substantial, but the results show that the pathway does exist (Figure 3.4A). Changes in TCE, intermediate compounds (DCE, and VC), and the increases in ethene,

indicate that degradation was enhanced. At INJ-01 and PMW-3, TCE began to increase at the end of the test period, suggesting that TOC concentrations were less than sufficient to continue the transformation of TCE.

Figure 3.5A presents the transformation of the chlorinated ethenes (TCE, DCE, and VC) to ethene, summarizing the progression of the biodegradation pathway over time. During the baseline event, the ratio was biased to the chlorinated ethenes, with ethene at very low concentrations or below detection. Over time, the percentage of chlorinated ethenes decreased and the ethene percentage increased. This represents the biodegradation pathway and suggests that bioremediation is effectively transforming chlorinated ethenes to ethene.

Concentrations of chlorinated ethenes at INJ-1 and PMW-3 slightly increased at the end of the testing period. The increase in TCE and DCE may be related to depletion of TOC and continued influx of contaminated groundwater from an upgradient direction. However, ethene remained elevated, indicating some degradation is still occurring.

Outside the treatment area, concentrations remained elevated. Concentrations at overburden well PMW-2, located 15 feet downgradient of the overburden injection wells, varied from 2,500 to 7,400 µg/L of TCE, 2,700 to 5,800 µg/L of DCE, and 38 to 150 µg/L of VC (**Figure 3.4B**). This well was outside the targeted treatment area; therefore only dilute concentrations of TOC reached this location. The dilute concentrations of TOC were insufficient at causing an observable change in the relatively high concentrations of TCE.

Downgradient of the overburden test area and in the bedrock at PMW-8 (**Figure 3.4B**), concentrations of chlorinated ethenes were lower than at the overburden locations. Vinyl chloride was detected at 130 µg/L, DCE was 92 µg/L, and TCE was below detection limits (1 µg/L). The concentrations generally varied over time with an upward trend of DCE, VC at the end of the test. Ethene concentrations also increased indicating that the degradation path is complete and VC is transforming.

3.3.2 Bedrock

Table 3.2 and Figures 3.4B and 3.5B present COC data collected and analyzed during the pilot tests.

Performance monitoring from the bedrock wells indicated that the bioremediation processes are readily degrading DCE and vinyl chloride to ethene. The baseline and annual sampling events suggest that TCE is nearly absent in the bedrock groundwater, and DCE is the predominant COC. Examples of the degradation of COCs are provided in time series plots in **Figure 3.4B**. The most complete degradation was observed in INJ-4 and MW-17B. Total DCE decreased from 467 to 16 µg/L at INJ-4 and from 639 to 11 µg/L at MW-17B. Vinyl chloride slightly increased during the middle of the test, but decreased to 31 µg/L in INJ-4 and 10 µg/L in MW-17B. Ethene concentrations show that the degradation pathway is complete, as concentrations increased after the substrate injections to as high as 700 µg/L in INJ-4, and 190 µg/L in MW-17B. At other

bedrock locations, (INJ-3, PMW-5, and PMW-7) the changes were moderate, but indicate that degradation is occurring.

Figure 3.5B presents the transformation of the chlorinated ethenes to ethene in the bedrock pilot test area, summarizing the progression of the biodegradation pathway over time. Throughout the test, the percentage of chlorinated VOCs decreased and the percentage of ethene increased. This represents a completed biodegradation pathway, and suggests that bioremediation is effectively transforming COCs to ethene.

3.4 GEOCHEMICAL AND BIOLOGICAL CHANGES

A consistent pattern of geochemical changes was induced as the result of substrate injection. **Tables 3.3 and 3.4 and Figures 3.6A and B** present geochemical data collected during the pilot tests. Results of the microbial population census are presented in **Table 3.6**, and **Figures 3.7A and B**.

3.4.1 Overburden

Geochemical parameters in the overburden samples indicated that biological activity has been stimulated, and that conditions are within an acceptable range for anaerobic degradation of chlorinated COCs to occur (e.g., a decrease in oxidation reduction potential and a stable pH above 6.0). In general, the following conditions are favorable for the biotic reduction of chlorinated ethenes (particularly by *Dehalococcoides* species): pH above 6, low oxidation reduction potential, reduced sulfate, and TOC above 20 mg/L. The following observations indicate that the geochemistry is appropriate for anaerobic biodegradation in the overburden groundwater:

- pH initially dropped to approximately 6.0 after the 2008 substrate injections (no buffer), but quickly rebounded to approximately 7.0 after the 2008 bioaugmentation (with buffer) at 4 weeks. The pH increased after the buffered substrate injection in 2009, and then decreased to between approximately 6.5 and 7.5.
- ORP quickly decreased within the treatment area to approximately negative (-)350 mV and remained this low during the duration of the test.
- Sulfate and TOC, which are inversely related, followed opposite trends in **Figure 3.6C**. Sulfate quickly decreased after the first addition of carbon (organic carbon), and rebounded as TOC was depleted. After the second substrate injection, sulfate decreased and remained below 100 mg/l for the remainder of the test. TOC decreased at a slower rate after the second injection.
- TOC was readily depleted after the first overburden injection (below 40 mg/L after 13 weeks). However, in the second injection, the increase in dosage and use of an ionic surfactant appear to increase the longevity such that TOC was greater than 74 mg/l in three of the five monitoring wells after 26 weeks.

Sampling and analysis of dechlorinating bacteria and reductase enzymes indicated that the microbial populations responded positively to the substrate injections and bioaugmentation. Dechlorinating microorganisms generally increased throughout the test, although there was variability and some anomalous results were observed. Overall, the results suggest that the microbial populations capable of dechlorinating chlorinated ethenes are abundant and support other evidence that dechlorination is occurring through biological pathways (e.g., increase in concentration of ethene).

3.4.2 Bedrock

Geochemical parameter results indicated that biological activity was stimulated, and that conditions were within an acceptable range for anaerobic degradation. The following observations suggested that the groundwater geochemistry is appropriate for bioremediation in the bedrock:

- pH slightly decreased over time but remained in the optimal range of 6.0 – 8.0 in all but one instance (PMW-5 at 5.82 in July, 2009).
- ORP quickly decreased within the treatment area to approximately negative (-)350 mV, and remained below -300 mV for the length of the test, with the exception of INJ-4 which increased to -250 mV.
- Sulfate and TOC, which are inversely related, follow opposite trends as shown on **Figure 3.6C**. Sulfate quickly decreased after the addition of substrate (organic carbon), and remained depleted as TOC ranged from 12.7 to 928 mg/L at the end of the test period.

Sampling and analysis of dechlorinating bacteria and reductase enzymes indicate that the microbial populations responded positively to the substrate injections and bioaugmentation. Dechlorinating microorganisms generally increased throughout the test, although there was variability and some anomalous results. Overall, the results suggest that microbial populations capable of dechlorinating chlorinated ethenes are abundant and support other evidence that dechlorination is occurring through biological pathways.

3.5 LONG-TERM NATURAL ATTENUATION

The purpose of the injections was to increase the rate of existing natural attenuation processes (i.e., biodegradation) such that concentrations of chlorinated ethenes decrease more rapidly. **Figures 3.8A and 3.8B** are long-term trends of chlorinated ethenes and ethene at selected wells, including results after the addition of substrate to groundwater. These figures suggest that (1) natural attenuation has continued as a long-term process that degrades TCE and DCE; and (2) the rate of attenuation increased after the pilot test injections. The following observations support this concept:

- At MW-7A, natural attenuation slowly degraded both TCE and DCE without production of VC or ethene.

- At MW-7A and MW-17B, addition of substrate in 2008 and 2009 appeared to directly enhance biological activity such that the rate of degradation substantially increased.
- Degradation after the substrate injections decreased all chlorinated ethenes to less than 24 µg/L (individual concentrations) at MW-7A, and to less than 11 µg/L (individual concentrations) at MW-17B.
- Downgradient bedrock locations MW-11B and MW-15, showed decreased DCE concentrations over time. After the pilot test injections, the concentrations decreased at a faster rate, to less than 8 µg/L at MW-11B, and to less than 18 µg/L at MW-15. This is likely due to upgradient reductions of COCs (except in PMW-2).

The above observations suggest that bioremediation can be an effective method for reducing COC concentrations in the application area, and increasing the apparent rate of natural attenuation downgradient of the pilot test area.

3.6 EVALUATION OF PILOT TEST OBJECTIVES

The objectives identified in the pilot test work plan (Parsons, 2008) were established to evaluate the effectiveness of enhanced bioremediation for treating chlorinated VOCs in bedrock. Each objective is listed below with a statement regarding the pilot test results in relation to the objective:

- Determine if the rate of *in situ* anaerobic biodegradation can be increased. *Observations from the pilot test suggest that the rate of degradation was increased by the substrate addition and by bioaugmentation.*
- Amend current geochemical conditions to enhance anaerobic dechlorination. *Geochemical conditions were optimized for anaerobic dechlorination.*
- Refine injection methodology and estimate a radius of influence of injection. *Substrate breakthrough was monitored during the injection. The radius of influence and methodology were refined.*
- Assess the impacts of the injection of substrates and microorganisms on hydrogeology (i.e., hydraulic conductivity). *There were no observed changes in hydrogeology, nor were there any cases where well fouling appeared to occur.*
- Assess the potential for solubilization of inorganics (i.e., arsenic), generation of biogenic gases (i.e., methane or hydrogen sulfide), and other undesirable effects (i.e., pH excursion). *Generation of methane and hydrogen sulfide increased in the pilot test area, but the increase at downgradient locations was minimal. Concentrations of arsenic and ferrous iron remained stable or decreased throughout the test. Concentrations of manganese were stable, with the exception of slight increases to approximately 0.5 mg/L at PMW-5 and INJ-04.*
- Determine optimal design parameters for potential full-scale application of enhanced in situ anaerobic bioremediation of chlorinated COCs at the Site. *Key*

findings (hydraulic conductivity, porosity, pH excursions, radius of influence, and vegetable oil loading rates) of the pilot test can be incorporated in a full-scale application at the Site.



NOTE: CORE IS APPROXIMATELY 2.5 INCHES IN DIAMETER

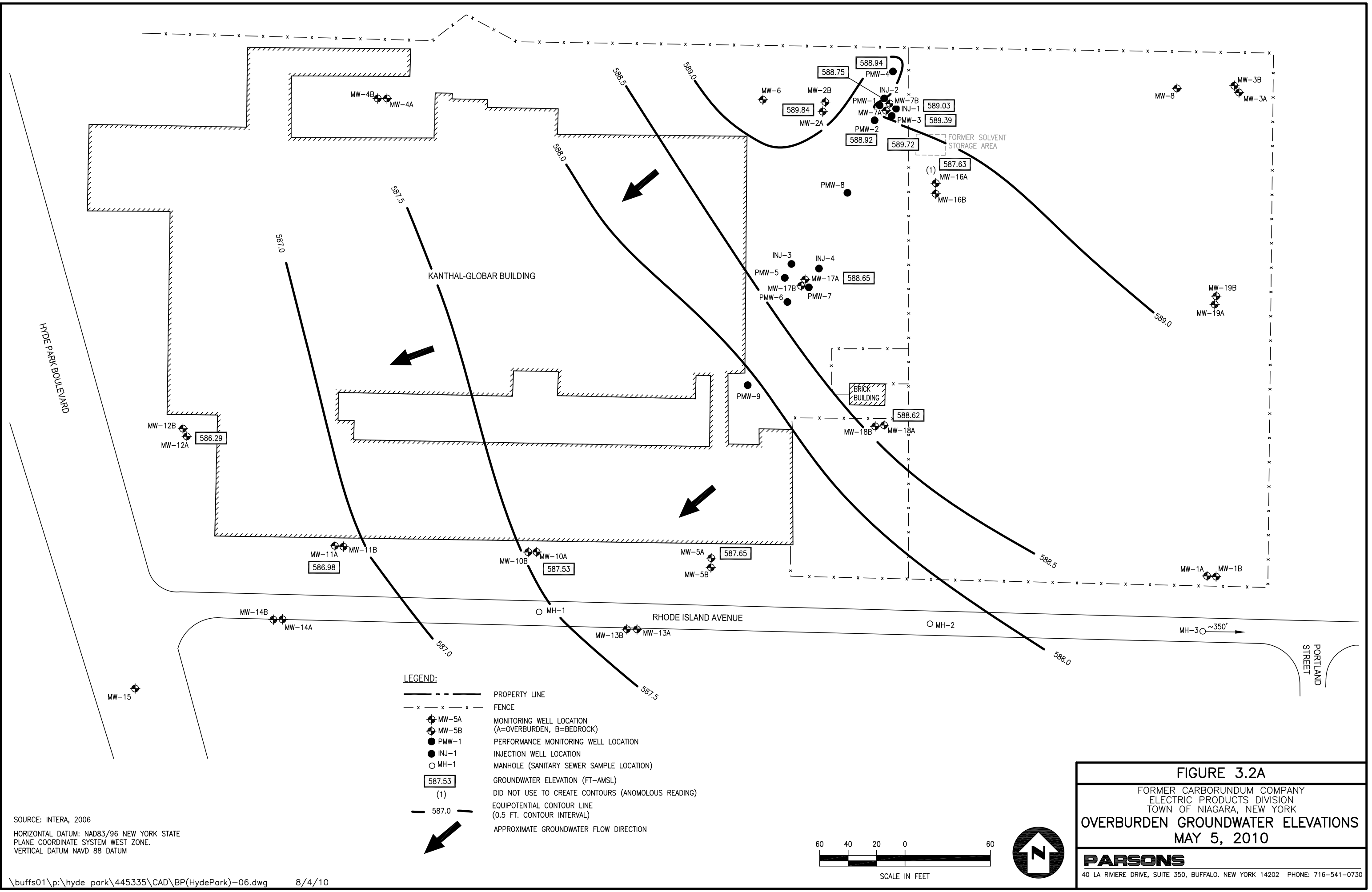
FIGURE 3.1

HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK

PHOTOGRAPH OF TYPICAL ROCK CORE

PARSONS

40 La Riviere Drive, Suite 350, Buffalo, New York 14202



- LEGEND:**
- — — — — PROPERTY LINE
 - x - x - x - x - FENCE
 - ⊕ MW-5A MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
 - ⊕ MW-5B MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
 - PMW-1 PERFORMANCE MONITORING WELL LOCATION
 - INJ-1 INJECTION WELL LOCATION
 - MH-1 MANHOLE (SANITARY SEWER SAMPLE LOCATION)
 - 587.53 GROUNDWATER ELEVATION (FT-AMSL)
 - (1) DID NOT USE TO CREATE CONTOURS (ANOMOLOUS READING)
 - 587.0 — EQUIPOTENTIAL CONTOUR LINE (0.5 FT. CONTOUR INTERVAL)
 - ➔ APPROXIMATE GROUNDWATER FLOW DIRECTION

SOURCE: INTERA, 2006
 HORIZONTAL DATUM: NAD83/96 NEW YORK STATE
 PLANE COORDINATE SYSTEM WEST ZONE.
 VERTICAL DATUM NAVD 88 DATUM

FIGURE 3.2A
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NEW YORK
OVERBURDEN GROUNDWATER ELEVATIONS
 MAY 5, 2010

PARSONS
 40 LA RIVIERE DRIVE, SUITE 350, BUFFALO, NEW YORK 14202 PHONE: 716-541-0730

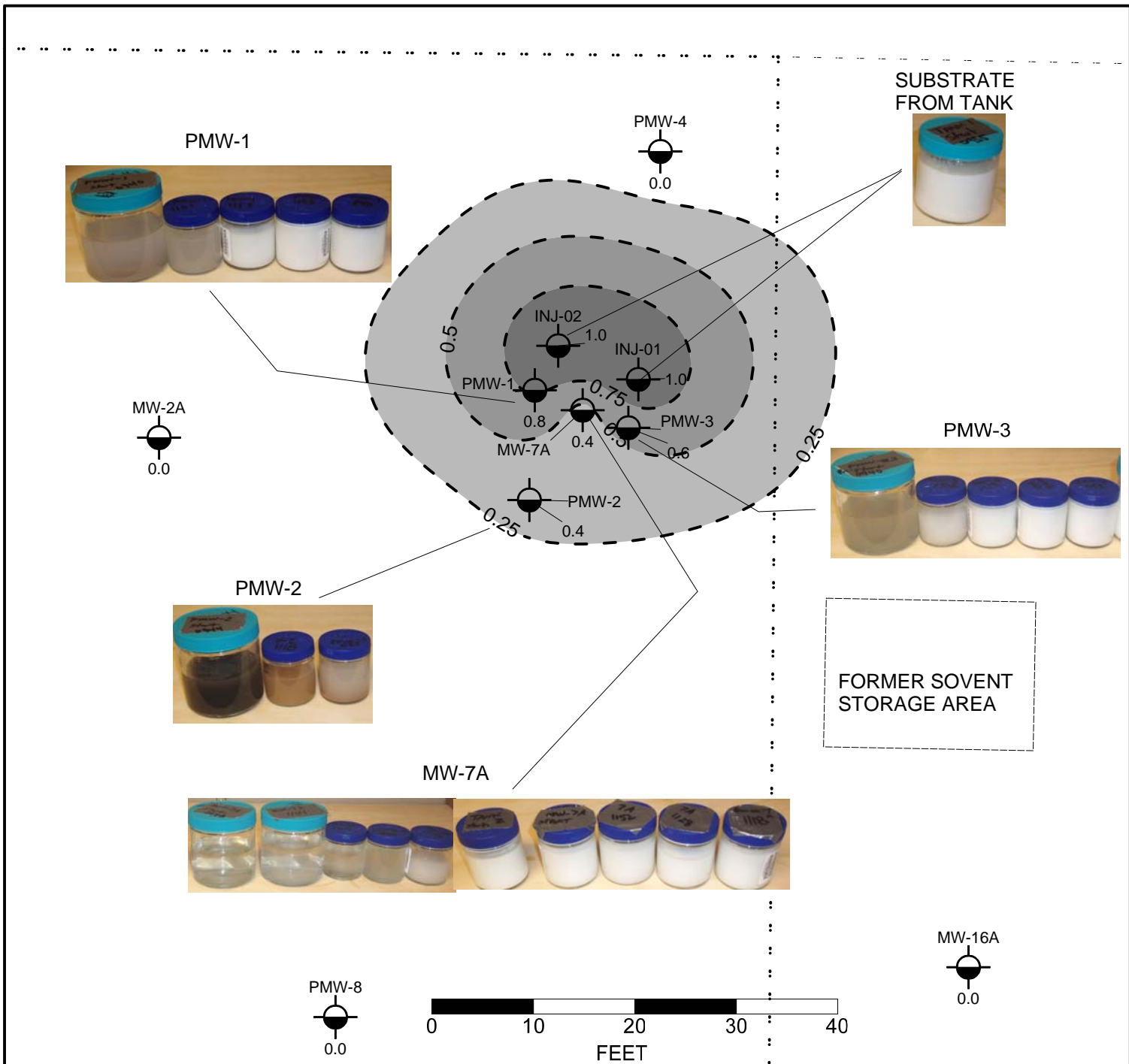


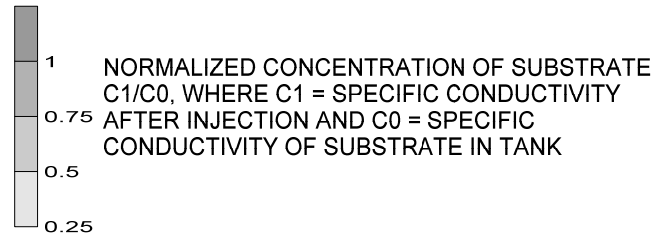
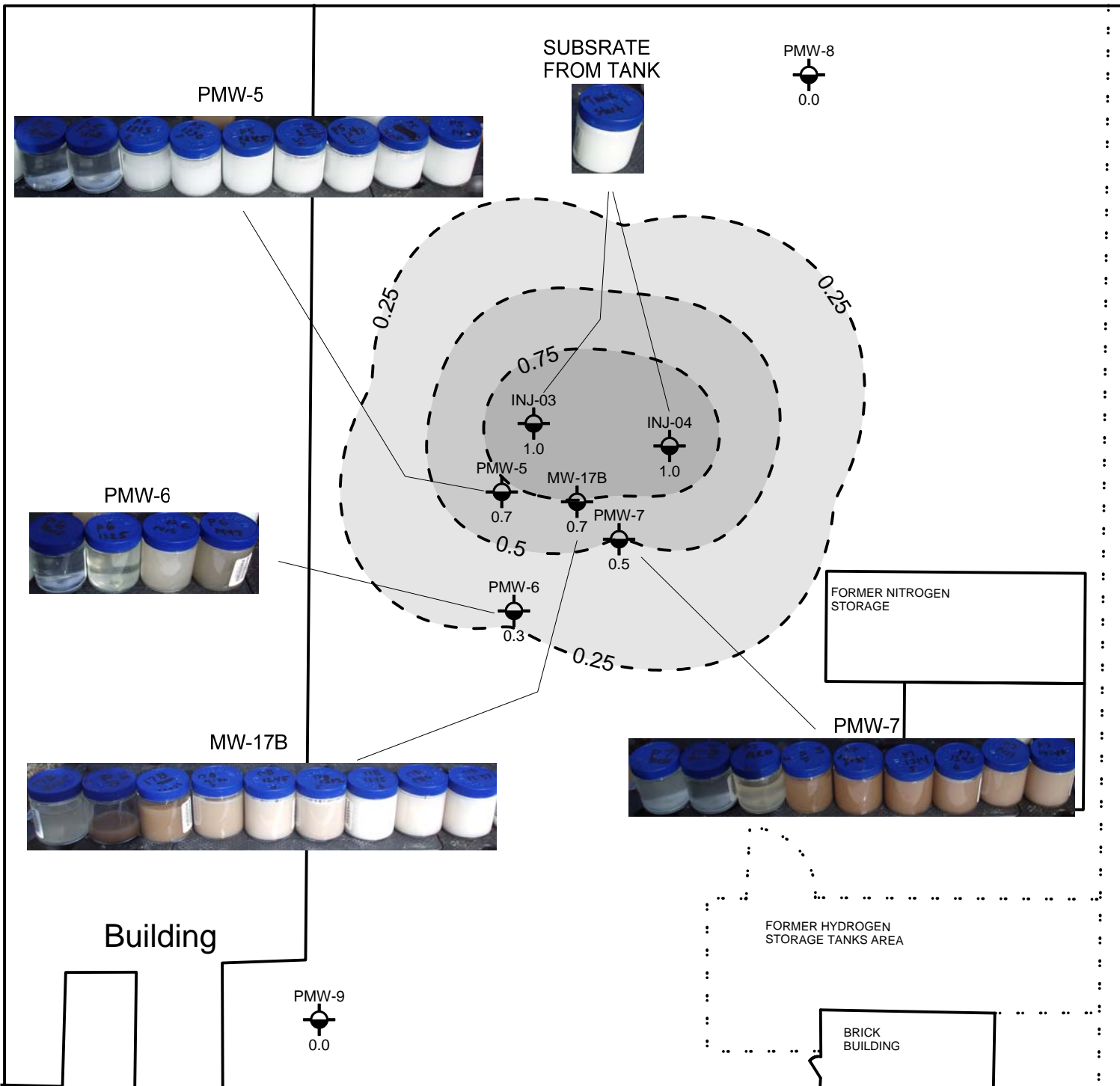
FIGURE 3.3A

FORMER CARBORUNDUM CO.
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NEW YORK

SUBSTRATE DISTRIBUTION MAP
FALL 2009 OVERBURDEN INJECTIONS

PARSONS

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1 NORMALIZED CONCENTRATION OF SUBSTRATE C_1/C_0 , WHERE C_1 = SPECIFIC CONDUCTIVITY AFTER INJECTION AND C_0 = SPECIFIC CONDUCTIVITY OF SUBSTRATE IN TANK

PHOTOGRAPH OF SAMPLES TAKEN DURING INJECTION 1



WELL WITH NORMALIZED SPECIFIC CONDUCTIVITY ($\mu\text{S}/\text{CM}$)

FIGURE 3.3B

FORMER CARBORUNDUM CO.
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NEW YORK

SUBSTRATE DISTRIBUTION MAP
BEDROCK INJECTIONS

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FIGURE 3.4A - CONCENTRATIONS OF CHLOROETHENES AT WELL INJ-02

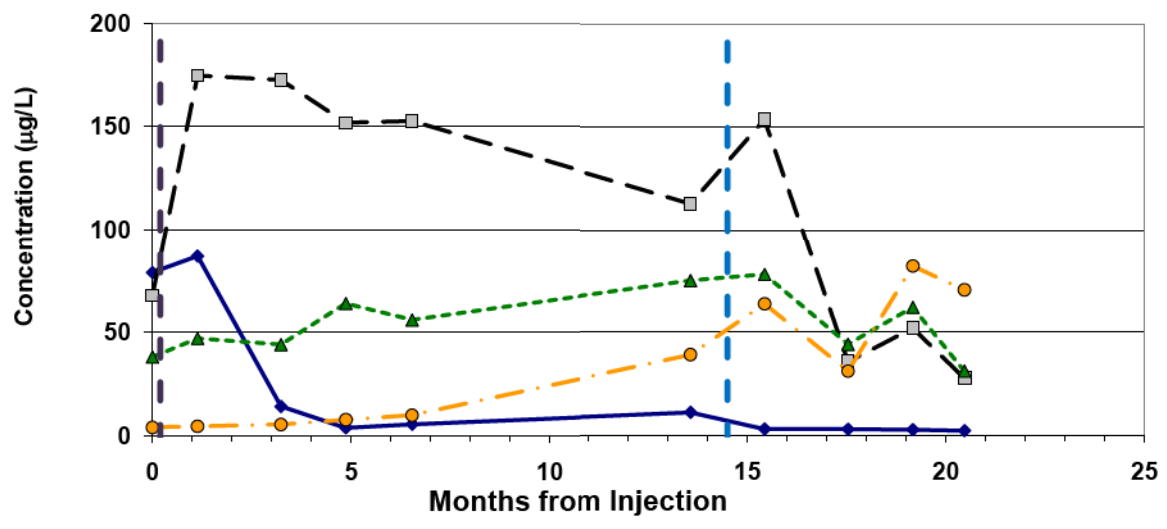
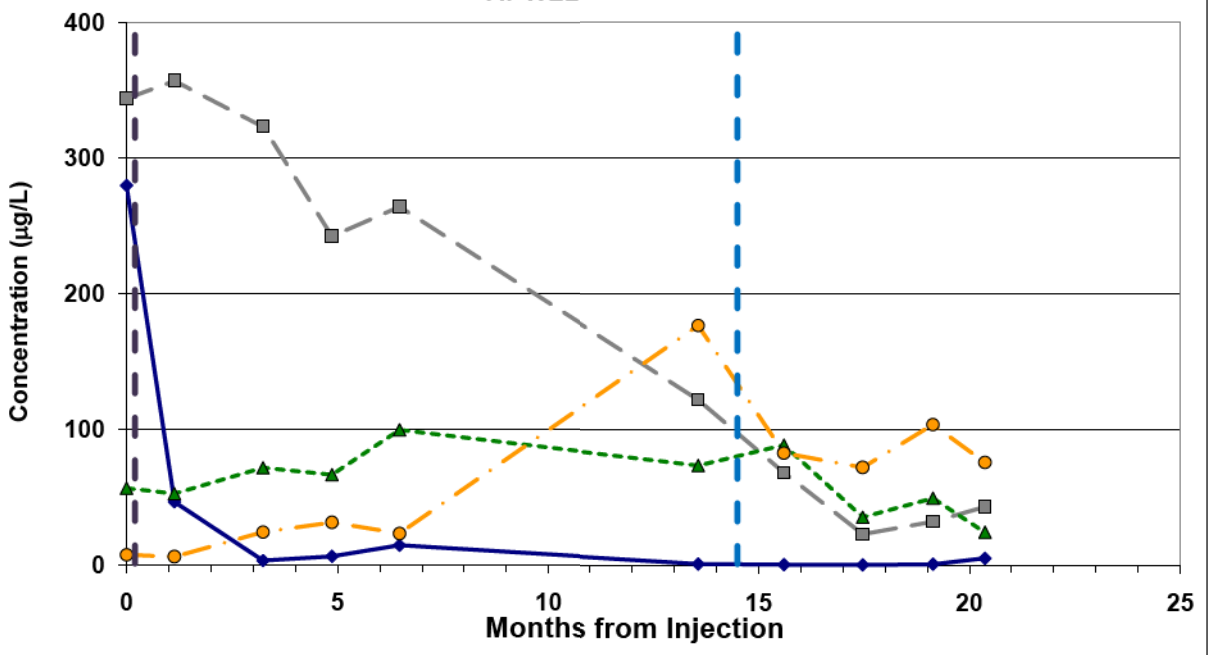


FIGURE 3.4A - CONCENTRATIONS OF CHLOROETHENES AT WELL PMW-1



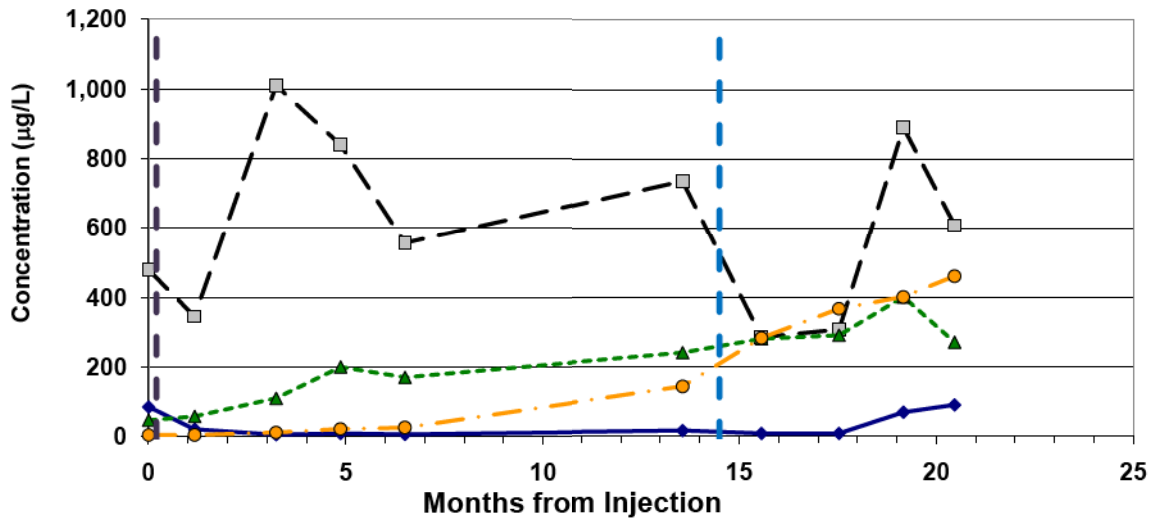
- ◆ TCE
- Total DCE
- ▲ VC
- Ethene + Ethane
- Injection 1 (Fall 08)
- Injection 2 (Fall 09)

FIGURE 3.4A
 FORMER CARBORUNDUM COMPANY
 TOWN OF NIAGARA, NY
 PILOT TEST

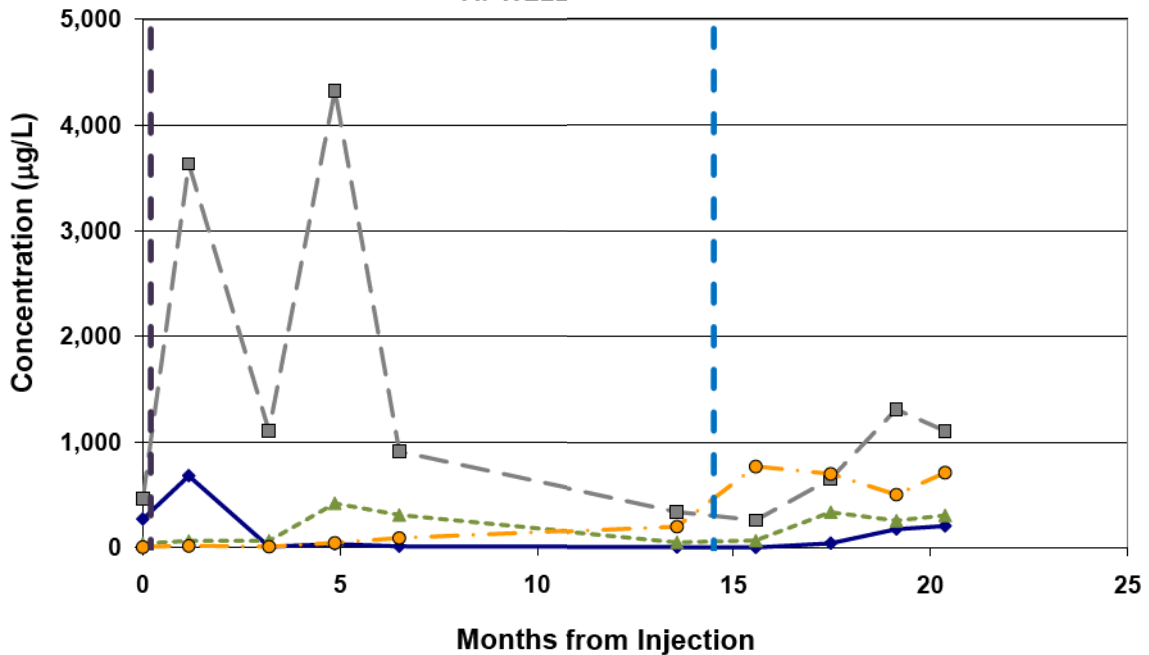
TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

PARSONS
 40 La Riviere Dr., Suite 350, Buffalo NY 14222

**FIGURE 3.4A - CONCENTRATIONS OF CHLOROETHENES
AT WELL INJ-01**



**FIGURE 3.4A - CONCENTRATIONS OF CHLOROETHENES
AT WELL PMW-3**



- ◆ TCE
- Total DCE
- ▲ VC
- Ethene + Ethane
- Injection 1 (Fall 08)
- Injection 2 (Fall 09)

FIGURE 3.4A

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY
PILOT TEST

TRENDS OF CHLORINATED ETHENES IN SELECTED
WELLS (OVERBURDEN)

PARSONS

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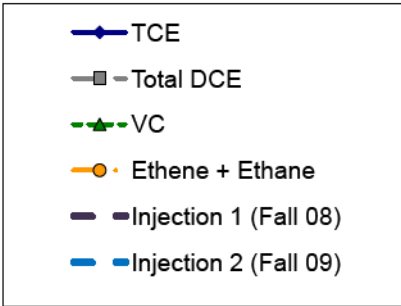
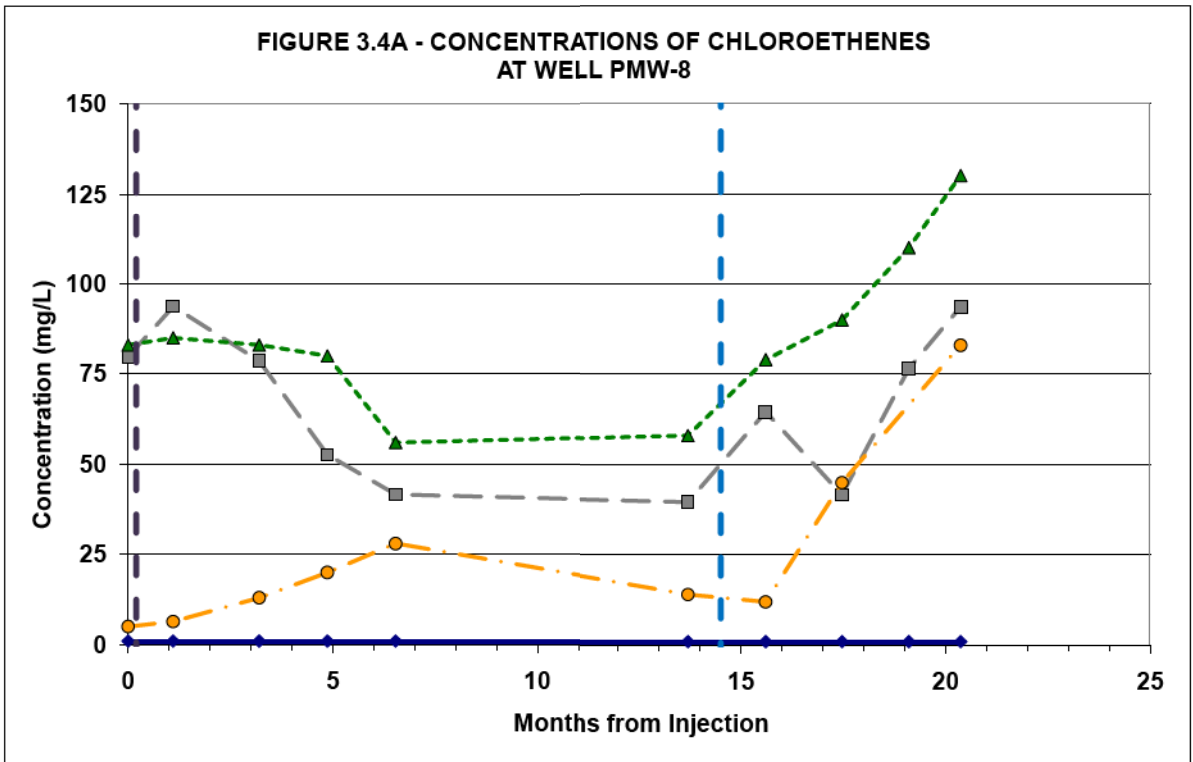
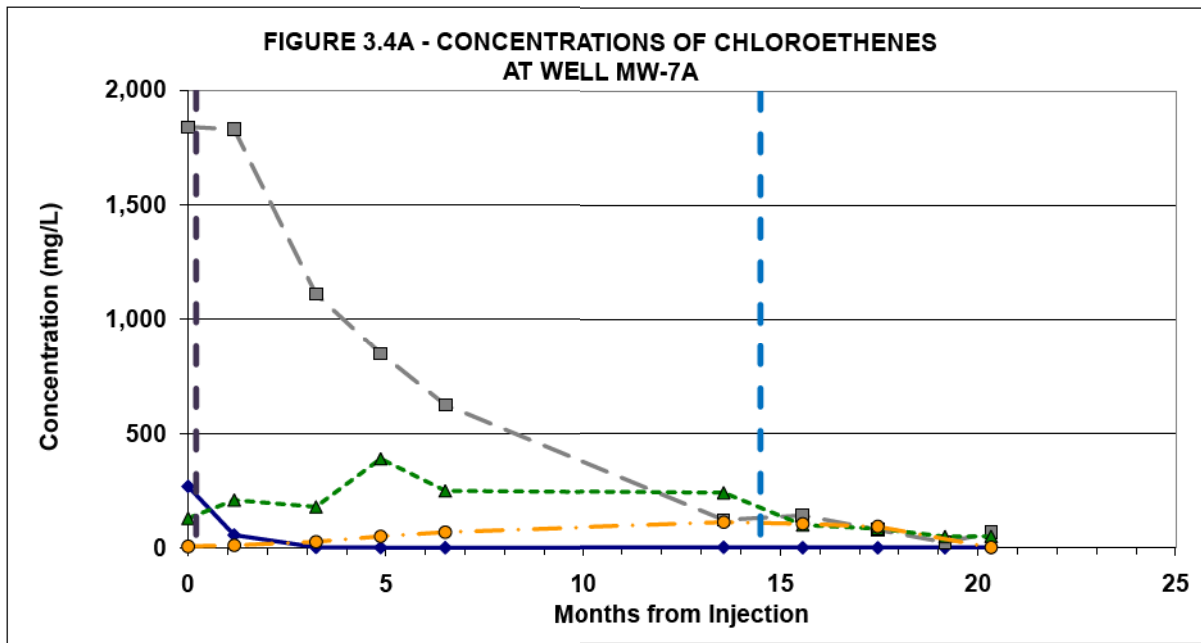


FIGURE 3.4A
FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY
PILOT TEST

**TRENDS OF CHLORINATED ETHENES IN SELECTED
WELLS (OVERBURDEN)**

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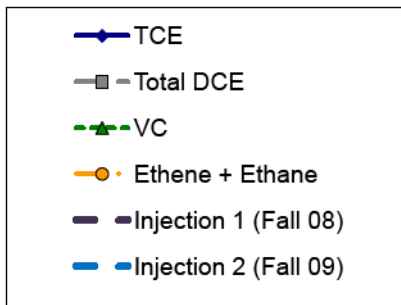
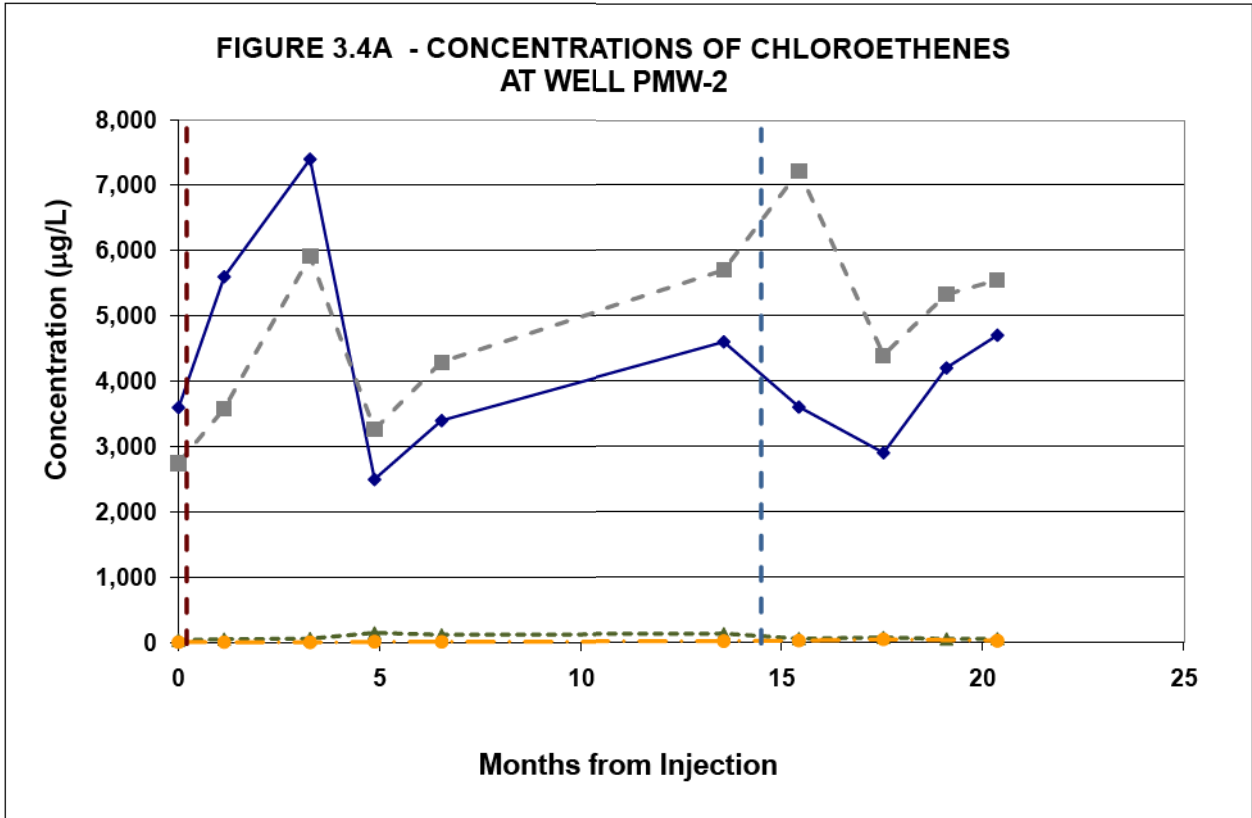


FIGURE 3.4A
 FORMER CARBORUNDUM COMPANY
 TOWN OF NIAGARA, NY
 PILOT TEST

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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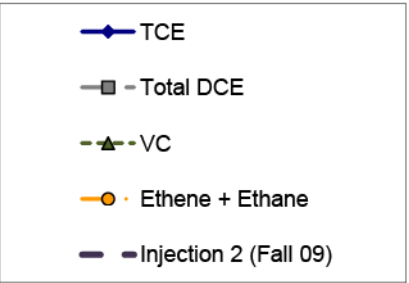
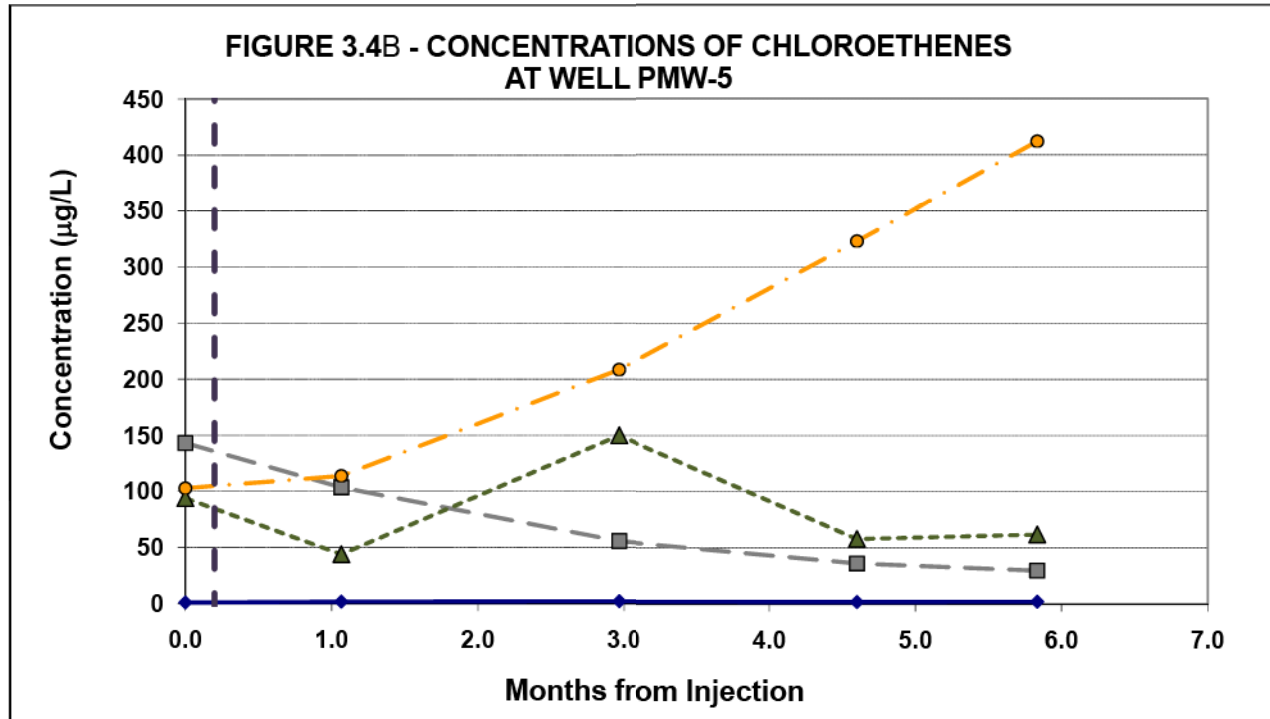
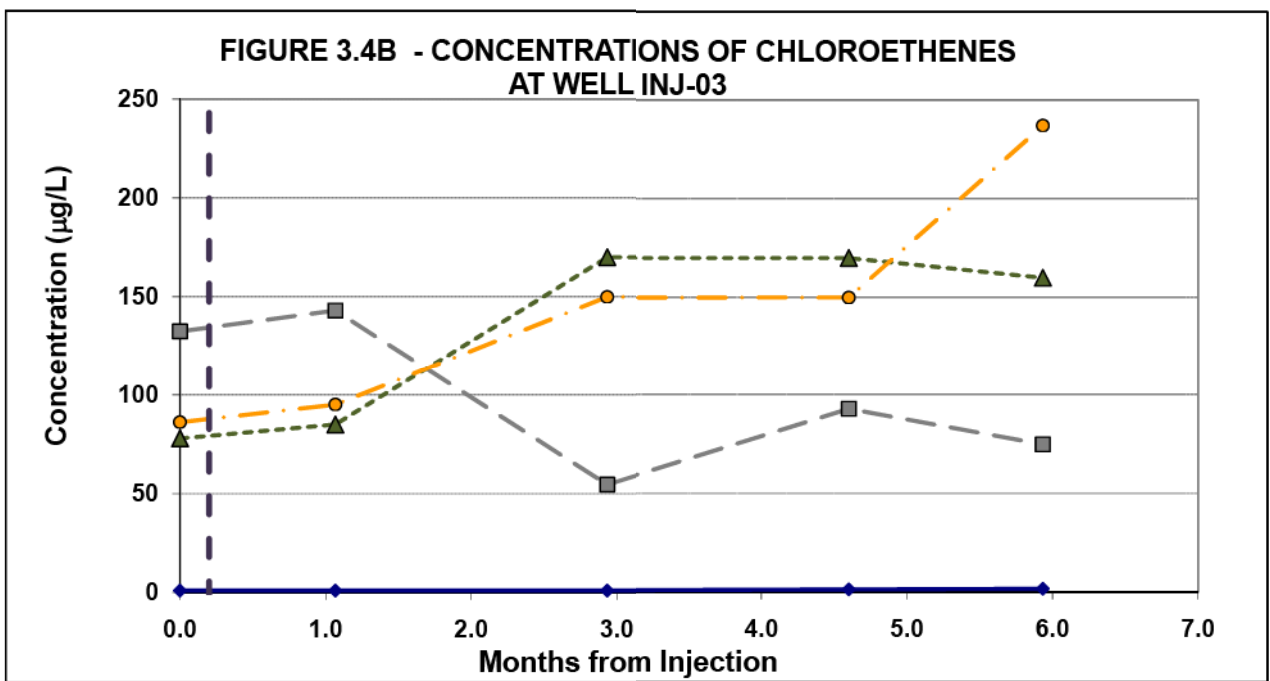


FIGURE 3.4B
 FORMER CARBORUNDUM COMPANY
 TOWN OF NIAGARA, NY
 PILOT TEST

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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FIGURE 3.4B - CONCENTRATIONS OF CHLOROETHENES AT WELL INJ-04

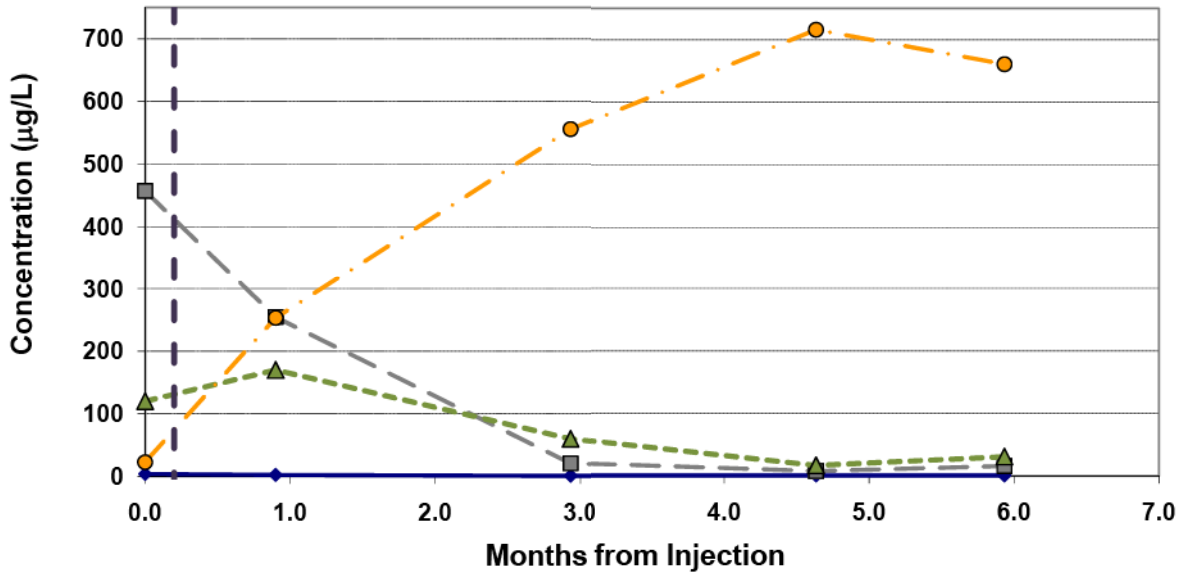


FIGURE 3.4B - CONCENTRATIONS OF CHLOROETHENES AT WELL PMW-7

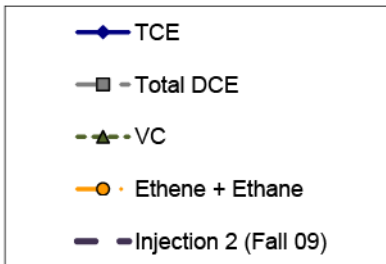
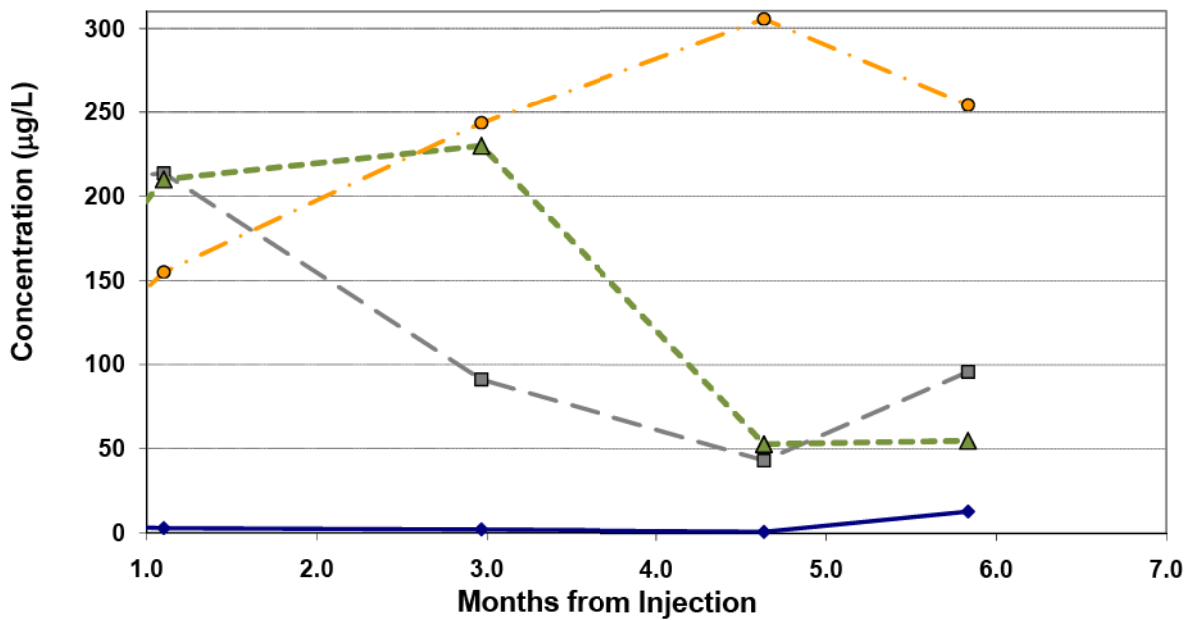


FIGURE 3.4B

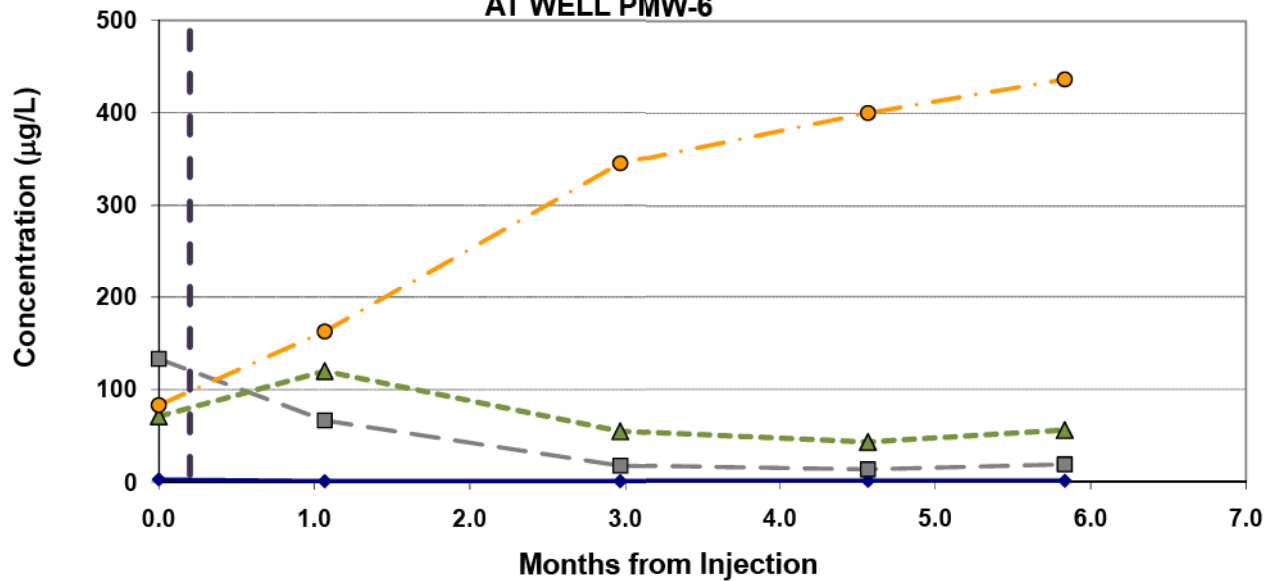
FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY
PILOT TEST

TRENDS OF CHLORINATED ETHENES IN SELECTED
WELLS (BEDROCK)

PARSONS

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**FIGURE 3.4B - CONCENTRATIONS OF CHLOROETHENES
AT WELL PMW-6**



**FIGURE 3.4B - CONCENTRATIONS OF CHLOROETHENES
AT WELL PMW-9**

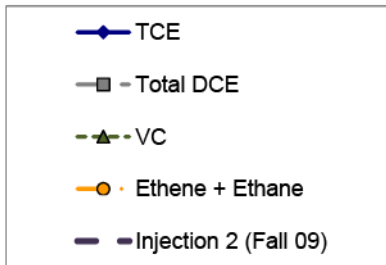
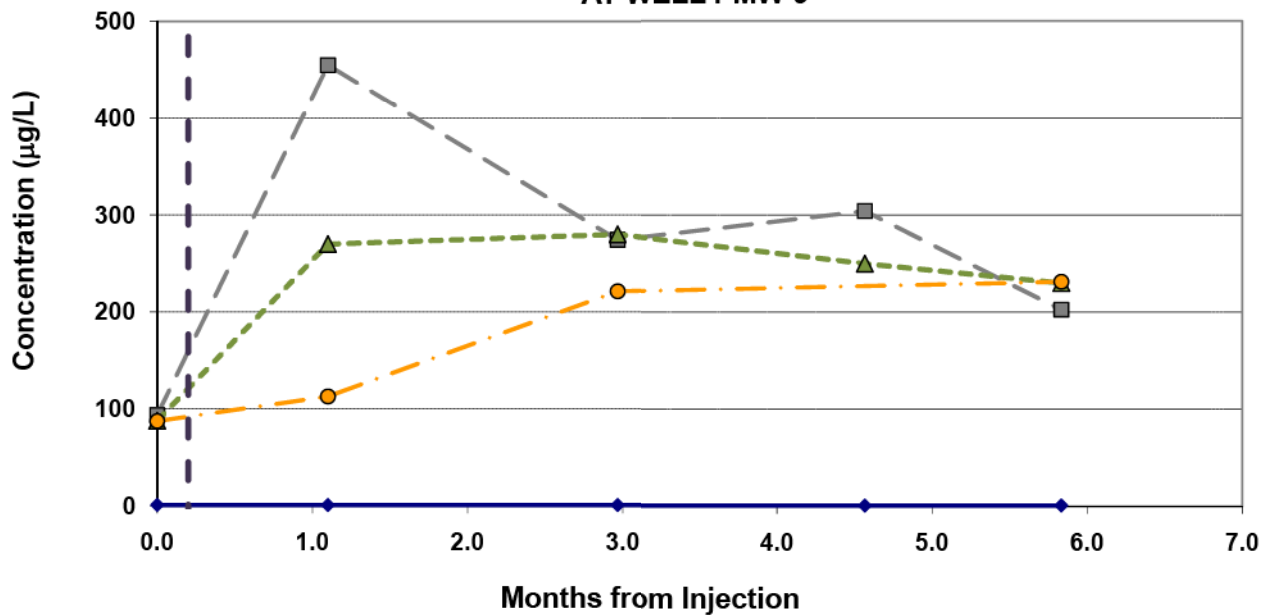


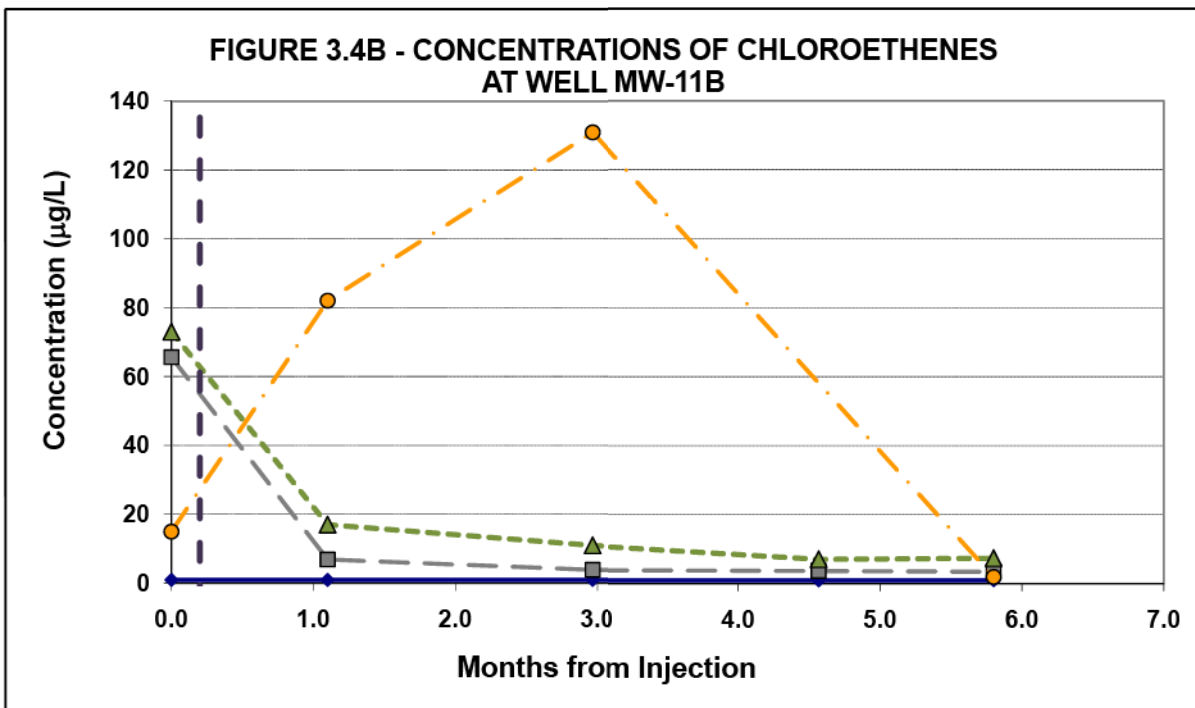
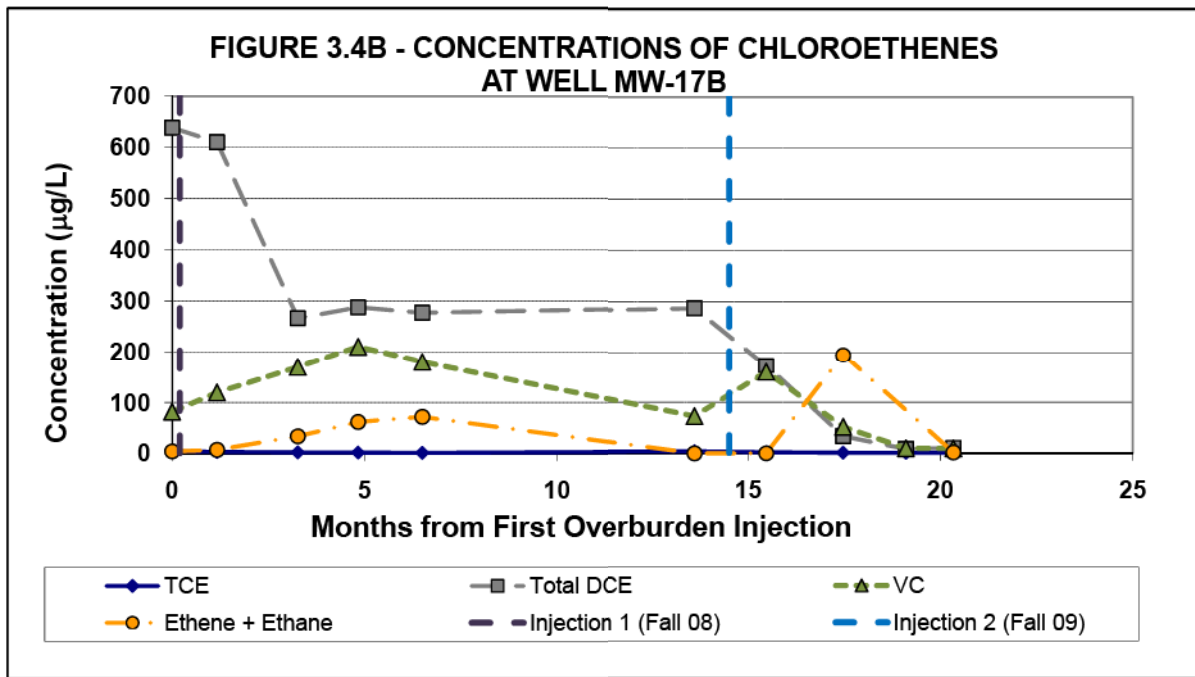
FIGURE 3.4B

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY
PILOT TEST

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS
(BEDROCK)

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Note: Low concentrations of light gases including ethene were anomalous.

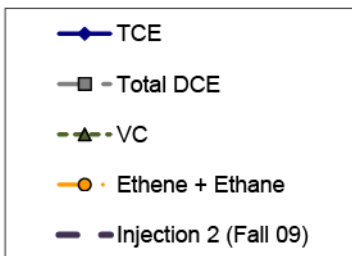
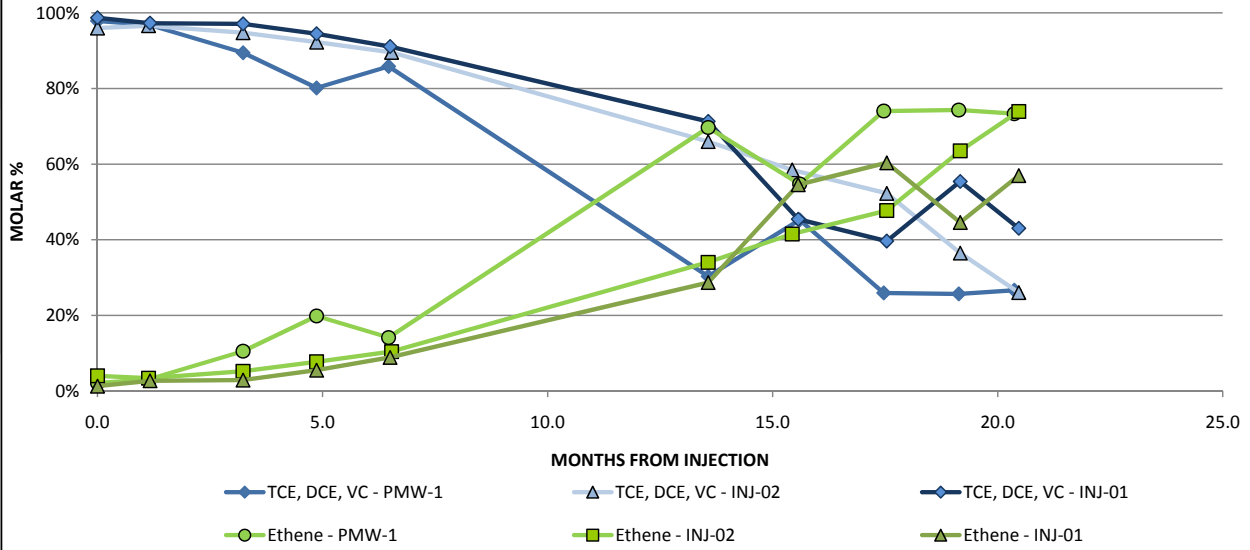


FIGURE 3.4B
 FORMER CARBORUNDUM COMPANY
 TOWN OF NIAGARA, NY
 PILOT TEST

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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OVERBURDEN WELLS



BEDROCK WELLS

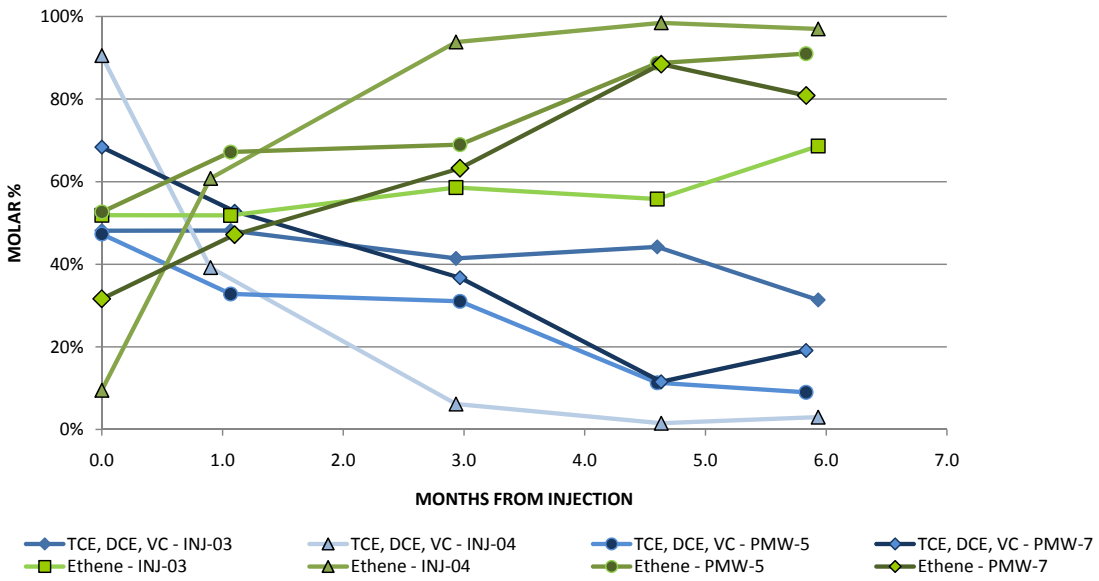


FIGURE 3.5 A&B
 FORMER CARBORUNDUM COMPANY
 MOLAR PERCENT CONCENTRATION OF
 TCE/DCE/VC/ETHENE (OVERBURDEN AND BEDROCK
 WELLS)

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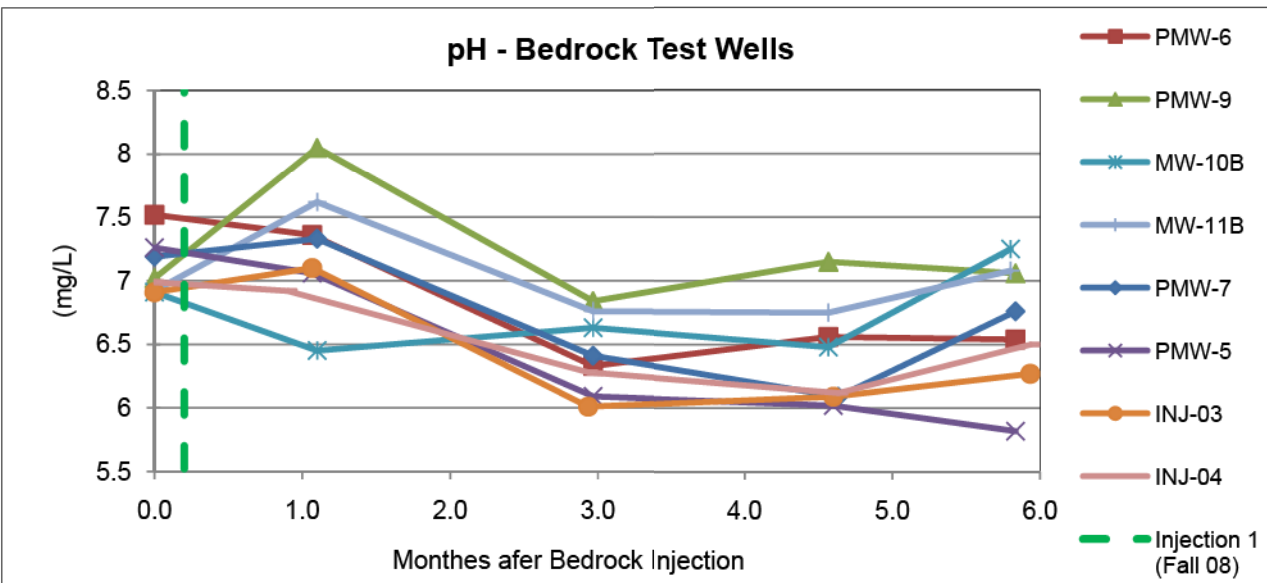
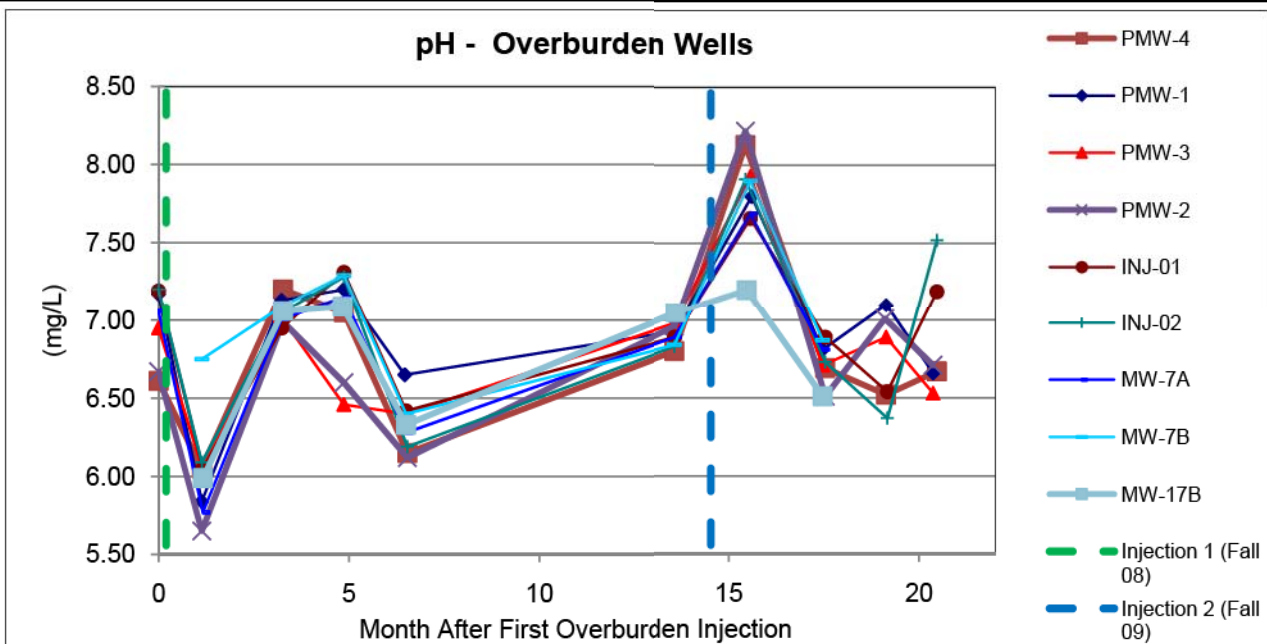


FIGURE 3.6 A
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NY
 PILOT TEST

TRENDS OF GEOCHEMICAL INDICATORS IN
 SELECTED WELLS

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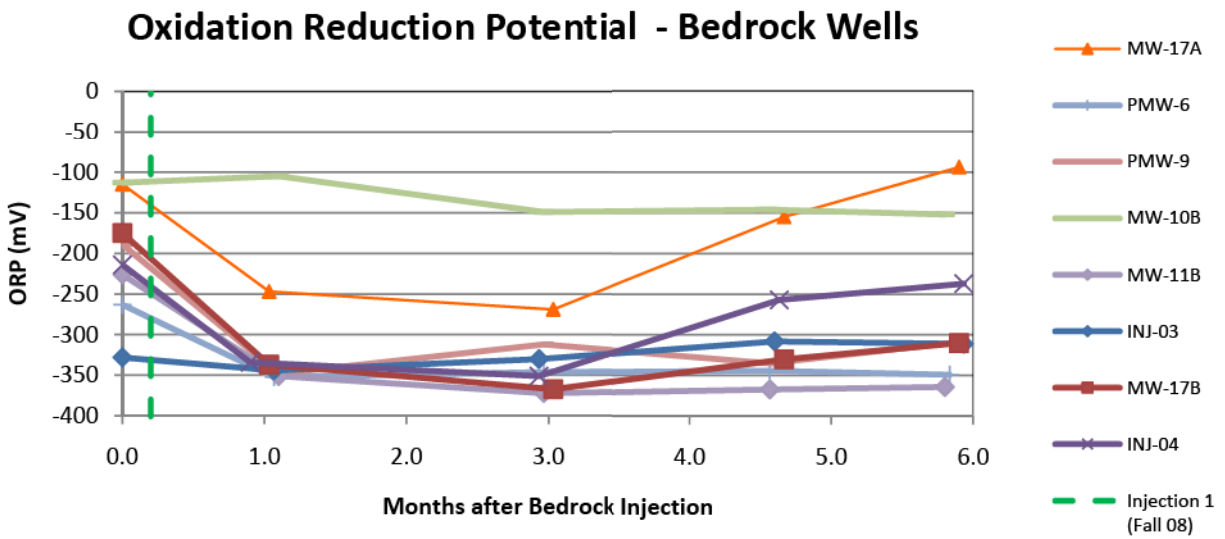
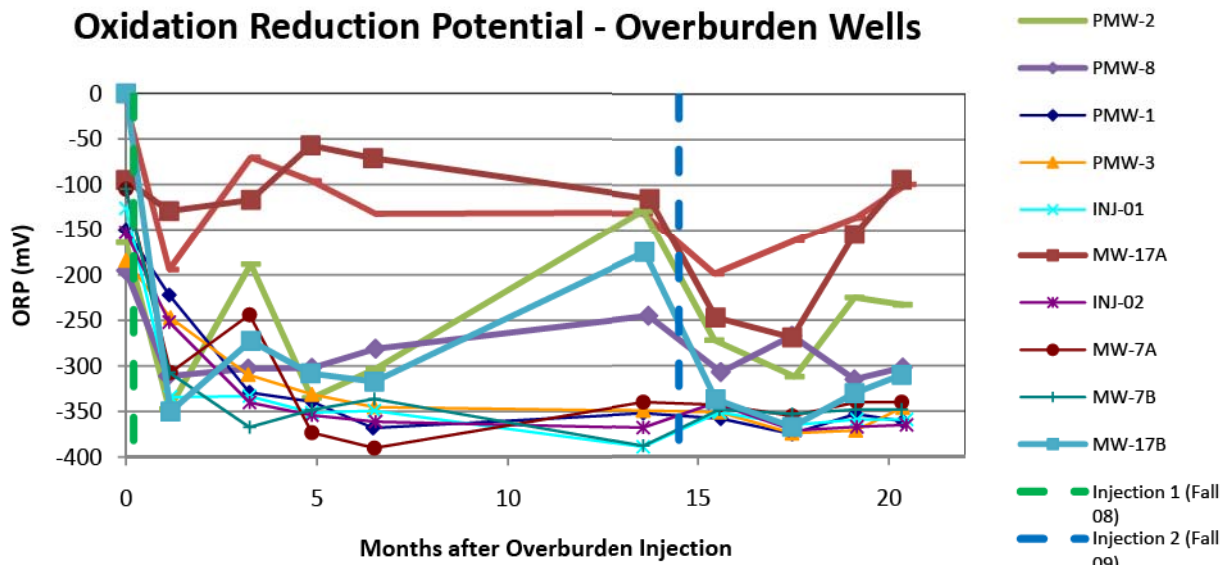


FIGURE 3.6 B
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NY
 PILOT TEST

TRENDS OF GEOCHEMICAL INDICATORS IN
 SELECTED WELLS

PARSONS
 40 La Riviere Dr., Suite 350, Buffalo NY 14222

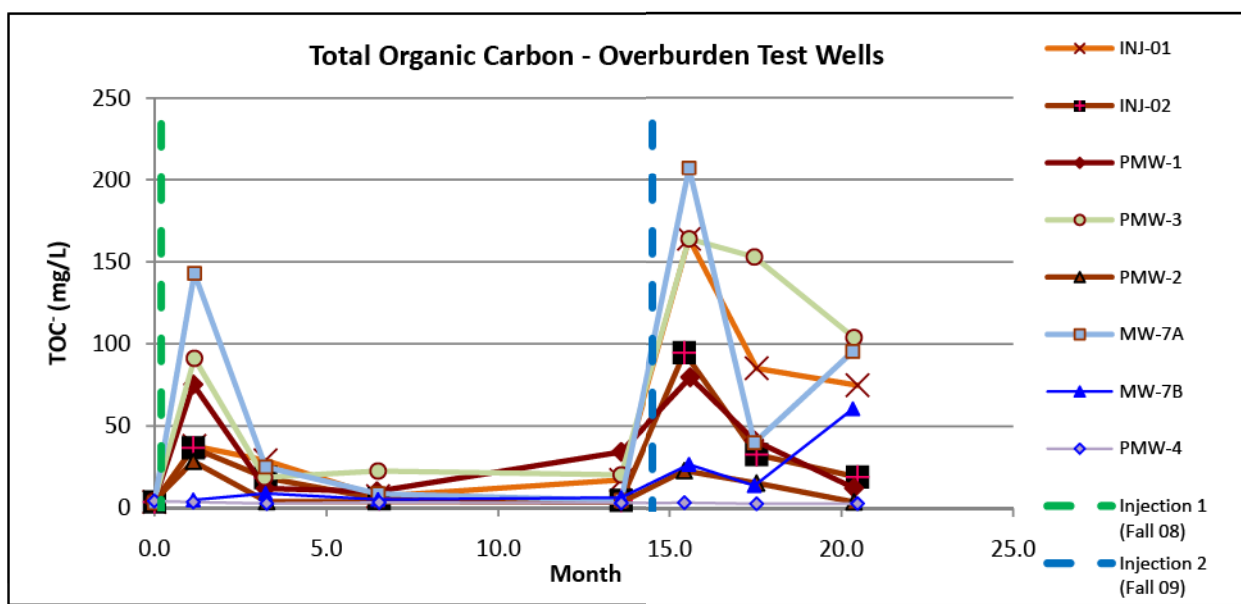
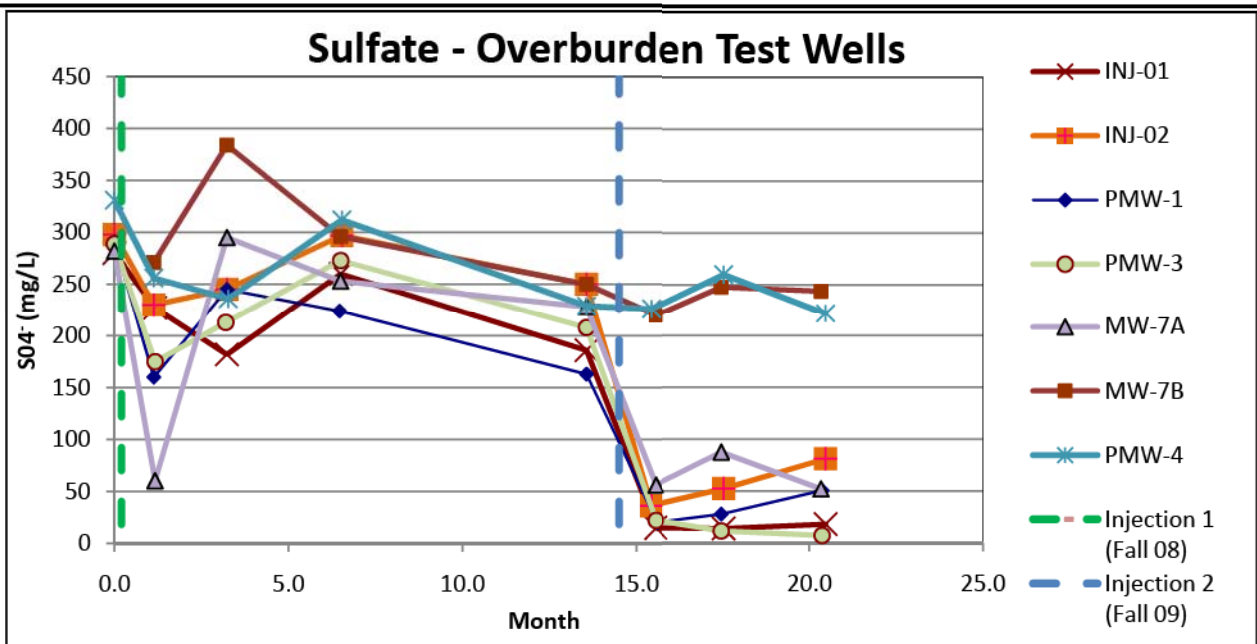


FIGURE 3.6 C
FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY
PILOT TEST

**TRENDS OF GEOCHEMICAL INDICATORS IN
SELECTED WELLS**

PARSONS
40 La Riviere Dr., Suite 350, Buffalo NY 14222

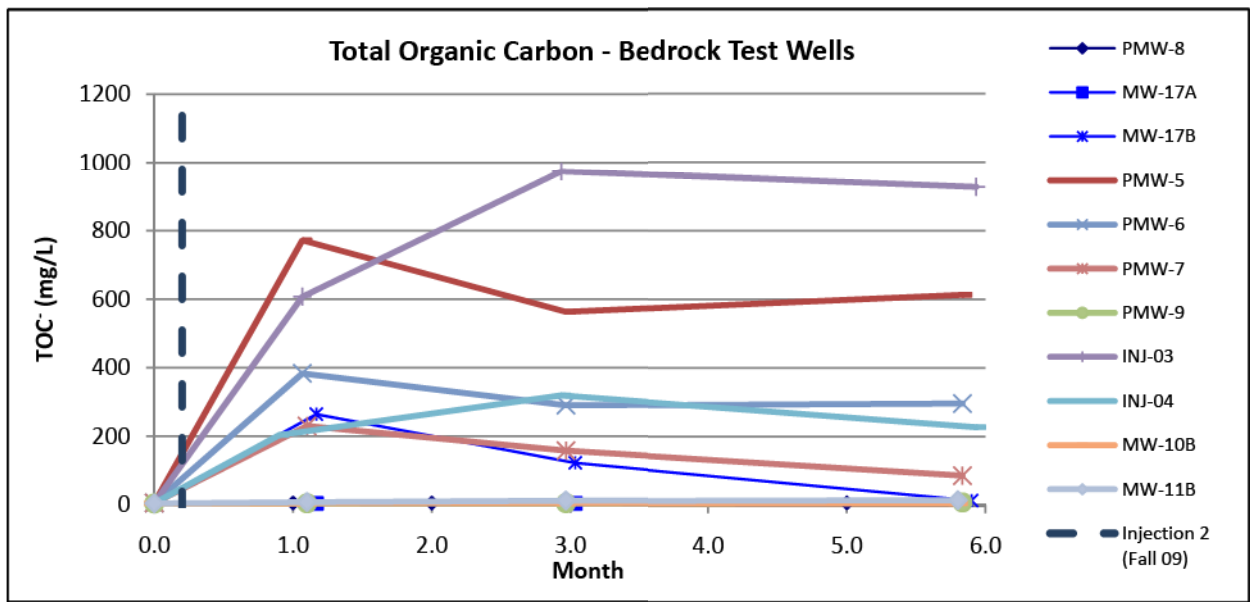
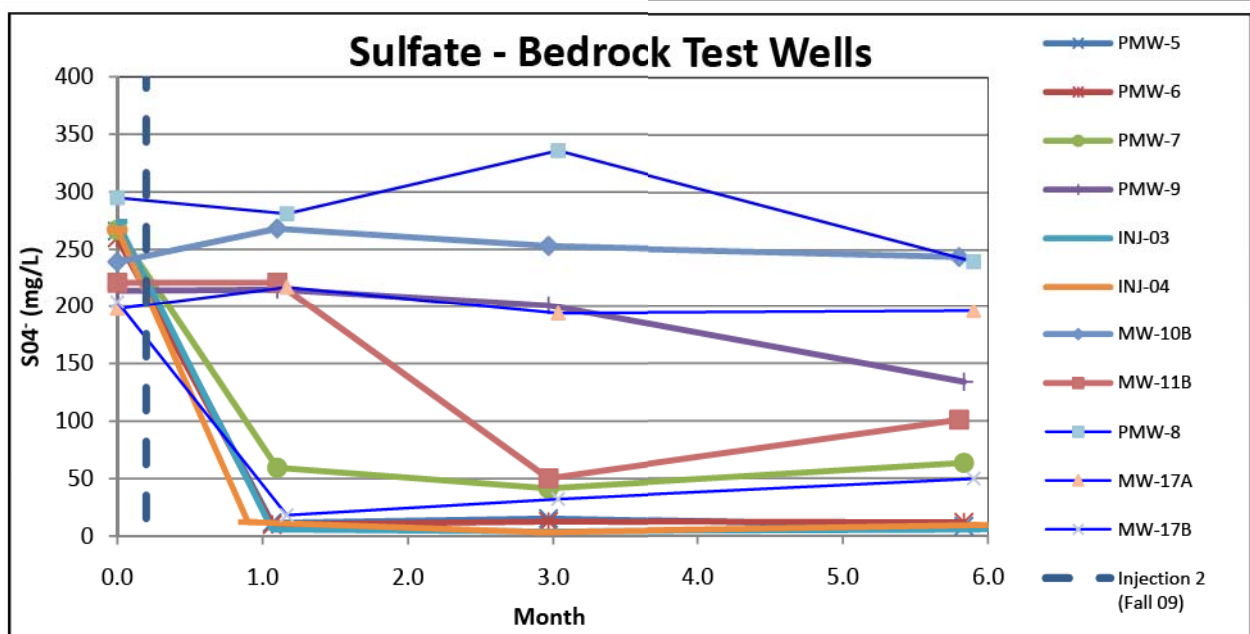
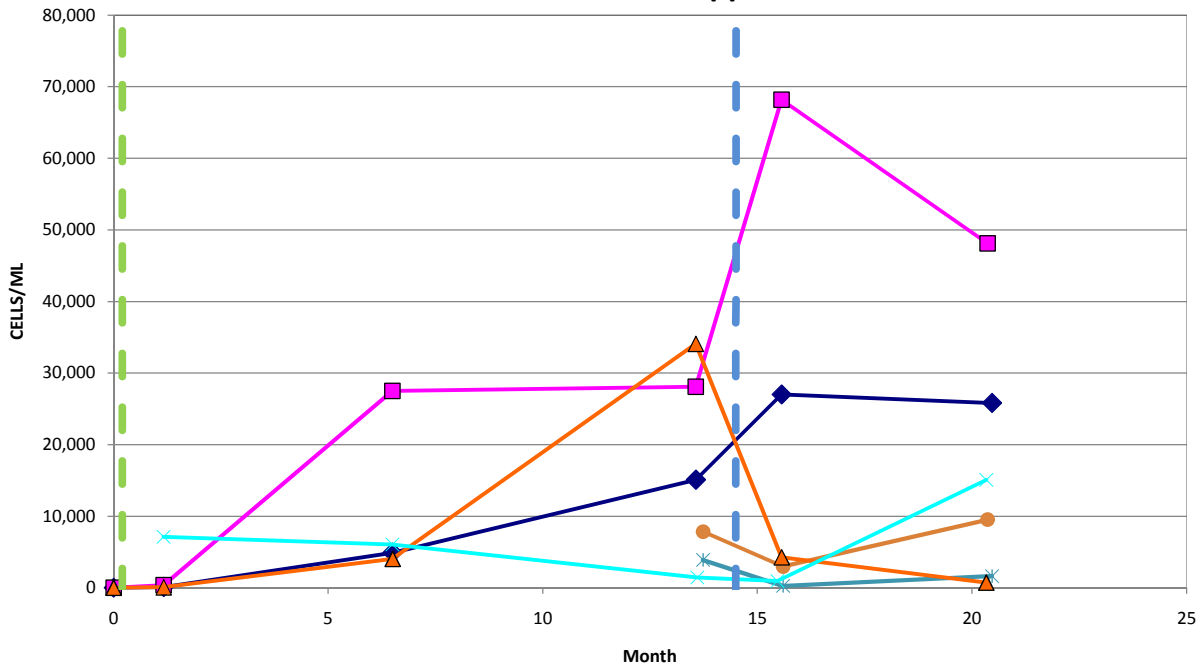


FIGURE 3.6 D
FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY
PILOT TEST

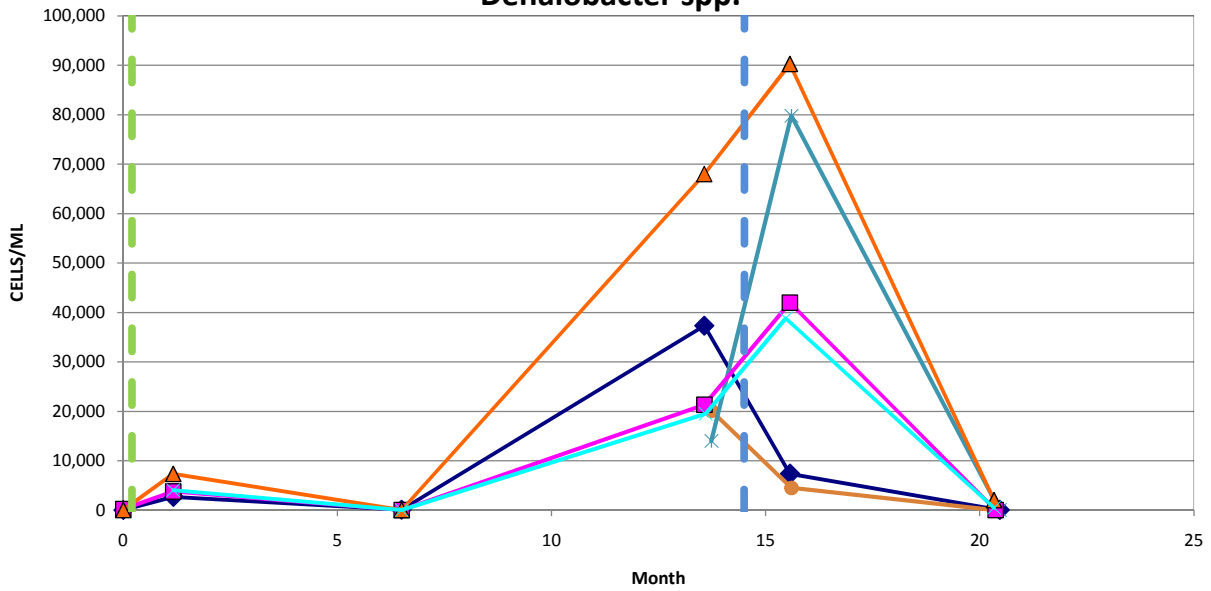
TRENDS OF GEOCHEMICAL INDICATORS
IN SELECTED WELLS

PARSONS
 40 La Riviere Dr., Suite 350, Buffalo NY 14222

Dehalococcoides spp.



Dehalobacter spp.



- ◆ INJ-01
- PMW-5
- * INJ-03
- PMW-3
- ▲ MW-7A
- × MW-17B
- Injection 2 (Fall 09)
- Injection 1 (Fall 08)

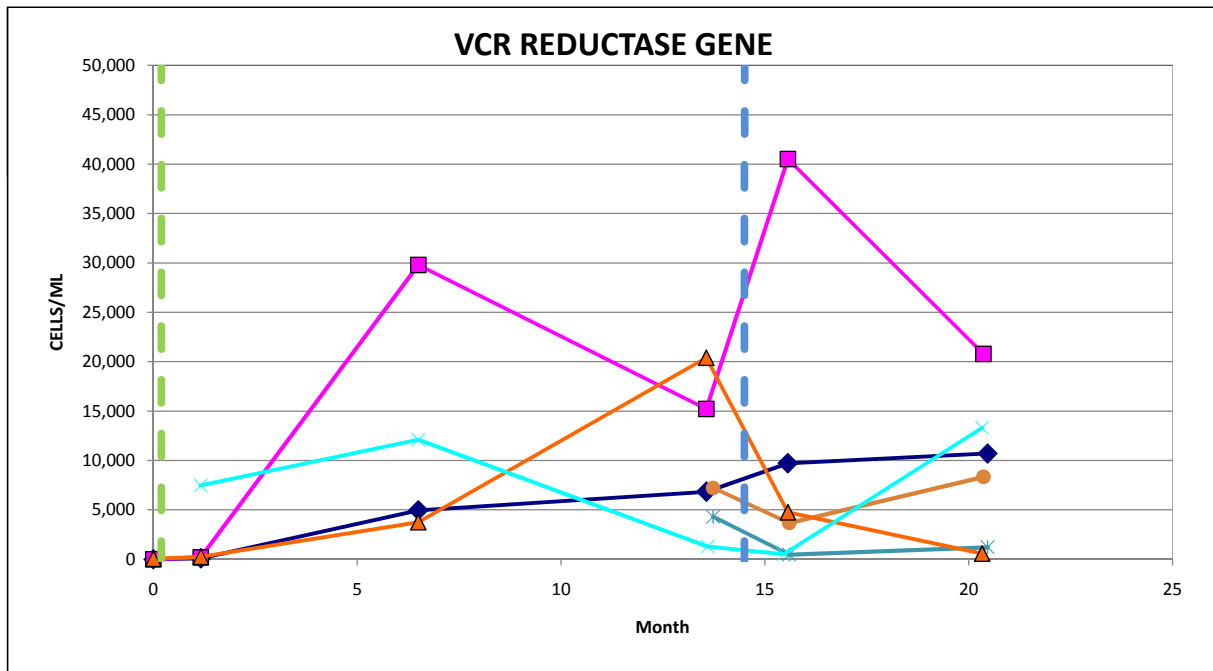
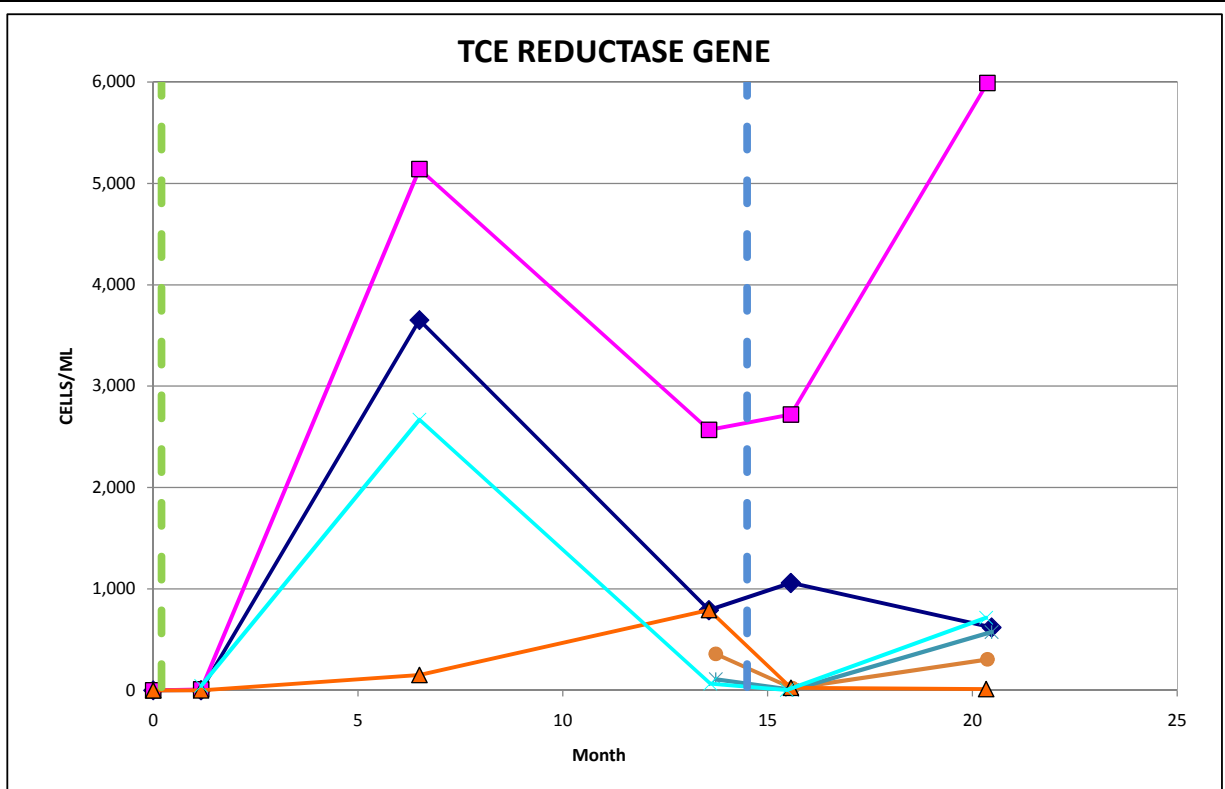
FIGURE 3.7

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY
PILOT TEST

TRENDS OF MICROBIAL POPULATIONS

PARSONS

40 La Riviere Dr., Suite 350, Buffalo NY 14202



- ◆ INJ-01
- PMW-5
- * INJ-03
- PMW-3
- ▲ MW-7A
- ✕ MW-17B
- Injection 2 (Fall 09)
- Injection 1 (Fall 08)

FIGURE 3.7
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NY
 PILOT TEST

TRENDS OF MICROBIAL POPULATIONS

PARSONS
 40 La Riviere Dr., Suite 350, Buffalo NY 14202

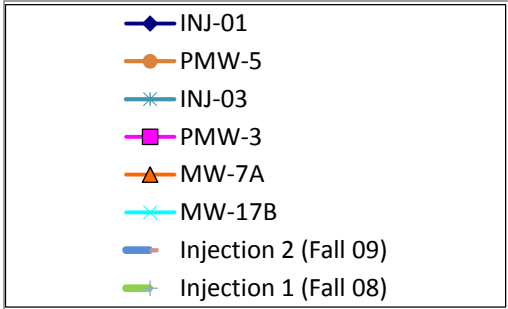
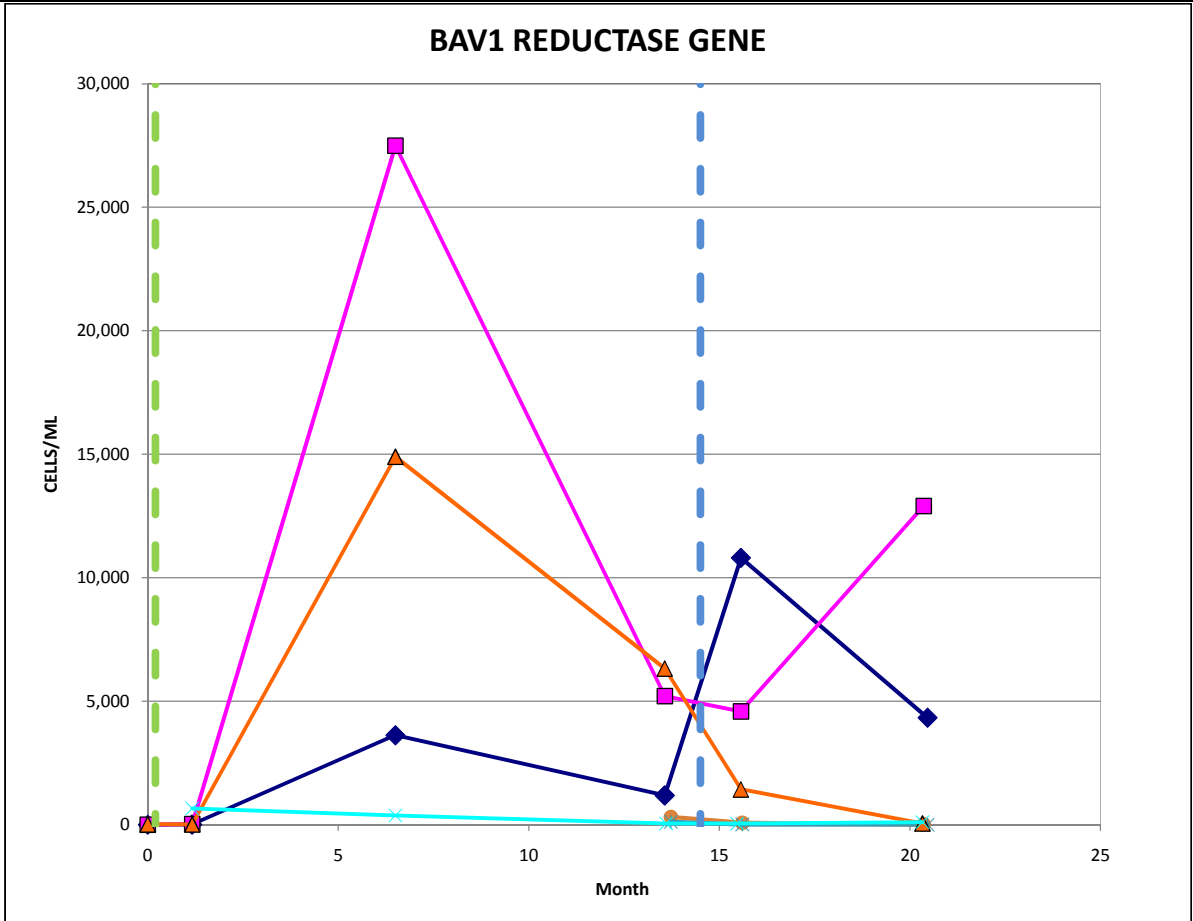


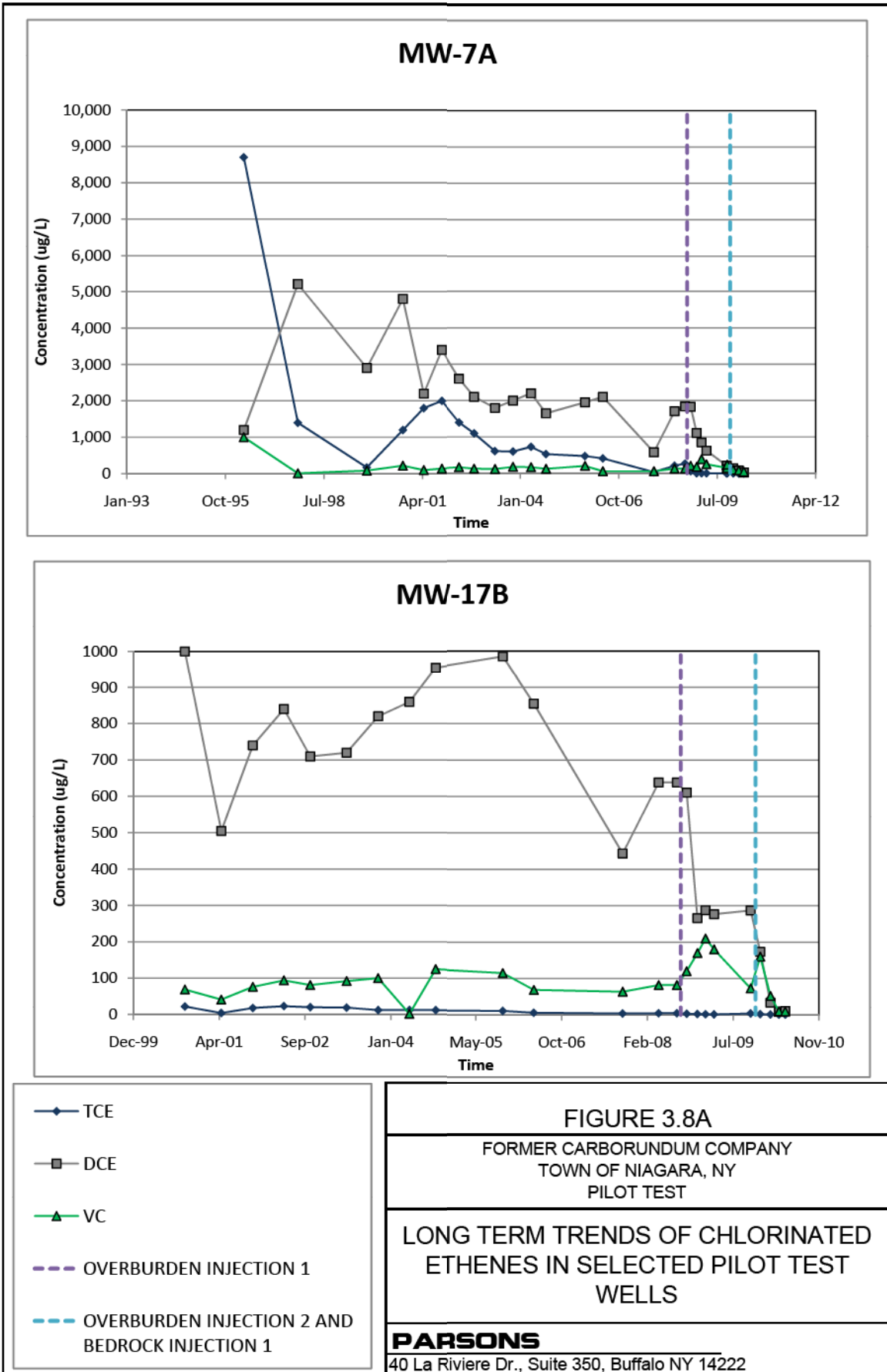
FIGURE 3.7

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY
PILOT TEST

TRENDS OF MICROBIAL POPULATIONS

PARSONS

40 La Riviere Dr., Suite 350, Buffalo NY 14202



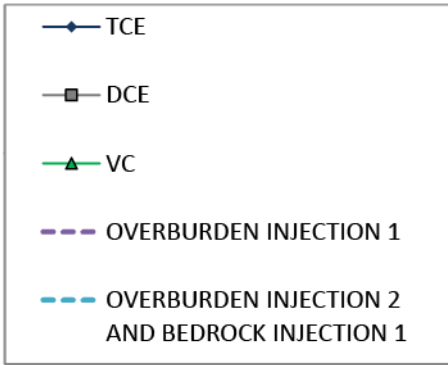
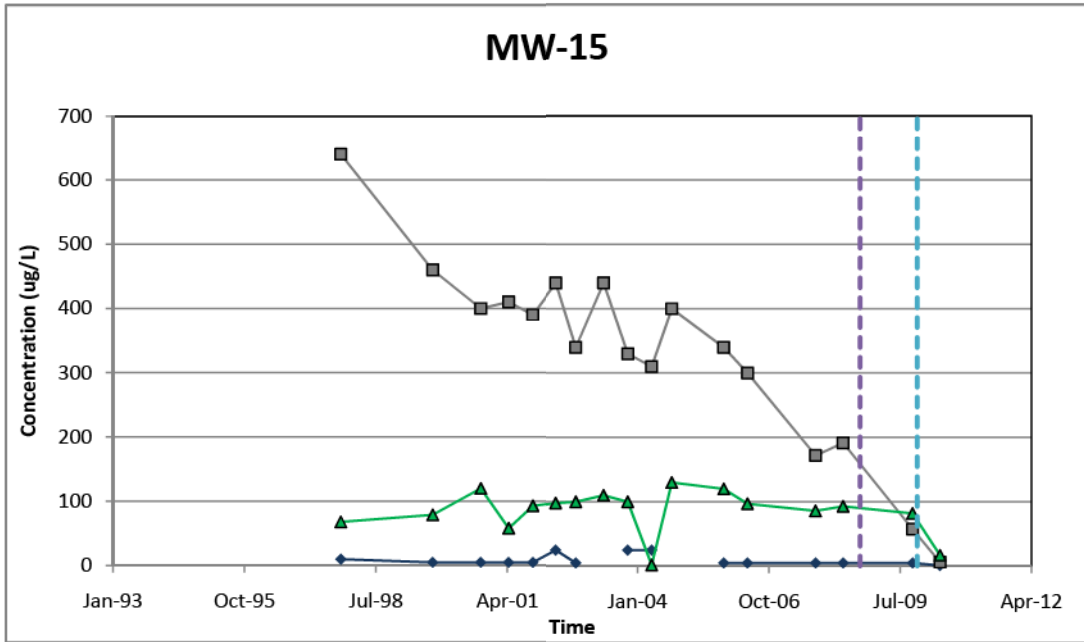
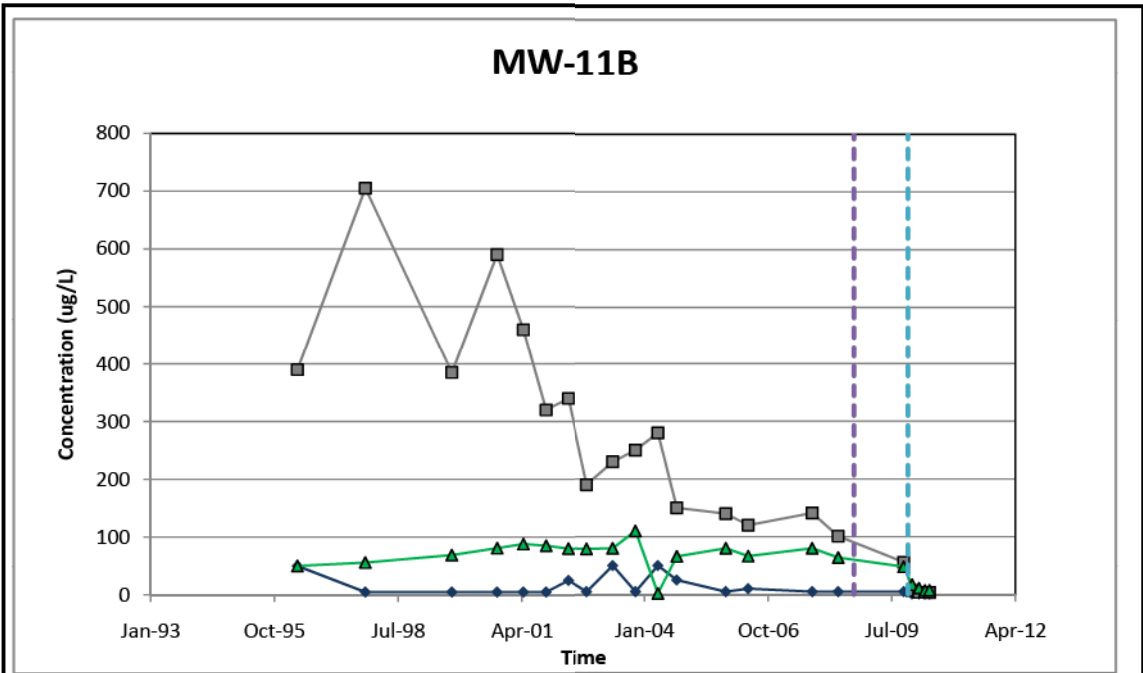


FIGURE 3.8B
 FORMER CARBORUNDUM COMPANY
 TOWN OF NIAGARA, NY
 PILOT TEST

**LONG TERM TRENDS OF CHLORINATED
 ETHENES IN DOWNGRADIENT BEDROCK
 WELLS**

PARSONS
 40 La Riviere Dr., Suite 350, Buffalo NY 14222

TABLE 3.1
WATER LEVEL MEASUREMENTS
(MAY 2010)

Well No.	Elevation TOC	Easting	Northing	5/5/10	
				Water Level	GW Elevation
PMW-1	596.61	1028372.29	1136886.28	6.48	590.13
PMW-2	595.97	1028371.75	1136875.46	7.05	588.915
PMW-3	595.92	1028381.51	1136882.58	6.53	589.387
PMW-4	597.04	1028384.66	1136909.81	8.10	588.938
PMW-5	592.77	1028308.68	1136764.78	4.50	588.27
PMW-6	592.75	1028310.43	1136747.75	4.68	588.07
PMW-7	593.14	1028325.48	1136758.01	5.05	588.09
PMW-8	593.10	1028352.65	1136824.49	4.97	588.13
PMW-9	592.69	1028282.56	1136689.23	4.38	588.31
INJ-1	596.03	1028382.49	1136887.35	7.00	589.032
INJ-2	595.88	1028374.60	1136890.67	7.13	588.745
INJ-3	592.91	1028313.26	1136774.58	4.79	588.12
INJ-4	593.26	1028332.70	1136771.36	5.04	588.22
MW-7A	596.59	1028377.01	1136884.31	7.17	589.42
MW-7B	596.66	1028379.67	1136889.32	8.03	588.63
MW-17A	593.11	1028319.95	1136765.12	4.46	588.65
MW-17B	592.90	1028319.47	1136763.38	4.84	588.06
MW-3A	599.94	1028627.22	1136895.86		599.94
MW-3B	599.70	1028624.57	1136899.80		
MW-1A	597.56	1028606.44	1136554.99		
MW-1B	597.64	1028611.01	1136554.66		
MW-2A	595.73	1028335.27	1136881.61	5.89	589.84
MW-2B	595.80	1028337.08	1136888.34	7.62	588.18
MW-4A	591.60	1028027.77	1136890.77		
MW-4B	591.49	1028023.72	1136890.65		
MW-5A	597.91	1028256.93	1136567.66	10.26	587.65
MW-5B	597.79	1028256.86	1136562.36	9.79	588
MW-6	595.51	1028293.24	1136889.98	7.40	588.11
MW-8	599.63	1028584.29	1136897.91	10.70	588.93
MW-10A	596.87	1028134.19	1136571.96	9.34	587.53
MW-10B	596.71	1028129.79	1136571.87	8.72	587.99
MW-11A	595.48	1027992.43	1136576.28	8.50	586.98
MW-11B	595.57	1027996.44	1136575.70	8.44	587.13
MW-12A	590.79	1027887.31	1136654.88	4.50	586.29
MW-12B	590.89	1027886.62	1136658.22	2.85	588.04
MW-13B	594.73	1028199.59	1136517.64	7.13	
MW-14B	593.30	1027951.16	1136524.55	5.39	
MW-15	592.01	1027851.99	1136475.97		
MW-16A	591.64	1028415.02	1136829.41	4.01	587.63
MW-16B	592.38	1028414.66	1136826.44	3.61	588.77
MW-18A	593.78	1028377.39	1136661.13	5.16	588.62
MW-18B	593.43	1028375.07	1136659.79	5.32	588.11
MW-19A	594.95	1028610.90	1136747.47		
MW-19B	594.65	1028611.64	1136749.89	5.75	588.9

TABLE 3.2
VOCS RESULTS SUMMARY

Well ID	Date	Months from Injection	PCE mg/L	TCE mg/L	cis-1,2-DCE mg/L	trans-DCE mg/L	1,1-DCE mg/L	Total DCE mg/L	VC mg/L	Ethene mg/L	Ethane mg/L	Ethane + Ethane mg/L	Methane mg/L	TCA mg/L	1,1-DCA mg/L
PMW-1	11-Aug-08	0.0	0.8 U	280	330	1.4 J	13	344.4	57	4.3 J	3.7 J	8	98	#N/A	74
	7-Oct-08	1.1	0.8 U	47	350	1.2 J	6.2	357.4	53	4.7 J	2 J	6.7	130 J	0.8 U	39
	9-Dec-08	3.2	0.8 U	3.7 J	320	1.2 J	2.3 J	323.5	72	16	8.7	24.7	160	0.8 U	26
	27-Jan-09	4.9	0.8 U	6.9	240	0.85 J	1.7 J	242.55	67	27	4.9 J	31.9	980	0.8 U	38
	16-Mar-09	6.5	0.8 U	15	260	1.3 J	2.9 J	264.2	100	22	1.7 J	23.7	1000	0.8 U	23
	15-Oct-09	13.6	0.8 U	1.6 J	120	1.6 J	0.8 U	122.4	74	170	7 U	177	7800	0.8 U	51
	15-Dec-09	15.6	0.8 U	1.2 J	67	1 J	0.89 J	68.89	89	78	5.2	83.2	4600	0.8 U	21
	9-Feb-10	17.5	0.8 U	1 U	22	0.8 U	0.8 U	23.6	36	71	1.7 J	72.7	7900	0.8 U	18
	31-Mar-10	19.1	0.8 U	1.5 J	31	0.94 J	0.8 U	32.74	50	100	4.2 J	104.2	8800	0.8 U	9.6
	7-May-10	20.4	0.8 U	5.8	42	0.8 U	0.8 U	43.6	25	74	2.4 J	76.4	7800	0.8 U	7
PMW-2	11-Aug-08	0.0	4 U	3600	2700	11 J	39	2750	38	5.2 J	2.4 J	7.6	150 J	5.7 J	180
	7-Oct-08	1.1	3.2 U	5600	3500	15 J	67	3582	53	6.5	1.6 J	8.1	130 J	14 J	260
	10-Dec-08	3.3	16 U	7400	5800	18 J	95 J	5913	63 J	4.8 J	1 U	5.8	47	21 J	430
	27-Jan-09	4.9	4 U	2500	3200	14 J	47	3261	150	15	1 U	16	140	7.8 J	200
	18-Mar-09	6.5	8 U	3400	4200	16 J	81	4297	120	12	1 U	13	110	11 J	320
	15-Oct-09	13.6	4 U	4600	5600	20 J	76	5696	130	16	1 U	17	120	11 J	330
	10-Dec-09	15.4	8 U	3600	7100	34 J	82	7216	53	22	1 U	23	250	12 J	330
	11-Feb-10	17.5	8 U	2900	4300	24 J	72	4396	71	41	1 U	42	1800	11 J	340
	30-Mar-10	19.1	4 U	4200	5200	26	100	5326	49	#N/A	#N/A	#N/A	#N/A	12 J	410
	7-May-10	20.4	4 U	4700	5400	26	120	5546	52	21	1 U	22	170	16 J	450
PMW-3	13-Aug-08	0.0	0.8 U	270	460	4 J	2.5 J	466.5	39	3 J	2.9 J	5.9	120	0.8 U	10
	8-Oct-08	1.2	1.6 U	680	3600	19	10	3629	65	14	4.1 J	18.1	100 J	1.6 U	19
	8-Dec-08	3.2	1.6 U	11	1100	4.3 J	2.9 J	1107.2	66	9.7	1 J	10.7	160	1.6 U	8.6 J
	27-Jan-09	4.9	4 U	34	4300	20 J	9.3 J	4329.3	420	44	1 U	45	92	4 U	47
	17-Mar-09	6.5	1.6 U	13	900	7.5 J	2.1 J	909.6	310	91	1.1 J	92.1	320	1.6 U	13
	15-Oct-09	13.6	0.8 U	10	340	1.4 J	1 J	342.4	57	200	3.8 J	203.8	3200	0.8 U	5.7
	14-Dec-09	15.6	0.8 U	6.6	260	2.7 J	1.2 J	263.9	73	750	22.0	772	11000	0.8 U	8.9
	9-Feb-10	17.5	1.6 U	47	650	4.4 J	2.1 J	656.5	340	670	32.0	702	16000	1.6 U	24
	31-Mar-10	19.1	1.6 U	180	1300	6.5 J	4.6 J	1311.1	260	440	67.0	507	17000	1.6 U	23
	7-May-10	20.4	1.6 U	210	1100	5.2 J	3.8 J	1109	310	650	64	714	22000	1.6 U	19
PMW-4	13-Aug-08	0.0	0.8 U	8.4	2.7 U	0.8 U	0.8 U	4.3	1 U	1 U	4 J	5	12	0.8 U	1 U
	7-Oct-08	1.1	0.8 U	2.3 J	20	0.8 U	0.8 U	21.6	14	1.9 J	4.3 J	6.2	180 J	0.8 U	1 U
	10-Dec-08	3.3	0.8 U	9.8	15	0.8 U	0.8 U	16.6	11	1 U	1.7 J	2.7	87	0.8 U	1 U
	27-Jan-09	4.9	0.8 U	1.7 J	34	0.8 U	0.8 U	35.6	26	1.2 J	1 U	2.2	130	0.8 U	1 U
	18-Mar-09	6.5	0.8 U	1.3 J	40	0.8 U	0.8 U	41.6	26	1 U	1 U	2	93	0.8 U	1 U
	15-Oct-09	13.6	0.8 U	1 J	33	0.8 U	0.8 U	34.6	23	1 U	1 U	2	76	0.8 U	1 U
	10-Dec-09	15.4	0.8 U	1 U	24	0.8 U	0.8 U	25.6	16	1 U	1 U	2	59	0.8 U	1 U
	11-Feb-10	17.5	0.8 U	1 U	22	0.8 U	0.8 U	23.6	23	1 U	1 U	2	80	0.8 U	1 U
	31-Mar-10	19.1	0.8 U	1 U	31	0.8 U	0.8 U	32.6	24	#N/A	#N/A	#N/A	#N/A	0.8 U	1 U
	10-May-10	20.5	0.8 U	1 U	31	0.8 U	0.8 U	32.6	27	1 U	1 U	2	80	0.8 U	1 U

TABLE 3.2
VOCS RESULTS SUMMARY

Well ID	Date	Months from Injection	PCE	TCE	cis-1,2-DCE	trans-DCE	1,1-DCE	Total DCE	VC	Ethene	Ethane	Ethane + Ethane	Methane	TCA	1,1-DCA
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
PMW-5	20-Oct-09	0.0	0.8	1	140	2.3	0.8	143.1	94	100	2.8	102.8	290	0.8	6.5
	15-Dec-09	1.1	0.8	1.8	100	2.8	0.8	103.6	44	110	3.8	113.8	270	0.8	7.8
	10-Feb-10	3.0	0.8	2.2	50	5	0.8	55.8	150	200	8.5	208.5	4400	0.8	10
	31-Mar-10	4.6	0.8	1.9	31	4.4	0.8	36.2	58	310	13.0	323	10000	0.8	9.2
	7-May-10	5.8	0.8	2.2	24	5	0.8	29.8	62	400	12.0	412	12000	0.8	8.1
PMW-6	19-Oct-09	0.0	0.8	2.8	130	2.4	0.8	133.2	71	80	3.3	83.3	180	0.8	6.5
	15-Dec-09	1.1	0.8	1	63	2.9	0.8	66.7	120	160	3.0	163	180	0.8	6.9
	10-Feb-10	3.0	0.8	1	14	3	0.8	17.8	55	340	5.7	345.7	3600	0.8	6.9
	30-Mar-10	4.6	0.8	1	10	2.6	0.8	13.4	43	400	1.0	401	9100	0.8	5.9
	7-May-10	5.8	0.8	1	15	2.9	0.8	18.7	56	430	7.4	437.4	12000	0.8	5.8
PMW-7	19-Oct-09	0.0	0.8	7	200	2.3	1.2	203.5	72	46	2.2	48.2	180	0.8	5.8
	16-Dec-09	1.1	0.8	2.8	210	2.9	0.8	213.7	210	150	4.9	154.9	190	0.8	3.3
	10-Feb-10	3.0	0.8	2.1	86	4.3	0.8	91.1	230	240	3.6	243.6	4400	0.8	3.7
	1-Apr-10	4.6	0.8	1	40	2.5	0.8	43.3	53	300	5.3	305.3	7500	0.8	2.8
	7-May-10	5.8	0.8	13	92	2.3	1.6	95.9	55	250	4.2	254.2	6000	0.8	11
PMW-8	12-Aug-08	0.0	0.8 U	1 U	78	0.99 J	0.8 U	79.79	83	4 J	1 U	5	140	0.8 U	1 U
	6-Oct-08	1.1	0.8 U	1 U	92	0.92 J	0.8 U	93.72	85	5.4	1 U	6.4	170 J	0.8 U	1 U
	8-Dec-08	3.2	0.8 U	1 U	77	0.8 U	0.8 U	78.6	83	12	1 U	13	180	0.8 U	1 U
	27-Jan-09	4.9	0.8 U	1 U	51	0.8 U	0.8 U	52.6	80	19	1 U	20	130	0.8 U	1 U
	18-Mar-09	6.5	0.8 U	1 U	40	0.8 U	0.8 U	41.6	56	27	1 U	28	140	0.8 U	1 U
	19-Oct-09	13.7	0.8 U	1 U	38	0.8 U	0.8 U	39.6	58	13	1 U	14	170	0.8 U	1 U
	15-Dec-09	15.6	0.8 U	1 U	63	0.8 U	0.8 U	64.6	79	11	1 U	12	120	0.8 U	1 U
	9-Feb-10	17.5	0.8 U	1 U	40	0.8 U	0.8 U	41.6	90	44	1 U	45	220	0.8 U	1 U
	30-Mar-10	19.1	0.8 U	1 U	75	0.8 U	0.8 U	76.6	110	#N/A	#N/A	#N/A	#N/A	0.8 U	1 U
	7-May-10	20.4	0.8 U	1 U	92	0.8 U	0.8 U	93.6	130	82	1 U	83	1000	0.8 U	1 J
PMW-9	19-Oct-09	0.0	0.8	1	92	0.81	0.8	93.61	88	86	1.6	87.6	280	0.8	9.4
	16-Dec-09	1.1	0.8	1	450	4.1	0.8	454.9	270	110	3.0	113	160	0.8	3.3
	10-Feb-10	3.0	0.8	1	270	3.5	0.8	274.3	280	220	1.3	221.3	280	0.8	3.2
	30-Mar-10	4.6	0.8	1	300	3.4	0.8	304.2	250	#N/A	#N/A	#N/A	#N/A	0.8	2.9
	7-May-10	5.8	0.8	1	200	1.8	0.8	202.6	230	230	1.4	231.4	710	0.8	3.3
INJ-01	13-Aug-08	0.0	0.8 U	85	470	1.9	6.8	478.7	47	2.5 J	2.1 J	4.6	140	1.2 J	37
	8-Oct-08	1.2	0.8 U	21	340	1.5 J	3.4 J	344.9	58	3.9 J	1 U	4.9	150 J	0.8 U	19
	9-Dec-08	3.2	1.6 U	5.6 J	1000	3.4 J	6.2 J	1009.6	110	11	1 U	12	190	1.6 U	45
	27-Jan-09	4.9	0.8 U	8.7	830	3.8 J	5.4	839.2	200	21	1 U	22	320	0.8 U	50
	17-Mar-09	6.5	0.8 U	6.2	550	3.1 J	3.6 J	556.7	170	25	1 U	26	710	0.8 U	33
	15-Oct-09	13.6	0.8 U	16	730	4.7 J	2.5 J	737.2	240	140	3 U	143	2700	0.8 U	26
	14-Dec-09	15.6	0.8 U	7.8	280	3.5 J	0.95 J	284.45	280	270	12.0	282	7200	0.8 U	18
	11-Feb-10	17.5	0.8 U	7.8	300	5.1	1.7 J	306.8	290	360	6.0	366	13000	0.8 U	55
	1-Apr-10	19.2	1.6 U	69	880	7.3 J	3.5 J	890.8	400	390	10.0	400	14000	1.6 UJ	52
	10-May-10	20.5	0.8 U	90	600	7.6	2.8 J	610.4	270	450	9.8	459.8	36000	0.8 U	48

TABLE 3.2
VOCS RESULTS SUMMARY

Well ID	Date	Months from Injection	PCE mg/L	TCE mg/L	cis-1,2-DCE mg/L	trans-DCE mg/L	1,1-DCE mg/L	Total DCE mg/L	VC mg/L	Ethene mg/L	Ethane mg/L	Ethane + Ethane mg/L	Methane mg/L	TCA mg/L	1,1-DCA mg/L
INJ-02	12-Aug-08	0.0		79 J	66	0.8 U	1.1 J	67.9	38	2.4 J	1.5 J	3.9	120 J	0.8 U	5.4 J
	7-Oct-08	1.1	0.8 U	87	170	0.8 U	4 J	174.8	47	3.4 J	1 U	4.4	200 J	0.8 U	22
	9-Dec-08	3.2	0.8 U	14	170	0.81 J	1.9 J	172.71	44	4.3 J	1 U	5.3	160	0.8 U	9.4
	27-Jan-09	4.9	0.8 U	3.7 J	150	0.8 U	1.2 J	152	64	6.6	1 U	7.6	210	0.8 U	8.7
	18-Mar-09	6.5	0.8 U	5.4	150	0.82 J	1.9 J	152.72	56	8.8	1 U	9.8	260	0.8 U	10
	15-Oct-09	13.6	0.8 U	11	110	0.8 U	2.2 J	113	75	38	1 U	39	970	0.8 U	22
	10-Dec-09	15.4	0.8 U	2.9 J	150	1.3 J	2.5 J	153.8	78	61	2.7 J	63.7	1400	0.8 U	28
	11-Feb-10	17.5	0.8 U	2.8 J	34	0.8 U	0.8 U	35.6	44	30	1 U	31	4300	0.8 U	13
	1-Apr-10	19.2	0.8 U	2.6 J	50	1.1 J	0.8 U	51.9	62	81	1 U	82	7100	0.8 UJ	16
	10-May-10	20.5	0.8 U	2.1 J	26 J	0.8 U	0.8 U	27.6	31 J	68	2.4 J	70.4	7900	0.8 U	11
INJ-03	20-Oct-09	0.0	0.8	1	130	1.7	0.8	132.5	78	85	1.2	86.2	240	0.8	6
	15-Dec-09	1.1	0.8	1	140	2.2	0.8	143	85	92	3.1	95.1	210	0.8	6.9
	9-Feb-10	2.9	0.8	1	51	2.8	0.8	54.6	170	140	9.9	149.9	3300	0.8	7
	31-Mar-10	4.6	0.8	1.4	89	3	0.8	92.8	170	140	10.0	150	8700	0.8	5.3
	10-May-10	5.9	0.8	1.7	71	3	0.8	74.8	160	220	17.0	237	13000	0.8	6.4
INJ-04	20-Oct-09	0.0	0.8	4	450	5	2.1	457.1	120	21	1.8	22.8	160	0.8	12
	10-Dec-09	0.9	0.8	2.5	250	3.3	1.1	254.4	170	250	3.4	253.4	270	0.8	17
	9-Feb-10	2.9	0.8	1	17	3.1	0.8	20.9	60	540	16.0	556	12000	0.8	22
	1-Apr-10	4.6	0.8	1	4	3.2	0.8	8	17	700	16.0	716	14000	0.8	28
	10-May-10	5.9	0.8	1	11	4.3	0.8	16.1	31	650	11.0	661	15000	0.8	32
MW-7A	12-Aug-08	0.0	2 U	270	1800	5.9 J	34	1839.9	130	7.2	1 U	8.2	21	4.1 J	280
	8-Oct-08	1.2	0.8 U	58	1800	3.5 J	25	1828.5	210	12	1 U	13	21 J	0.8 U	250
	9-Dec-08	3.2	1.6 U	4.3 J	1100	1.7 J	9.6 J	1111.3	180	27	1 U	28	24	1.6 U	150
	27-Jan-09	4.9	0.8 U	3.2 J	840	2.4 J	7.6	850	390	51	1 U	52	110	0.8 U	230
	17-Mar-09	6.5	0.8 U	2.9 J	620	1.5 J	3.6 J	625.1	250	69	1 U	70	210	0.8 U	140
	15-Oct-09	13.6	0.8 U	2.7 J	120	0.8 U	0.8 U	121.6	240	110	2 U	112	760	0.8 U	56
	14-Dec-09	15.6	0.8 U	1 U	140	0.8 U	0.8 U	141.6	100	100	5.1	105.1	1900	0.8 U	47
	9-Feb-10	17.5	0.8 U	1 U	77	0.8 U	0.8 U	78.6	84	92	1.1 J	93.1	1200	0.8 U	48
	1-Apr-10	19.2	0.8 U	1 U	22	0.8 U	0.8 U	23.6	49	#N/A	#N/A	#N/A	#N/A	0.8 UJ	39
	6-May-10	20.3	0.8 U	1 U	65	0.8 U	0.8 U	66.6	50	1 U	1 U	2	5 U	0.8 U	39
MW-7B	12-Aug-08	0.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-Oct-08	1.1	0.8 UJ	1 UJ	19 J	0.8 UJ	0.8 UJ	20.6	29 J	3.1 J	1 U	4.1	220 J	0.8 UJ	1 UJ
	9-Dec-08	3.2	0.8 U	1 U	21	0.8 U	0.8 U	22.6	33	4.1 J	1 U	5.1	250	0.8 U	1 U
	27-Jan-09	4.9	0.8 U	1 U	13	0.8 U	0.8 U	14.6	29	3.3 J	1 U	4.3	220	0.8 U	1 U
	17-Mar-09	6.5	0.8 U	1 U	20	0.8 U	0.8 U	21.6	30	2.1 J	1 U	3.1	150	0.8 U	1 U
	15-Oct-09	13.6	0.8 U	1 U	7.1	0.8 U	0.8 U	8.7	39	3.3 J	1 U	4.3	340	0.8 U	1 U
	14-Dec-09	15.6	0.8 U	1 U	7.7	0.8 U	0.8 U	9.3	24	3.6 J	1 U	4.6	260	0.8 U	1 U
	9-Feb-10	17.5	0.8 U	1 U	3.2 J	0.8 U	0.8 U	4.8	21	6.1	1 U	7.1	650	0.8 U	1 U
	31-Mar-10	19.1	0.8 U	1 U	3.8 J	0.8 U	0.8 U	5.4	29	#N/A	#N/A	#N/A	#N/A	0.8 U	1 U
	6-May-10	20.3	0.8 U	1 U	4.5 J	0.8 U	0.8 U	6.1	31	1 U	1 U	2	5 U	0.8 U	1 U

TABLE 3.2
VOCS RESULTS SUMMARY

Well ID	Date	Months from Injection	PCE	TCE	cis-1,2-DCE	trans-DCE	1,1-DCE	Total DCE	VC	Ethene	Ethane	Ethene + Ethane	Methane	TCA	1,1-DCA
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-10B	16-Oct-09	0.0	<i>0.8 U</i>	<i>1 U</i>	420	3.1 J	<i>0.8 U</i>	423.9	120	2.7 J	<i>1 U</i>	3.7	110	<i>0.8 U</i>	<i>1 U</i>
	16-Dec-09	1.1	<i>0.8 U</i>	<i>1 U</i>	750	9	<i>0.8 U</i>	759.8	260	12	<i>3 U</i>	15	110	<i>0.8 U</i>	<i>1 U</i>
	10-Feb-10	3.0	<i>0.8 U</i>	<i>1 U</i>	300	4 J	<i>0.8 U</i>	304.8	120	3.7 J	<i>1 U</i>	4.7	92	<i>0.8 U</i>	<i>1 U</i>
	30-Mar-10	4.6	<i>0.8 U</i>	<i>1 U</i>	270	3.1 J	<i>0.8 U</i>	273.9	90	#N/A	#N/A	#N/A	#N/A	<i>0.8 U</i>	<i>1 U</i>
	6-May-10	5.8	<i>0.8 U</i>	<i>1 U</i>	220	2 J	<i>0.8 U</i>	222.8	83	<i>1 U</i>	<i>1 U</i>	2	<i>5 U</i>	<i>0.8 U</i>	<i>1 U</i>
MW-11B	16-Oct-09	0.0	<i>0.8 U</i>	<i>1 U</i>	64	<i>0.8 U</i>	<i>0.8 U</i>	65.6	73	14	<i>1 U</i>	15	170	<i>0.8 U</i>	<i>1 U</i>
	16-Dec-09	1.1	<i>0.8 U</i>	<i>1 U</i>	5.3	<i>0.8 U</i>	<i>0.8 U</i>	6.9	17	81	<i>1 U</i>	82	190	<i>0.8 U</i>	<i>1 U</i>
	10-Feb-10	3.0	<i>0.8 U</i>	<i>1 U</i>	2.3 J	<i>0.8 U</i>	<i>0.8 U</i>	3.9	11	130	<i>1 U</i>	131	760	<i>0.8 U</i>	<i>1 U</i>
	30-Mar-10	4.6	<i>0.8 U</i>	<i>1 U</i>	2.1 J	<i>0.8 U</i>	<i>0.8 U</i>	3.7	7.1	#N/A	#N/A	#N/A	#N/A	<i>0.8 U</i>	<i>1 U</i>
	6-May-10	5.8	<i>0.8 U</i>	<i>1 U</i>	1.9 J	<i>0.8 U</i>	<i>0.8 U</i>	3.5	7.4	<i>1 U</i>	<i>1 U</i>	2	<i>5 U</i>	<i>0.8 U</i>	1.3 J
MW-17A	12-Aug-08	0.0	<i>0.8 U</i>	40	190	2.5 J	11	203.5	24	1.5 J	<i>1 U</i>	2.5	120	<i>0.8 U</i>	21
	7-Oct-08	1.1	<i>0.8 U</i>	43	200	3.5 J	13	216.5	23	1.3 J	<i>1 U</i>	2.3	120 J	<i>0.8 U</i>	23
	10-Dec-08	3.3	<i>0.8 U</i>	39	210	2.2 J	12	224.2	27	1.1 J	<i>1 U</i>	2.1	65	<i>0.8 U</i>	25
	26-Jan-09	4.8	<i>0.8 U</i>	32	210	2.1 J	11	223.1	29	1.4 J	<i>1 U</i>	2.4	88	<i>0.8 U</i>	23
	16-Mar-09	6.5	<i>0.8 U</i>	29	210	2.5 J	12	224.5	28	1.4 J	<i>1 U</i>	2.4	78	<i>0.8 U</i>	20
	20-Oct-09	13.7	<i>0.8 U</i>	24	200	2.2 J	14	216.2	24	<i>1 U</i>	<i>1 U</i>	0	120	<i>0.8 U</i>	29
	11-Dec-09	15.5	<i>0.8 U</i>	11	200	1.4 J	13	214.4	29	<i>1 U</i>	<i>1 U</i>	0	100	<i>0.8 U</i>	28
	9-Feb-10	17.5	<i>0.8 U</i>	14	210	1.3 J	11	222.3	34	<i>1 U</i>	<i>1 U</i>	2	110	<i>0.8 U</i>	24
	30-Mar-10	19.1	<i>0.8 U</i>	11	180	1.7 J	10	191.7	24	#N/A	#N/A	#N/A	#N/A	<i>0.8 U</i>	20
	6-May-10	20.3	<i>0.8 U</i>	15	210	1.4 J	11	222.4	27	<i>1 U</i>	<i>1 U</i>	2	<i>5 U</i>	<i>0.8 U</i>	20
MW-17B	12-Aug-08	0.0	#N/A	4.6 J	630	8.5	#N/A	638.5	82	4	0.53 J	4.53	160	#N/A	17
	8-Oct-08	1.2	<i>0.8 U</i>	3.3 J	600	5.9	4.4 J	610.3	120	6.6	<i>1 U</i>	7.6	170 J	<i>0.8 U</i>	22
	10-Dec-08	3.3	<i>0.8 U</i>	2.6 J	260	3.1 J	2.9 J	266	170	33	<i>1 U</i>	34	120	<i>0.8 U</i>	28
	26-Jan-09	4.8	<i>0.8 U</i>	2.1 J	280	4.2 J	3.1 J	287.3	210	61	<i>1 U</i>	62	130	<i>0.8 U</i>	24
	17-Mar-09	6.5	<i>0.8 U</i>	1.6 J	270	3.6 J	3.2 J	276.8	180	71	<i>1 U</i>	72	180	<i>0.8 U</i>	22
	16-Oct-09	13.6	<i>0.8 U</i>	4.2 J	280 J	2.4 J	4.5 J	286.9	73	22	3 J	0	120	<i>0.8 U</i>	29
	11-Dec-09	15.5	<i>0.8 U</i>	2.2 J	170	2.4 J	<i>0.8 U</i>	173.2	160	130	2.4 J	0.2	300	<i>0.8 U</i>	8.4
	9-Feb-10	17.5	<i>0.8 U</i>	1.2 J	31	1.8 J	<i>0.8 U</i>	33.6	52	190	4.2 J	194.2	4400	<i>0.8 U</i>	31
	30-Mar-10	19.1	<i>0.8 U</i>	<i>1 U</i>	5.9	1.7 J	<i>0.8 U</i>	8.4	10	#N/A	#N/A	#N/A	#N/A	<i>0.8 U</i>	37
	6-May-10	20.3	<i>0.8 U</i>	<i>1 U</i>	8.5	1.4 J	<i>0.8 U</i>	10.7	9.6	<i>1 U</i>	<i>1 U</i>	2	<i>5 U</i>	<i>0.8 U</i>	45
MW-3A	12-Aug-08	0.0	<i>0.8 U</i>	<i>1 U</i>	0.89 J	<i>0.8 U</i>	<i>0.8 U</i>	2.49	<i>1 U</i>	<i>1 U</i>	<i>1 U</i>	2	25	<i>0.8 U</i>	<i>1 U</i>
	6-Oct-08	1.1	<i>0.8 U</i>	1.9 J	11	<i>0.8 U</i>	<i>0.8 U</i>	12.6	<i>1 U</i>	<i>1 U</i>	<i>1 U</i>	2	19 J	<i>0.8 U</i>	<i>1 U</i>
	8-Dec-08	3.2	<i>0.8 U</i>	1.4 J	<i>0.8 U</i>	<i>0.8 U</i>	<i>0.8 U</i>	2.4	<i>1 U</i>	<i>1 U</i>	<i>1 U</i>	2	7.7 J	<i>0.8 U</i>	<i>1 U</i>
	26-Jan-09	4.8	<i>0.8 U</i>	<i>1 U</i>	1 J	<i>0.8 U</i>	<i>0.8 U</i>	2.6	<i>1 U</i>	<i>1 U</i>	<i>1 U</i>	2	7.3 J	<i>0.8 U</i>	<i>1 U</i>
	16-Mar-09	6.5	<i>0.8 U</i>	<i>1 U</i>	0.99 J	<i>0.8 U</i>	<i>0.8 U</i>	2.59	<i>1 U</i>	<i>1 U</i>	<i>1 U</i>	2	5 J	<i>0.8 U</i>	<i>1 U</i>

Notes:
ITALICIZED VALUES REPRESENT DETECTION LIMIT WHEN THE PARAMETER WAS NOT DETECTED
INJECTIONS OF SUBSTRATE WERE COMPLETED IN JUNE-08 AND NOV-09
J = ESTIMATED VALUE
U = BELOW DETECTION LIMITS
UJ = ESTIMATED NON-DETECT POSSIBLY BIASED LOW
#N/A = NOT SAMPLED
CONCENTRATIONS FOR BASELINE EVENT AT MW-17B WERE TAKEN FROM APRIL 2008 GROUNDWATER SAMPLING.

**TABLE 3.3
LABORATORY RESULTS FOR GEOCHEMICAL PARAMETERS**

Well ID	Date	Months from Injection	Total Organic Carbon mg/L	Arsenic mg/L	Manganese mg/L	Selenium mg/L	Chloride mg/L	Bromide mg/L	Sulfate mg/L	Acetic Acid mg/L	Butyric Acid mg/L	Lactic Acid mg/L	Propionic Acid mg/L	Pyruvic Acid mg/L	Total Volatile Fatty Acids mg/l
PMW-1	11-Aug-08	0	4.2	#N/A	#N/A	#N/A	115	2 U	291	1 U	1 U	1 U	1 U	4 U	4 U
	7-Oct-08	1	75.3	#N/A	#N/A	#N/A	97.7 J	2 U	160	152.1	2.9	1 U	10.1	4 U	170.1
	9-Dec-08	3	12	#N/A	#N/A	#N/A	78.9	2 U	245	16.1	1 UJ	1 U	1 U	4 U	16.1
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6	10.2	#N/A	#N/A	#N/A	88.7	2 U	224	49.9	7.9	1 U	1 U	4 U	63.8
	15-Oct-09	14	34.2	#N/A	#N/A	#N/A	71.4	2 U	163	79	1 U	25 U	2.2	10 U	81.2
	15-Dec-09	16	79.8	#N/A	#N/A	#N/A	62 J	2.4 J	20.1 J	150	4.2	25 U	8.4	10 U	197.6
	9-Feb-10	17	41.4 J	#N/A	#N/A	#N/A	72.6	2 U	28	76	1 U	25 U	1.6	10 U	113.6
	31-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	20	12.5	#N/A	#N/A	#N/A	49.4 UJ	2 UJ	50.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-2	11-Aug-08	0	4.4	#N/A	#N/A	#N/A	88.6	2 U	288	1 U	1 U	1 U	1 U	4 U	4 U
	7-Oct-08	1	28.5	#N/A	#N/A	#N/A	91.8 J	2 U	275	64.2	1 U	1 U	1 U	4 U	64.2
	10-Dec-08	3	4	#N/A	#N/A	#N/A	45.5	2 U	295	1.6	1 UJ	1 U	1 U	4 U	1.6
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	18-Mar-09	7	4.1	#N/A	#N/A	#N/A	86.6	2 U	327	1 U	1 U	1 U	1 U	4 U	4 U
	15-Oct-09	14	3.5	#N/A	#N/A	#N/A	58.6	2 U	295	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-Dec-09	15	23	#N/A	#N/A	#N/A	41.2 J	2 U	292 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	11-Feb-10	18	15.5	#N/A	#N/A	#N/A	31.8 J	2 U	310 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	30-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	20	4	#N/A	#N/A	#N/A	24.9 J	2 UJ	311	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-3	13-Aug-08	0	4.4	0.0102 U	0.10	0.0107 U	106	2 U	289	1 U	1 U	1 U	1 U	4 U	4 U
	8-Oct-08	1	91.2	0.0102 U	0.34	0.0107 U	92.3 J	2 U	175	290.6	7	1 U	17.3	4 U	314.9
	8-Dec-08	3	18.7	0.01 U	0.11	0.0107 U	92.6	2 U	213	22.1	1 UJ	1 U	1 U	4 U	22.1
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	17-Mar-09	7	22.6	0.01 U	0.10	0.0107 U	93.5	2 U	273	22.3	1 U	1 U	1 U	4 U	22.3
	15-Oct-09	14	20.3	0.0072 U	0.10	#N/A	85.9	2 U	208	41	1 U	25 U	1 U	10 U	4 U
	14-Dec-09	16	164	0.0072 U	0.28	#N/A	29 J	3.1	22.3 J	220	8.3	25 U	17.0	10 U	4 U
	9-Feb-10	17	153 J	0.0072 U	0.16	#N/A	29.9	2 U	11.7	230	10	120 U	4.6	50 U	4 U
	31-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4 U
	7-May-10	20	104	0.0072 U	0.187	#N/A	22.3 J	2 UJ	7.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

**TABLE 3.3
LABORATORY RESULTS FOR GEOCHEMICAL PARAMETERS**

Well ID	Date	Months from Injection	Total Organic Carbon mg/L	Arsenic mg/L	Manganese mg/L	Selenium mg/L	Chloride mg/L	Bromide mg/L	Sulfate mg/L	Acetic Acid mg/L	Butyric Acid mg/L	Lactic Acid mg/L	Propionic Acid mg/L	Pyruvic Acid mg/L	Total Volatile Fatty Acids mg/l
PMW-4	13-Aug-08	0	4.3	#N/A	#N/A	#N/A	110	2 U	331	1 U	1 U	1 U	1 U	4 U	4 U
	7-Oct-08	1	3.7	#N/A	#N/A	#N/A	101 J	2 U	256	1 U	1 U	1 U	1 U	4 U	4 U
	10-Dec-08	3	2.8	#N/A	#N/A	#N/A	94.8	2 U	236	1 U	1 UJ	1 U	1 U	4 U	4 U
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	18-Mar-09	7	3.4	#N/A	#N/A	#N/A	107	2 U	312	1 U	1 U	1 U	1 U	4 U	4 U
	15-Oct-09	14	3.1	#N/A	#N/A	#N/A	86.9	2 U	229	1 U	1 U	25 U	1 U	10 U	4 U
	10-Dec-09	15	3.6	#N/A	#N/A	#N/A	78.8 J	2 U	226 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	11-Feb-10	18	2.9	#N/A	#N/A	#N/A	87.2 J	20 U	260 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	31-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
10-May-10	20	3	#N/A	#N/A	#N/A	70.7	2 U	222	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
PMW-5	20-Oct-09	0	4.6	0.0072 U	0.04	#N/A	139 J	2 U	266 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	15-Dec-09	1	772	0.0072 U	0.32	#N/A	163 J	65.6	11.6 J	490	17	16 J	360.0	10 U	883
	10-Feb-10	3	563 J	0.0072 U	0.37	#N/A	273	36.6	15.4	640	82	120 U	310.0	50 U	50 U
	31-Mar-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	6	613	0.0072 U	0.518	#N/A	137 J	18.5 J	8.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-6	19-Oct-09	0	4.3	#N/A	#N/A	#N/A	202	2	260	1	1	25	1	10	4U
	15-Dec-09	1	383	#N/A	#N/A	#N/A	159	33	10.1	470	6.3	25	290	10	766
	10-Feb-10	3	290	#N/A	#N/A	#N/A	144	16	12.7	400	20	120	160	50	50
	30-Mar-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	6	296	#N/A	#N/A	#N/A	147	9	11.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-7	19-Oct-09	0	4.3	#N/A	#N/A	#N/A	159	2	267	1	1	25	1	10	4U
	16-Dec-09	1	230	#N/A	#N/A	#N/A	135	14	59.6	280	5	120	61	50	341
	10-Feb-10	3	158	#N/A	#N/A	#N/A	131	8	41.6	280	12	120	110	50	50
	1-Apr-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	6	85.9	#N/A	#N/A	#N/A	318	2	63.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-8	12-Aug-08	0	4.3	#N/A	#N/A	#N/A	110	2 U	331	1 U	1 U	1 U	1 U	4 U	4 U
	6-Oct-08	1	11.9	0.0102 U	0.06	0.0107 U	116 J	2 U	307	17.9	1 U	1 U	1 U	4 U	17.9
	8-Dec-08	3	6.2	0.01 U	0.07	0.0107 U	119	2 U	309	1.5	1 UJ	1 U	1 U	4 U	1.5
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	18-Mar-09	7	4	0.01 U	0.06	0.0107 U	139	2 U	344	1 U	1 U	1 U	1 U	4 U	4 U
	19-Oct-09	14	4.7	#N/A	#N/A	#N/A	113 J	2 U	295 J	1 U	1 U	25 U	1.4	10 U	1.4
	15-Dec-09	16	4.5	#N/A	#N/A	#N/A	133 J	2.5 J	281 J	1 U	1 U	25 U	1 U	10 U	4 U
	9-Feb-10	17	4.4 J	#N/A	#N/A	#N/A	121	2 U	336	1 U	1 U	25 U	1 U	10 U	4 U
	30-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4 U
	7-May-10	20	6.6	#N/A	#N/A	#N/A	107 J	2 UJ	240	#N/A	#N/A	#N/A	#N/A	#N/A	4 U

**TABLE 3.3
LABORATORY RESULTS FOR GEOCHEMICAL PARAMETERS**

Well ID	Date	Months from Injection	Total Organic Carbon mg/L	Arsenic mg/L	Manganese mg/L	Selenium mg/L	Chloride mg/L	Bromide mg/L	Sulfate mg/L	Acetic Acid mg/L	Butyric Acid mg/L	Lactic Acid mg/L	Propionic Acid mg/L	Pyruvic Acid mg/L	Total Volatile Fatty Acids mg/l
PMW-9	19-Oct-09	0	3.8	#N/A	#N/A	#N/A	323	2	214	1	1	25	1	10	4U
	16-Dec-09	1	4	#N/A	#N/A	#N/A	161	2	215	1	1	25	2	6	4U
	10-Feb-10	3	4.5	#N/A	#N/A	#N/A	136	2	201	1	4.6	25	1	10	10
	30-Mar-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	6	7.9	#N/A	#N/A	#N/A	147	5	134	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
INJ-01	13-Aug-08	0	3.7	#N/A	#N/A	#N/A	85.1	2 U	280	1 U	1 U	1 U	1 U	1 U	1 U
	8-Oct-08	1	37.8	0.0102 U	0.12	0.0107 U	115 J	2 U	227	101.4	1 U	1 U	1 U	4 U	101.4
	9-Dec-08	3	29	#N/A	#N/A	#N/A	59.8	2 U	182	40.8	1 UJ	1 U	1 U	4 U	40.8
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	17-Mar-09	7	7.2	#N/A	#N/A	#N/A	24.6	2 U	260	6.9	1 U	1 U	1 U	4 U	6.9
	15-Oct-09	14	17.2	#N/A	#N/A	#N/A	78.1	2 U	186	1 U	1 U	25 U	1 U	10 U	4 U
	14-Dec-09	16	164	#N/A	#N/A	#N/A	54.4 J	3.6	14.8 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	11-Feb-10	18	85.3	#N/A	#N/A	#N/A	36.7 J	4 U	14.1 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	1-Apr-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-May-10	20	74.9	#N/A	#N/A	#N/A	29.7	2 U	18.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
INJ-02	12-Aug-08	0	3.8	#N/A	#N/A	#N/A	124	2 U	298	1 U	1 U	1 U	1 U	4 U	4 U
	7-Oct-08	1	36.6	#N/A	#N/A	#N/A	138 J	2 U	230	86.8	1.1	1 U	1 U	4 U	86.8
	9-Dec-08	3	18.5	#N/A	#N/A	#N/A	74.5	2 U	245	13.6	1 UJ	1 U	1 U	4 U	13.6
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	18-Mar-09	7	5.7	#N/A	#N/A	#N/A	116	2 U	297	4.6	1 U	1 U	1 U	4 U	4.6
	15-Oct-09	14	4.8	0.0072 U	0.10	#N/A	99	2 U	250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-Dec-09	15	94.8	0.0072 U	0.18	#N/A	99.9 J	2.5	36.2 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	11-Feb-10	18	32.8	0.0072 U	0.11	#N/A	92.4 J	2 U	52.5 J	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	1-Apr-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-May-10	20	19.1	0.0072 U	0.103	#N/A	85.9	2 U	81.2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
INJ-03	20-Oct-09	0	4.6	#N/A	#N/A	#N/A	137	2	274	1	1	25	1	10	1
	15-Dec-09	1	607	#N/A	#N/A	#N/A	167	34	5.9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	9-Feb-10	3	974	#N/A	#N/A	#N/A	178	21	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	31-Mar-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-May-10	6	928	#N/A	#N/A	#N/A	151	24	5.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

**TABLE 3.3
LABORATORY RESULTS FOR GEOCHEMICAL PARAMETERS**

Well ID	Date	Months from Injection	Total Organic Carbon mg/L	Arsenic mg/L	Manganese mg/L	Selenium mg/L	Chloride mg/L	Bromide mg/L	Sulfate mg/L	Acetic Acid mg/L	Butyric Acid mg/L	Lactic Acid mg/L	Propionic Acid mg/L	Pyruvic Acid mg/L	Total Volatile Fatty Acids mg/l
INJ-04	20-Oct-09	0	4	0	0.08	#N/A	170	2	268	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-Dec-09	1	203	0	0.30	#N/A	260	6	12.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	9-Feb-10	3	319	0	0.54	#N/A	239	4	3.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	1-Apr-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	10-May-10	6	227	0	0.54	#N/A	326	2	9.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
MW-7A	12-Aug-08	0	3.2	0.0102 U	0.05	0.0107 U	22.3	2 U	282	1 U	1 U	1 U	1 U	4 U	4 U
	8-Oct-08	1	143	0.0102 U	0.26	0.0107 U	21.3 J	2 U	60.4	329.1	23.7	1 U	6.4	4 U	359.2
	9-Dec-08	3	25.1	0.01 U	0.05	0.0107 U	24.1	2 U	295	48.4	1 UJ	1 U	1 U	4 U	48.4
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	17-Mar-09	7	8.8	0.01 U	0.05	0.0107 U	0.2 U	2 U	253	12.6	1 U	1 U	1 U	4 U	12.6
	15-Oct-09	14	4.7	#N/A	#N/A	#N/A	21.1	2 U	228	1 U	1 U	25 U	1 U	10 U	4 U
	14-Dec-09	16	207	#N/A	#N/A	#N/A	23.3 J	2.4 J	56.2 J	350	8	25 U	53.0	10 U	411
	9-Feb-10	17	40.1 J	#N/A	#N/A	#N/A	24.1	2 U	87.6	54	1 U	25 U	1 U	10 U	411
	1-Apr-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	411
	6-May-10	20	95.5	#N/A	#N/A	#N/A	20.9 J	2 U	52.2 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	411
MW-7B	12-Aug-08	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	7-Oct-08	1	5	0.0102 U	0.10	0.0107 U	164 J	2 U	271	1.2	1 U	1 U	1 U	4 U	1.2
	9-Dec-08	3	9	0.01 U	0.11	0.0107 U	153	2 U	384	2.2	1 UJ	1 U	1 U	4 U	2.2
	27-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	17-Mar-09	7	5.3	0.01 U	0.10	0.0107 U	179	2 U	296	1.1	1 U	1 U	1 U	4 U	1.1
	15-Oct-09	14	6.4	0.0072 U	0.11	#N/A	146	2 U	250	1 U	1 U	25 U	1 U	10 U	4 U
	14-Dec-09	16	26.8	0.0072 U	0.11	#N/A	171 J	2.2 J	220 J	45	1 U	25 U	1 U	10 U	45
	9-Feb-10	17	13.9 J	0.0072 U	0.08	#N/A	157	2 U	248	9.6	1 U	25 U	1 U	10 U	45
	31-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	45
6-May-10	20	60.6	0.0072 U	0.12	#N/A	130 J	2 U	244 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	45	
MW-10B	16-Oct-09	0	3.8	#N/A	#N/A	#N/A	121	2 U	239	1 U	1 U	25 U	1 U	10 U	4 U
	16-Dec-09	1	4.2	#N/A	#N/A	#N/A	123 J	2 U	268 J	1 U	1 U	25 U	1 U	10 U	4 U
	10-Feb-10	3	4.2 J	#N/A	#N/A	#N/A	87.5	2 U	253	1 U	1 U	25 U	1 U	10 U	10 U
	30-Mar-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	6-May-10	6	4.9	#N/A	#N/A	#N/A	89.5 J	2 U	244 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
MW-11B	16-Oct-09	0	3.4	#N/A	#N/A	#N/A	172	2 U	221	1 U	1 U	25 U	1 U	10 U	4 U
	16-Dec-09	1	7.4	#N/A	#N/A	#N/A	148 J	3.6	221 J	13	1 U	25 U	1 U	10 U	13
	10-Feb-10	3	11.7 J	#N/A	#N/A	#N/A	146	2.7	50.2	33	1 U	25 U	1 U	10 U	10 U
	30-Mar-10	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	6-May-10	6	14.1	#N/A	#N/A	#N/A	114 J	2.3 J	101 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U

**TABLE 3.3
LABORATORY RESULTS FOR GEOCHEMICAL PARAMETERS**

Well ID	Date	Months from Injection	Total Organic Carbon mg/L	Arsenic mg/L	Manganese mg/L	Selenium mg/L	Chloride mg/L	Bromide mg/L	Sulfate mg/L	Acetic Acid mg/L	Butyric Acid mg/L	Lactic Acid mg/L	Propionic Acid mg/L	Pyruvic Acid mg/L	Total Volatile Fatty Acids mg/l
MW-17A	12-Aug-08	0	2.4	#N/A	#N/A	#N/A	1250	2 U	168	1 U	1 U	1 U	1 U	4 U	4 U
	7-Oct-08	1	2.2	#N/A	#N/A	#N/A	1270 J	2 U	165	1 U	1 U	1 U	1 U	4 U	4 U
	10-Dec-08	3	2.2	#N/A	#N/A	#N/A	1070	2 U	161	1 U	1 UJ	1 U	1 U	4 U	4 U
	26-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6	2.3	#N/A	#N/A	#N/A	1220	2 U	170	1 U	1 U	1 U	1 U	4 U	4 U
	20-Oct-09	14	3.1	#N/A	#N/A	#N/A	1080 J	2 U	198 J	1 U	1 U	25 U	1 U	10 U	4 U
	11-Dec-09	15	3.1	#N/A	#N/A	#N/A	1060 J	2 U	217 J	77	1 U	25 U	1 U	10 U	4 U
	9-Feb-10	17	3.7 J	#N/A	#N/A	#N/A	962	2 U	194	1 U	1 U	25 U	1 U	10 U	4 U
	30-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4 U
	6-May-10	20	2.9	#N/A	#N/A	#N/A	729 J	8 U	196 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	4 U
MW-17B	12-Aug-08	0	3.06	#N/A	#N/A	#N/A	475	#N/A	211	1 U	#N/A	#N/A	#N/A	#N/A	#N/A
	8-Oct-08	1	55.7	0.0102 U	0.10	0.0107 U	561 J	2 U	169	146.4	1.4	1 U	1 U	4 U	147.8
	10-Dec-08	3	3	0.01 U	0.11	0.0107 U	802	2 U	180	1 U	1 UJ	1 U	1 U	4 U	4 U
	26-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	17-Mar-09	7	3.5	0.01 U	0.09	0.0107 U	631	2 U	275	1 U	1 U	1 U	1 U	4 U	4 U
	16-Oct-09	14	3	0.0072 U	0.12	#N/A	768 J	2 U	204 J	1 U	1 U	25 U	1 U	10 U	4 U
	11-Dec-09	15	264	0.0072 U	0.19	#N/A	171 J	12.2	18.3 J	200	1.6	25 U	130.0	10 U	331.6
	9-Feb-10	17	122 J	0.0072 U	0.19	#N/A	727	5.3 J	32.2	360	17	25 U	6.6	10 U	331.6
	30-Mar-10	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	331.6
	6-May-10	20	12.7	0.0072 U	0.0772	#N/A	883 J	2 U	49.7 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	331.6
MW-3A	12-Aug-08	0	2.6	#N/A	#N/A	#N/A	17.6	2 U	318	1 U	1 U	1 U	1 U	4 U	4 U
	6-Oct-08	1	2.3	#N/A	#N/A	#N/A	19.4 J	2 U	347	1 U	1 U	1 U	1 U	4 U	4 U
	8-Dec-08	3	4.9	#N/A	#N/A	#N/A	23.3	2 U	444	1 U	1 UJ	1 U	1 U	4 U	4 U
	26-Jan-09	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6	3.7	#N/A	#N/A	#N/A	27.3	2 U	334	1 U	1 U	1 U	1 U	4 U	4 U

ITALICIZED VALUES REPRESENTS DETECTION LIMIT WHEN THE PARAMETER WAS NOT DETECTED

INJECTIONS OF SUBSTRATE WERE COMPLETED IN JUNE-08 AND NOV-09

µg/L - MICROGRAMS PER LITER

mg/L - MILLIGRAMS PER LITER

J = ESTIMATED VALUE

U = BELOW DETECTION LIMITS

UJ = ESTIMATED NON-DETECT POSSIBLY BIASED LOW

E - EXCEEDANCE

#NA - Well was not sampled for this parameter

For MW-17A and B annual sampling in Arpil 2008 were used for baseline

**TABLE 3.4
RESULTS FOR FIELD LABORATORY ANALYTES**

Well ID	Date	Ferrous Iron mg/L	Manganese mg/L	Carbon Dioxide mg/L	Hydrogen Sulfide mg/L	Alkalinity (as CaCO ₃) mg/L
PMW-1	11-Aug-08	3.0	<0.1	140	0.0	400
	7-Oct-08	<0.1	<0.1	838	2.0	296
	9-Dec-08	0.2	<0.1	948	2.0	200
	27-Jan-09	NM	NM	126	NM	20
	16-Mar-09	0.2	<0.1	420	2.1	1108
	15-Oct-09	0.0	0.0	346	1.8	454
	15-Dec-09	0.0	0.0	528	1.1	508
	9-Feb-10	<0.1	0.2	196	3.0	770
	31-Mar-10	0.0	0.0	3892	>2.25	136
	7-May-10	0.0	0.0	548	5.0	187
PMW-2	11-Aug-08	1.0	<0.1	232	0.3	360
	7-Oct-08	<0.1	<0.1	618	2.0	534
	10-Dec-08	2.8	<0.1	157	0.7	40
	27-Jan-09	NM	NM	152	NM	30
	18-Mar-09	1.0	<0.1	480	1.2	504
	15-Oct-09	2.5	0.0	442	0.0	490
	10-Dec-09	0.8	0.0	516	1.5	364
	11-Feb-10	2.5	0.2	40	5.0	306
	30-Mar-10	4.0	0.0	3200	0.1	136
	7-May-10	4.3	0.0	794	0.0	153
PMW-3	13-Aug-08	1.0	<0.1	169	0.1	340
	8-Oct-08	1.0	<0.1	292	2.0	358
	8-Dec-08	<0.1	<0.1	260	2.0	380
	27-Jan-09	NM	NM	136	NM	30
	17-Mar-09	0.2	<0.1	232	2.4	560
	15-Oct-09	0.0	0.0	400	1.9	576
	14-Dec-09	0.0	0.0	704	1.1	598
	9-Feb-10	<0.1	0.1	197	5.0	770
	31-Mar-10	0.0	0.0	124	2.3	170
	7-May-10	0.0	0.0	528	2.0	170
PMW-4	13-Aug-08	1.6	<0.1	172	0.0	460
	7-Oct-08	1.8	<0.1	362	0.0	262
	10-Dec-08	1.2	<0.1	60	0.0	60
	27-Jan-09	NM	NM	145	NM	20
	18-Mar-09	0.5	<0.1	86	0.2	326
	15-Oct-09	1.2	0.0	240	0.0	326
	10-Dec-09	1.2	0.0	488	0.0	434
	11-Feb-10	0.2	<0.1	162	<0.1	187
	31-Mar-10	1.2	0.0	3390	0.0	119
	10-May-10	1.0	0.0	594	0.0	153
PMW-5	20-Oct-09	0.2	0.0	294	0.0	356
	15-Dec-09	0.4	0.0	1198	0.65	1044
	10-Feb-10	<0.1	0.4	347	5.0	1155
	31-Mar-10	0.0	0.0	1648	2.0	170
	7-May-10	0.1	0.7	526	2.5	255
PMW-6	19-Oct-09	1.2	0.0	284	0.0	176
	15-Dec-09	0.2	0.0	760	0.60	650
	10-Feb-10	0.2	0.7	290	2.0	770
	30-Mar-10	0.1	0.0	1786	0.5	136
	7-May-10	0.0	0.8	562	5.0	255
PMW-7	19-Oct-09	0.8	0.0	348	0.0	348
	16-Dec-09	0.4	0.0	596	0.75	562
	10-Feb-10	0.2	0.2	215	2.0	770
	1-Apr-10	0.0	0.4	988	2.0	221
	7-May-10	0.0	0.1	542	2.0	204

**TABLE 3.4
RESULTS FOR FIELD LABORATORY ANALYTES**

Well ID	Date	Ferrous Iron mg/L	Manganese mg/L	Carbon Dioxide mg/L	Hydrogen Sulfide mg/L	Alkalinity (as CaCO ₃) mg/L
PMW-8	12-Aug-08	0.9	<0.1	468	0.0	420
	6-Oct-08	0.1	<0.1	892	2.0	255
	8-Dec-08	<0.1	<0.1	813	2.0	350
	27-Jan-09	NM	NM	193	NM	15
	18-Mar-09	0.6	<0.1	502	1.1	352
	19-Oct-09	0.4	0.0	170	0.0	400
	15-Dec-09	0.4	0.0	340	1.5	248
	9-Feb-10	0.3	<0.1	300	0.1	180
	30-Mar-10	0.2	0.0	2154	>2.25	136
	7-May-10	0.0	0.0	794	1.8	119
PMW-9	19-Oct-09	1.0	0.0	302	0.0	316
	16-Dec-09	0.4	0.0	448	1.75	288
	10-Feb-10	0.2	<0.1	96	0.7	770
	30-Mar-10	0.2	0.0	3032	>2.25	153
	7-May-10	0.0	0.0	582	0.3	170
INJ-01	13-Aug-08	11.3	<0.1	156	0.1	440
	8-Oct-08	<0.1	<0.1	168	2.0	354
	9-Dec-08	<0.1	<0.1	140	2.0	420
	27-Jan-09	NM	NM	299	NM	25
	17-Mar-09	0.0	<0.1	145	1.5	324
	15-Oct-09	0.2	0.0	352	1.5	414
	14-Dec-09	0.2	0.0	676	1.2	436
	11-Feb-10	<0.1	<0.1	212	5.0	323
	1-Apr-10	0.1	0.1	290	0.5	170
	10-May-10	0.0	0.5	562	5.0	255
INJ-02	12-Aug-08	1.6	<0.1	178	0.1	360
	7-Oct-08	<0.1	<0.1	714	2.0	204
	9-Dec-08	<0.1	<0.1	1298	2.0	240
	27-Jan-09	NM	NM	192	NM	20
	18-Mar-09	0.2	<0.1	176	1.8	374
	15-Oct-09	0.0	0.0	378	1.6	380
	10-Dec-09	0.2	0.0	556	0.8	916
	11-Feb-10	0.2	<0.1	200	5.0	289
	1-Apr-10	#N/A	<0.1	2156	2.1	170
	10-May-10	0.0	0.3	554	2.0	170
INJ-03	20-Oct-09	0.4	0.0	422	1.75	410
	15-Dec-09	0.2	0.0	976	0.65	678
	9-Feb-10	2.4	0.2	162	1.5	1925
	31-Mar-10	0.1	0.2	609	2.0	204
	10-May-10	1.2	0.3	584	5.0	187
INJ-04	20-Oct-09	1.0	0.0	326	0.0	446
	10-Dec-09	0.2	0.0	674	0.50	460
	9-Feb-10	1.0	0.2	146	2.0	1155
	1-Apr-10	1.0	0.0	599	2.0	221
	10-May-10	0.8	0.3	580	2.0	187
MW-7A	12-Aug-08	3.4	<0.1	167	0.0	460
	8-Oct-08	0.8	0.1	464	2.0	424
	9-Dec-08	0.2	<0.1	1005	2.0	400
	27-Jan-09	NM	NM	171	NM	20
	17-Mar-09	0.1	<0.1	266	1.5	308
	15-Oct-09	0.4	0.0	432	1.7	538
	14-Dec-09	0.2	0.0	836	1.3	770
	9-Feb-10	0.2	<0.1	149	0.5	770
	1-Apr-10	0.2	<0.1	3572	2.3	153
	6-May-10	0.0	0.0	394	>2.25	153

TABLE 3.4
RESULTS FOR FIELD LABORATORY ANALYTES

Well ID	Date	Ferrous Iron mg/L	Manganese mg/L	Carbon Dioxide mg/L	Hydrogen Sulfide mg/L	Alkalinity (as CaCO ₃) mg/L
MW-7B	12-Aug-08	NM	NM	NM	NM	NM
	7-Oct-08	<0.1	<0.1	652	0.7	280
	9-Dec-08	<0.1	<0.1	60	0.0	400
	27-Jan-09	NM	NM	162	NM	25
	17-Mar-09	<0.1	<0.1	200	1.1	360
	15-Oct-09	0.0	0.0	370	1.9	298
	14-Dec-09	0.0	0.0	588	1.0	228
	9-Feb-10	<0.1	<0.1	118	5.0	385
	31-Mar-10	0.0	<0.1	1234	2.0	204
	6-May-10	0.2	0.0	408	2.3	92
MW-10B	16-Oct-09	1.0	0.0	926	0.0	414
	16-Dec-09	0.8	0.0	430	0.5	296
	10-Feb-10	0.5	<0.1	99	0.1	385
	30-Mar-10	0.4	0.1	180	0.1	136
	6-May-10	1.0	0.0	436	0.2	153
MW-11B	16-Oct-09	0.0	0.0	238	0.5	304
	16-Dec-09	0.0	0.0	514	1.65	376
	10-Feb-10	0.2	0.2	140	2.0	770
	30-Mar-10	<0.1	0.0	180	5.0	170
	6-May-10	0.0	0.0	232	5.0	255
MW-17A	12-Aug-08	4.1	<0.1	154	0.0	340
	7-Oct-08	1.3	<0.1	298	0.0	88
	10-Dec-08	3.8	<0.1	197	0.1	80
	26-Jan-09	NM	NM	43	NM	20
	16-Mar-09	0.6	<0.1	324	1.1	385
	20-Oct-09	2.0	0.0	356	0.0	360
	11-Dec-09	1.5	0.0	306	0.0	368
	9-Feb-10	2.2	0.1	220	<0.1	<350
	30-Mar-10	2.0	0.0	1632	0.0	170
	6-May-10	2.0	0.0	530	0.1	258
MW-17B	12-Aug-08	NM	NM	NM	NM	NM
	8-Oct-08	0.2	<0.1	422	1.0	304
	10-Dec-08	0.4	<0.1	455	2.0	360
	26-Jan-09	NM	NM	68	NM	15
	17-Mar-09	0.3	<0.1	224	0.2	274
	16-Oct-09	1.4	0.0	318	0.0	268
	11-Dec-09	1.2	0.0	664	0.0	252
	9-Feb-10	0.1	0.1	60	5.0	670
	30-Mar-10	<0.1	0.0	1684	2.0	204
	6-May-10	0.0	0.0	494	2.0	289
MW-3A	12-Aug-08	0.8	<0.1	237	0.0	600
	6-Oct-08	<0.1	<0.1	602	0.0	367
	8-Dec-08	<0.1	<0.1	464	0.1	400
	26-Jan-09	NM	NM	44	NM	30
	16-Mar-09	<0.1	<0.1	360	1.1	400

NOTE: Italicized concentrations were non-detect, listed at the detection limit

#NA = Not Applicable, typically due to no sample being taken.

NM = not measured

^a/CaCO₃ - calcium carbonate, refers to type of alkalinity test.

**TABLE 3.5
RESULTS OF LOW FLOW SAMPLING FIELD PARAMETERS**

Well ID	Date	Months from Injection	Specific Conductivity mS/cm	Oxidation Reduction Potential mv	pH SU
PMW-1	11-Aug-08	0.0	1.41	-150	7.17
	7-Oct-08	1.1	1.79	-222	5.84
	9-Dec-08	3.2	0.73	-329	7.13
	27-Jan-09	4.9	1.58	-339	7.20
	16-Mar-09	6.5	0.94	-368	6.65
	15-Oct-09	13.6	1.51	-352	6.93
	15-Dec-09	15.6	0.91	-358	7.80
	9-Feb-10	17.5	0.14	-375	6.81
	31-Mar-10	19.1	1.49	-353	7.10
7-May-10	20.4	1.26	-361	6.66	
PMW-2	11-Aug-08	0.0	1.30	-164	6.67
	7-Oct-08	1.1	2.36	-347	5.65
	10-Dec-08	3.3	1.17	-188	6.99
	27-Jan-09	4.9	1.41	-335	6.60
	18-Mar-09	6.5	1.35	-303	6.12
	15-Oct-09	13.6	1.77	-128	6.96
	10-Dec-09	15.4	1.11	-272	8.22
	11-Feb-10	17.5	1.65	-312	6.51
	30-Mar-10	19.1	1.75	-225	7.01
7-May-10	20.4	1.75	-233	6.71	
PMW-3	13-Aug-08	0.0	1.35	-184	6.95
	8-Oct-08	1.2	2.36	-247	6.04
	8-Dec-08	3.2	0.74	-309	7.03
	27-Jan-09	4.9	1.30	-331	6.46
	17-Mar-09	6.5	0.93	-345	6.40
	15-Oct-09	13.6	1.67	-349	6.98
	14-Dec-09	15.6	1.09	-351	7.93
	9-Feb-10	17.5	0.15	-374	6.71
	31-Mar-10	19.1	1.64	-371	6.89
7-May-10	20.4	1.59	-346	6.53	
PMW-4	13-Aug-08	0.0	0.91	-11	6.61
	7-Oct-08	1.1	2.16	-194	6.05
	10-Dec-08	3.3	0.72	-70	7.20
	27-Jan-09	4.9	1.53	-96	7.05
	18-Mar-09	6.5	1.24	-132	6.15
	15-Oct-09	13.6	1.53	-131	6.80
	10-Dec-09	15.4	0.96	-199	8.13
	11-Feb-10	17.5	0.16	-162	6.69
	31-Mar-10	19.1	1.60	-136	6.52
10-May-10	20.5	1.60	-99	6.67	
PMW-5	20-Oct-09	0.0	1.8	-278	7.26
	15-Dec-09	1.1	3.84	-342	7.06
	10-Feb-10	3.0	0.2	-344	6.09
	31-Mar-10	4.6	3.2	-300	6.02
	7-May-10	5.8	3.2	-315	5.82
PMW-6	19-Oct-09	0.0	2.06	-263	7.52
	15-Dec-09	1.1	2.76	-352	7.36
	10-Feb-10	3.0	2.4	-346	6.33
	30-Mar-10	4.6	2.5	-344	6.56
	7-May-10	5.8	2.5	-349	6.54
PMW-7	19-Oct-09	0.0	1.71	-262	7.19
	16-Dec-09	1.1	1.94	-355	7.33
	10-Feb-10	3.0	1.9	-361	6.41
	1-Apr-10	4.6	2.1	-356	6.09
	7-May-10	5.8	2.6	-345	6.76

**TABLE 3.5
RESULTS OF LOW FLOW SAMPLING FIELD PARAMETERS**

Well ID	Date	Months from Injection	Specific Conductivity mS/cm	Oxidation Reduction Potential mv	pH SU
PMW-8	12-Aug-08	0.0	1.46	-195	7.14
	6-Oct-08	1.1	1.72	-311	6.54
	8-Dec-08	3.2	1.17	-303	7.20
	27-Jan-09	4.9	1.60	-302	7.28
	18-Mar-09	6.5	1.60	-281	6.49
	19-Oct-09	13.7	1.58	-245	6.88
	15-Dec-09	15.6	1.31	-307	7.99
	9-Feb-10	17.5	0.16	-267	6.86
	30-Mar-10	19.1	1.72	-315	7.05
7-May-10	20.4	1.59	-302	7.25	
PMW-9	19-Oct-09	0.0	2.49	-189	7.02
	16-Dec-09	1.1	1.33	-348	8.05
	10-Feb-10	3.0	0.1	-312	6.84
	30-Mar-10	4.6	1.8	-335	7.15
	7-May-10	5.8	1.6	-310	7.06
INJ-01	13-Aug-08	0.0	1.35	-126	7.19
	8-Oct-08	1.2	2.24	-334	6.05
	9-Dec-08	3.2	1.03	-333	6.95
	27-Jan-09	4.9	1.50	-351	7.31
	17-Mar-09	6.5	0.95	-349	6.42
	15-Oct-09	13.6	1.47	-389	6.89
	14-Dec-09	15.6	1.16	-351	7.66
	11-Feb-10	17.5	0.16	-365	6.89
	1-Apr-10	19.2	1.54	-359	6.54
10-May-10	20.5	1.55	-359	7.19	
INJ-02	12-Aug-08	0.0	1.40	-153	7.20
	7-Oct-08	1.1	1.86	-252	6.09
	9-Dec-08	3.2	1.12	-340	7.05
	27-Jan-09	4.9	1.58	-354	7.28
	18-Mar-09	6.5	1.27	-361	6.19
	15-Oct-09	13.6	1.63	-368	6.83
	10-Dec-09	15.4	1.14	-341	7.91
	11-Feb-10	17.5	1.42	-371	6.73
	1-Apr-10	19.2	1.62	-367	6.37
10-May-10	20.5	1.56	-365	7.52	
INJ-03	20-Oct-09	0.0	1.69	-328	6.91
	15-Dec-09	1.1	2.52	-344	7.1
	9-Feb-10	2.9	3.7	-330	6.01
	31-Mar-10	4.6	3.3	-308	6.09
	10-May-10	5.9	3.6	-311	6.27
INJ-04	20-Oct-09	0.0	1.67	-214	6.99
	10-Dec-09	0.9	2.21	-334	6.92
	9-Feb-10	2.9	2.6	-351	6.28
	1-Apr-10	4.6	3.1	-257	6.12
	10-May-10	5.9	2.9	-237	6.50
MW-7A	12-Aug-08	0.0	1.23	-105	7.06
	8-Oct-08	1.2	2.04	-307	5.77
	9-Dec-08	3.2	0.73	-244	7.01
	27-Jan-09	4.9	1.54	-373	7.15
	17-Mar-09	6.5	1.39	-390	6.28
	15-Oct-09	13.6	1.55	-340	6.89
	14-Dec-09	15.6	1.20	-343	7.69
	9-Feb-10	17.5	0.14	-355	6.81
	1-Apr-10	19.2	1.48	-340	6.56
6-May-10	20.3	1.57	-340	7.24	

**TABLE 3.5
RESULTS OF LOW FLOW SAMPLING FIELD PARAMETERS**

Well ID	Date	Months from Injection	Specific Conductivity mS/cm	Oxidation Reduction Potential mv	pH SU
MW-7B	12-Aug-08	0.0	1.23	-105	7.06
	7-Oct-08	1.1	1.94	-307	6.75
	9-Dec-08	3.2	1.26	-367	7.09
	27-Jan-09	4.9	1.68	-348	7.29
	17-Mar-09	6.5	1.54	-336	6.40
	15-Oct-09	13.6	1.77	-388	6.84
	14-Dec-09	15.6	1.25	-348	7.90
	9-Feb-10	17.5	0.17	-353	6.87
	31-Mar-10	19.1	1.39	-348	6.55
6-May-10	20.3	1.87	-348	7.42	
MW-10B	16-Oct-09	0.0	1.83	-113	6.91
	16-Dec-09	1.1	1.47	-105	6.45
	10-Feb-10	3.0	1.5	-149	6.63
	30-Mar-10	4.6	1.7	-146	6.48
	6-May-10	5.8	1.8	-152	7.25
MW-11B	16-Oct-09	0.0	1.73	-226	6.92
	16-Dec-09	1.1	1.28	-351	7.62
	10-Feb-10	3.0	0.1	-372	6.76
	30-Mar-10	4.6	1.7	-367	6.75
	6-May-10	5.8	1.8	-364	7.08
MW-17A	12-Aug-08	0.0	4.67	-95	7.05
	7-Oct-08	1.1	7.46	-129	5.84
	10-Dec-08	3.3	3.48	-117	7.00
	26-Jan-09	4.8	4.38	-57	6.82
	16-Mar-09	6.5	3.89	-71	6.48
	20-Oct-09	13.7	5.24	-115	6.88
	11-Dec-09	15.5	4.54	-247	8.53
	9-Feb-10	17.5	4.19	-269	6.91
	30-Mar-10	19.1	3.97	-155	6.85
6-May-10	20.3	43.00	-94	6.76	
MW-17B	12-Aug-08	0.0	#NA	#NA	#NA
	8-Oct-08	1.2	3.98	-350	5.99
	10-Dec-08	3.3	1.88	-272	7.06
	26-Jan-09	4.8	2.95	-308	7.09
	17-Mar-09	6.5	3.05	-317	6.33
	16-Oct-09	13.6	4.04	-175	7.05
	11-Dec-09	15.5	1.83	-337	7.20
	9-Feb-10	17.5	4.01	-367	6.51
	30-Mar-10	19.1	4.31	-330	6.58
6-May-10	20.3	4.01	-310	6.78	
MW-3A	12-Aug-08	0.0	1.41	120	6.70
	6-Oct-08	1.1	1.86	97	6.11
	8-Dec-08	3.2	1.29	128	7.23
	26-Jan-09	4.8	1.52	108	6.31
	16-Mar-09	6.5	1.75	116	6.66

NOTE: Italicized concentrations were non-detect, listed at the detection limit

#NA = Not Applicable, typically due to no sample being taken.

mS/cm - millisiemens / cm

mV - Millivolts

SU - Standard Units

**TABLE 3.6
MICROBIAL CENSUS SURVEY RESULTS**

Well ID	Date	Months from Injection	DHC cells/mL	DHB cells/mL	BVC R-Dase cells/mL	TCE R-Dase cells/mL	VCR R-Dase cells/mL
INJ-01	13-Aug-08	0	2.05E+00	0.971 J	0.408 J	0.5 U	4.71E+00
	8-Oct-08	1.2	1.18E+02	2.69E+03	8.22E+00	7.75E-01	1.02E+02
	9-Dec-08	3.2	#N/A	#N/A	#N/A	#N/A	#N/A
	27-Jan-09	4.9	#N/A	#N/A	#N/A	#N/A	#N/A
	17-Mar-09	6.5	4.88E+03	6.54E+01	3.62E+03	3.65E+03	4.96E+03
	15-Oct-09	13.6	1.51E+04	3.73E+04	1.19E+03	7.90E+02	6.84E+03
	14-Dec-09	15.6	2.70E+04	7.37E+03	1.08E+04	1.06E+03	9.71E+03
	11-Feb-10	17.5	#N/A	#N/A	#N/A	#N/A	#N/A
	1-Apr-10	19.2	#N/A	#N/A	#N/A	#N/A	#N/A
	10-May-10	20.5	2.58E+04	2.28E+01	4.33E+03	6.20E+02	1.07E+04
	#N/A	0	#N/A	#N/A	#N/A	#N/A	#N/A
INJ-03	#N/A	0	#N/A	#N/A	#N/A	#N/A	#N/A
	6-Oct-08	1.1	#N/A	#N/A	#N/A	#N/A	#N/A
	8-Dec-08	3.2	#N/A	#N/A	#N/A	#N/A	#N/A
	26-Jan-09	4.8	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6.5	#N/A	#N/A	#N/A	#N/A	#N/A
	20-Oct-09	13.7	3.90E+03	1.40E+04	1.17E+02	1.09E+02	4.30E+03
	15-Dec-09	15.6	2.65E+02	7.98E+04	8.40E+00	3.50E+00	4.71E+02
	9-Feb-10	17.5	#N/A	#N/A	#N/A	#N/A	#N/A
	31-Mar-10	19.1	#N/A	#N/A	#N/A	#N/A	#N/A
	10-May-10	20.5	1.63E+03	2.53E+01	0.3 <	5.74E+02	1.21E+03
	#N/A	0	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-3	13-Aug-08	0.0	6.27E+00	2.25E+02	8.95E-01	0.202 J	3.79E+00
	6-Oct-08	1.1	3.90E+02	3.77E+03	1.60E+01	9.46E+00	1.80E+02
	8-Dec-08	3.2	#N/A	#N/A	#N/A	#N/A	#N/A
	26-Jan-09	4.8	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6.5	2.75E+04	4.01E+01	2.75E+04	5.14E+03	2.98E+04
	15-Oct-09	13.6	2.81E+04	2.13E+04	5.21E+03	2.57E+03	1.52E+04
	14-Dec-09	15.6	6.82E+04	4.20E+04	4.58E+03	2.72E+03	4.05E+04
	9-Feb-10	17.5	#N/A	#N/A	#N/A	#N/A	#N/A
	31-Mar-10	19.1	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	20.4	4.81E+04	0.5 <	1.29E+04	5.99E+03	2.08E+04
	#N/A	0.0	#N/A	#N/A	#N/A	#N/A	#N/A
PMW-5	#N/A	0.0	#N/A	#N/A	#N/A	#N/A	#N/A
	6-Oct-08	1.1	#N/A	#N/A	#N/A	#N/A	#N/A
	8-Dec-08	3.2	#N/A	#N/A	#N/A	#N/A	#N/A
	26-Jan-09	4.8	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6.5	#N/A	#N/A	#N/A	#N/A	#N/A
	20-Oct-09	13.7	7.86E+03	2.01E+04	3.13E+02	3.58E+02	7.22E+03
	10-Dec-09	15.4	2.98E+03	4.51E+03	7.43E+01	1.96E+01	3.67E+03
	10-Feb-10	17.5	#N/A	#N/A	#N/A	#N/A	#N/A
	30-Mar-10	19.1	#N/A	#N/A	#N/A	#N/A	#N/A
	7-May-10	20.4	9.52E+03	2.60E+00	3.90E+00	3.05E+02	8.34E+03
	#N/A	0.0	#N/A	#N/A	#N/A	#N/A	#N/A
MW-7A	12-Aug-08	0.0	2.52E+01	6.19E+00	1.79E+01	0.5 U	4.97E+01
	6-Oct-08	1.1	9.12E+01	7.35E+03	1.20E+01	0.105 J	2.47E+02
	8-Dec-08	3.2	#N/A	#N/A	#N/A	#N/A	#N/A
	26-Jan-09	4.8	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6.5	4.04E+03	3.55E+01	1.49E+04	1.51E+02	3.74E+03
	15-Oct-09	13.6	3.41E+04	6.80E+04	6.32E+03	7.91E+02	2.04E+04
	10-Dec-09	15.4	4.26E+03	9.03E+04	1.43E+03	2.42E+01	4.76E+03
	9-Feb-10	17.5	#N/A	#N/A	#N/A	#N/A	#N/A
	30-Mar-10	19.1	#N/A	#N/A	#N/A	#N/A	#N/A
	6-May-10	20.3	744	2010	53.4	12.4	571
	#N/A	0.0	#N/A	#N/A	#N/A	#N/A	#N/A
MW-17B	12-Aug-08	0.0	#N/A	#N/A	#N/A	#N/A	#N/A
	6-Oct-08	1.1	7.13E+03	4.02E+03	6.63E+02	4.38E+01	7.46E+03
	8-Dec-08	3.2	#N/A	#N/A	#N/A	#N/A	#N/A
	26-Jan-09	4.8	#N/A	#N/A	#N/A	#N/A	#N/A
	16-Mar-09	6.5	6.06E+03	2.05E+01	3.77E+02	2.67E+03	1.21E+04
	16-Oct-09	13.6	1.44E+03	1.95E+04	4.19E+01	6.51E+01	1.27E+03
	10-Dec-09	15.4	9.70E+02	3.88E+04	4.90E+01	1.20E+00	4.95E+02
	9-Feb-10	17.5	#N/A	#N/A	#N/A	#N/A	#N/A
	30-Mar-10	19.1	#N/A	#N/A	#N/A	#N/A	#N/A
	6-May-10	20.3	1.51E+04	4.88E+02	9.40E+01	7.16E+02	1.33E+04
	#N/A	0.0	#N/A	#N/A	#N/A	#N/A	#N/A

NOTE: Italicized concentrations were non-detect, listed at the detection limit
#NA = Not Applicable, typically due to no sample being taken.

SECTION 4 CONCLUSIONS AND PATH FORWARD

More than 10 years of groundwater monitoring has shown that reductive dechlorination of chlorinated ethenes has occurred at the Site under natural conditions, both in the overburden and bedrock groundwater. The rate of degradation, however, was less than optimal. The purpose of the pilot tests was to attempt to enhance the rate of the ongoing degradation process, and determine if bioremediation could be used increase the rate of degradation of chlorinated ethenes in the overburden and bedrock groundwater.

The results of the pilot tests suggest that enhanced *in situ* bioremediation of chlorinated ethenes appears to be a viable treatment option for groundwater. The data generated during two years of pilot testing support the following conclusions:

- Within the overburden injection area, there was a rapid transformation of TCE to degradation products at all injection and performance monitoring wells that were treated with substrate. TCE is absent in most of the bedrock groundwater.
- DCE decreased at all performance monitoring wells within the radius of influence (overburden and bedrock). Increases of VC, where present, were relatively less significant with respect to the overall Site conditions.
- Generation of ethene indicates that the biodegradation pathway is complete, and that DCE or VC can be effectively degraded, in both the overburden and bedrock systems.
- The depth to groundwater, hydraulic conductivity, and connectivity of overburden and bedrock are suitable for distribution of substrate.
- The groundwater velocity in the overburden is relatively high; therefore TOC is readily depleted. However, an increased dosage of substrate and use of an ionic surfactant appeared to increase the longevity.
- Groundwater velocity in the bedrock was sufficient so that downgradient wells showed evidence of degradation from injections in up-gradient areas.
- The addition of a bioaugmentation culture appeared to enhance the populations of dechlorinating microbes.

Path Forward

With NYSDEC concurrence, the following steps lay out a path forward:

- Continue to monitor the pilot test and downgradient wells on a semi-annual schedule. This information will be used to understand the bioremediation progress and substrate longevity. Continue to monitor other Site wells annually.
- Continue monitoring of groundwater in the bedrock, with no additional injections. This is justified by the following:

- Low concentrations in bedrock;
- Increased degradation rates from pilot test injections;
- High groundwater velocity in bedrock. Results from MW-11B and MW-15 suggest that the pilot test substrate injections in bedrock have reduced the concentration at these downgradient wells.
- Good hydraulic connection between overburden and bedrock. It appears that injections in the overburden can maintain the observed decrease in downgradient bedrock groundwater;
- Develop a work plan for additional groundwater monitoring and overburden substrate injections.

SECTION 5

SPRING 2010 ANNUAL GROUNDWATER MONITORING EVENT

This section summarizes the Spring 2010 annual groundwater monitoring activities completed at the Former Carborundum Company Hyde Park Facility (Site) in the Town of Niagara, New York. Groundwater sampling was completed between May 5 and May 14, 2010. Results from the Spring 2010 sampling event conducted in May 2010 are provided, with a comparison of the recent data against historical results. A five-year review report summarizing the past five years of monitoring will be submitted during the fourth quarter of 2010.

The work was conducted in accordance with the NYSDEC-approved groundwater monitoring work plan (DE&S, 2000a), correspondence from NYSDEC dated September 28, 2005, the work plan amendment dated April 5, 2010, and NYSDEC's approval letter dated April 23, 2010.

In September 2008 and November 2009, *in situ* bioremediation pilot tests were conducted, including the addition of a vegetable-based substrate into both the overburden and bedrock groundwater systems. The results of this testing are discussed in the pilot test report, to which this annual report summary is an appendix. Where applicable, the pilot test report is referenced below.

5.1 WATER LEVEL MONITORING

A summary of the groundwater elevations for May 5, 2010 is provided in Table 3.1. Table 3.1 also includes well location and top of casing and ground surface elevations for the monitoring wells.

Groundwater in the overburden monitoring wells was measured at depths between 4.0 and 10.3 feet below ground surface (bgs). Groundwater contour maps were developed based on the May 5, 2010 water levels (Figure 3.2A). The overburden groundwater flow direction is to the west/southwest, towards Hyde Park Boulevard and Rhode Island Avenue. The direction and gradient are consistent with historical data.

Groundwater in the bedrock monitoring wells was measured at depths between 2.85 and 10.7 feet bgs. A bedrock groundwater potentiometric surface contour map was developed based on the May 5, 2010 water levels (Figure 3.2B). Consistent with historical observations of groundwater flow, the bedrock groundwater flow direction is generally southwesterly towards Rhode Island Avenue and Hyde Park Boulevard. The direction and gradient are consistent with historical data.

5.2 GROUNDWATER SAMPLING AND ANALYSIS

Groundwater samples were collected from selected monitoring wells in accordance with the work plan amendment dated April 5, 2010, and NYSDEC's approval letter dated April 23, 2010. All wells were analyzed for selected chlorinated volatile organic compounds (VOCs) in accordance with the April 2010 work plan amendment, and selected wells were analyzed for various parameters for use in evaluating natural attenuation. The locations of the monitoring wells are shown on Figure 1.2. Quality assurance/quality control (QA/QC) samples including field duplicates, matrix spike/matrix spike duplicate samples and trip blanks were collected in accordance with the work plan. A copy of the groundwater sampling logs is provided in Appendix D.

During purging, groundwater was monitored for pH, specific conductivity, turbidity, DO, temperature, TDS, and ORP. An aliquot of the groundwater sample was tested in the field for the presence of ferrous iron in selected samples.

Following collection, the samples were packed in ice and shipped via overnight delivery to an approved laboratory in accordance with chain-of-custody procedures. Groundwater sample analyses were performed by Lancaster Laboratory in Lancaster, Pennsylvania.

Purge water and decontamination water were contained and staged in 55-gallon drums for disposal. Following receipt of sample results, the water was disposed of in the sanitary sewer under a permit with the Niagara Falls Water Board.

5.3 GROUNDWATER SAMPLING RESULTS

5.3.1 VOC Results

Groundwater samples from 24 groundwater monitoring wells (10 overburden, 14 bedrock) were collected and analyzed for the presence of select VOCs.

For reporting purposes, the analytical results have been compared to the Class GA Groundwater Standards and Guidance provided in the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Groundwater Quality Standards and Guidance Values and Groundwater Effluent Limitations (NYSDEC, 1998). Results are summarized in Table 5.1.

Overburden Results: Figure 5.1 shows a summary of the overburden well COC analytical results from the May 2010 sampling event, and from several historical events. The COC results for the overburden groundwater samples were generally consistent with previous rounds of monitoring and long-term trends. COC concentrations in MW-7A (within the pilot test area) and MW-12A (downgradient of the pilot test area near Hyde Park Boulevard) have declined substantially since implementation of the pilot tests in 2008 and 2009. COC concentrations in MW-5A, also downgradient of the pilot test area, increased in 2010, but had concentrations similar to those observed in 2006.

COCs with concentrations exceeding the Class GA criteria were detected in all 10 of the overburden well samples. TCE was sporadically detected in the overburden (3 of 10 wells) at concentrations that range between 15 and 94 µg/L.

Bedrock Results: Figure 5.2 shows a summary of the bedrock well COC analytical results from the May 2010 sampling and several historical sampling events. The COC results for the 14 bedrock groundwater samples were generally consistent with historical concentrations and recent decreasing COC concentration trends. In particular, concentrations in MW-17B (in the bedrock pilot test area), and MW-10B, 11B, 14B, and 15 (downgradient of pilot test area) have decreased substantially after implementation of the pilot testing in 2008 and 2009. Concentrations in MW-6 (adjacent to the overburden pilot test area), and MW-16B (upgradient of the bedrock pilot test area), also showed recent decreases.

COC concentrations exceeding the Class GA criteria were detected in all 14 of the bedrock groundwater samples. TCE was non-detect in all but well MW-5B (1.1 µg/L).

5.3.2 Attenuation Monitoring Results

As part of the ongoing groundwater monitoring program, natural attenuation parameters are sampled during each monitoring event. The results for 2010 were generally consistent with previous monitoring events (Table A.2), with the exception of notable changes of methane in wells MW-5A, MW-7A, MW-17A, MW-10B, and MW-14B; ethene in wells MW-5A and MW-14B; and BOD, COD, sulfate, and sulfide in well MW-14B. Site-wide long-term changes in COC concentrations suggest that natural attenuation is an ongoing, active process. Pilot tests conducted at the Site during 2008 and 2009, however, have enhanced the rate of natural attenuation in and around the pilot test areas. More detailed information regarding the attenuation monitoring and the influence of the pilot tests is presented in Section 3.5 of the pilot test report.

5.4 DATA VALIDATION

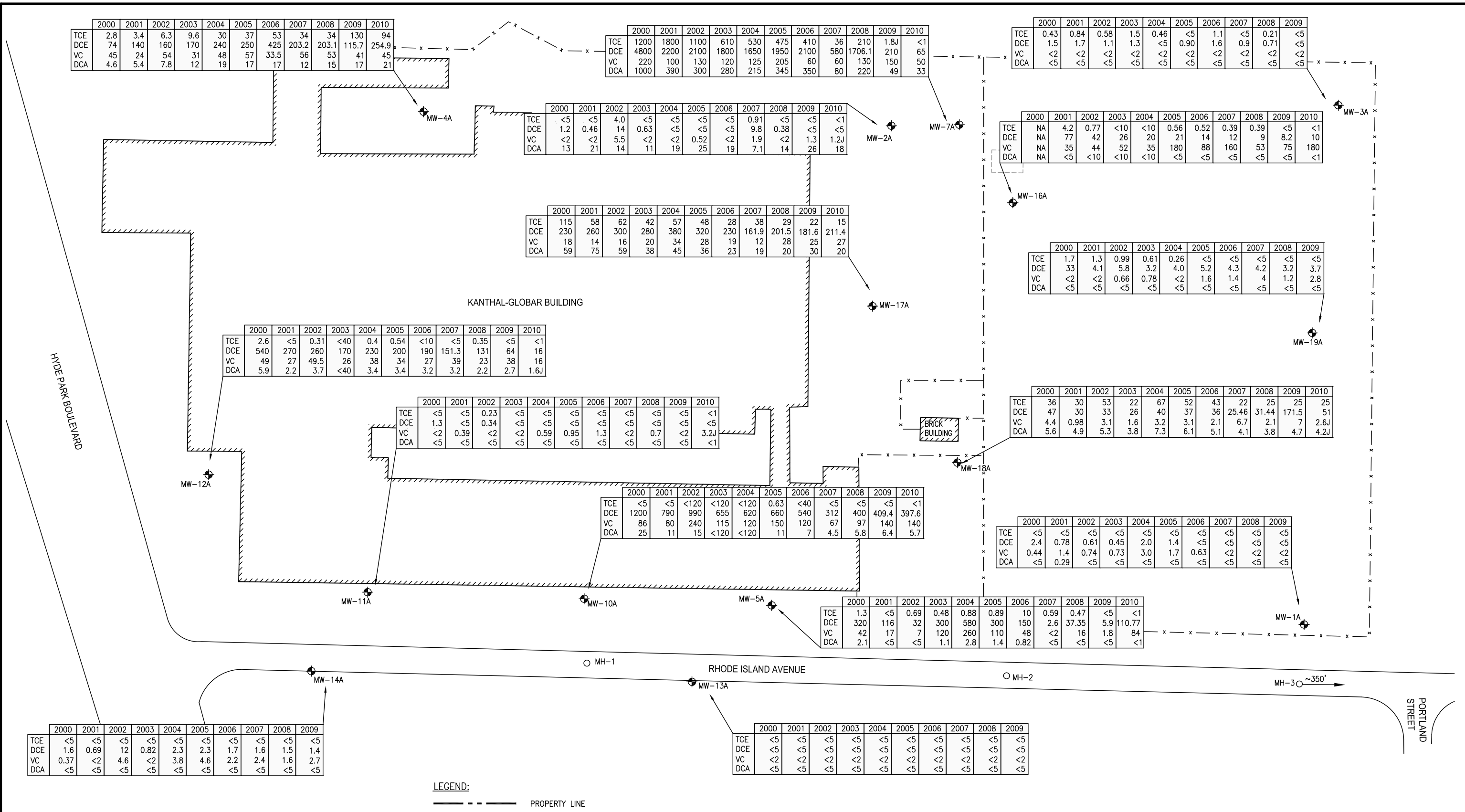
Groundwater samples were collected from the Hyde Park Site in the Town of Niagara, New York from May 6, 2009 through May 14, 2010. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan;
- NYSDEC Analytical Services Protocol (ASP); and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratory for this project was Lancaster Laboratories. This laboratory is approved to conduct project analyses through the New York Department of Health (NYDOH) Environmental Laboratory Approval Program (ELAP).

The data submitted by the laboratory have been reviewed and validated. The analytical data were found to be acceptable in terms of deliverable completeness, accuracy, precision, representativeness, completeness and comparability. Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review.

A copy of the data usability summary report (DUSR) for groundwater samples is included in Appendix F.



LEGEND:

- — — — — PROPERTY LINE
- x - x - x - FENCE
- ⊕ MW-5A MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
- ⊕ MW-5B MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
- MH-1 MANHOLE (SANITARY SEWER SAMPLE LOCATION)

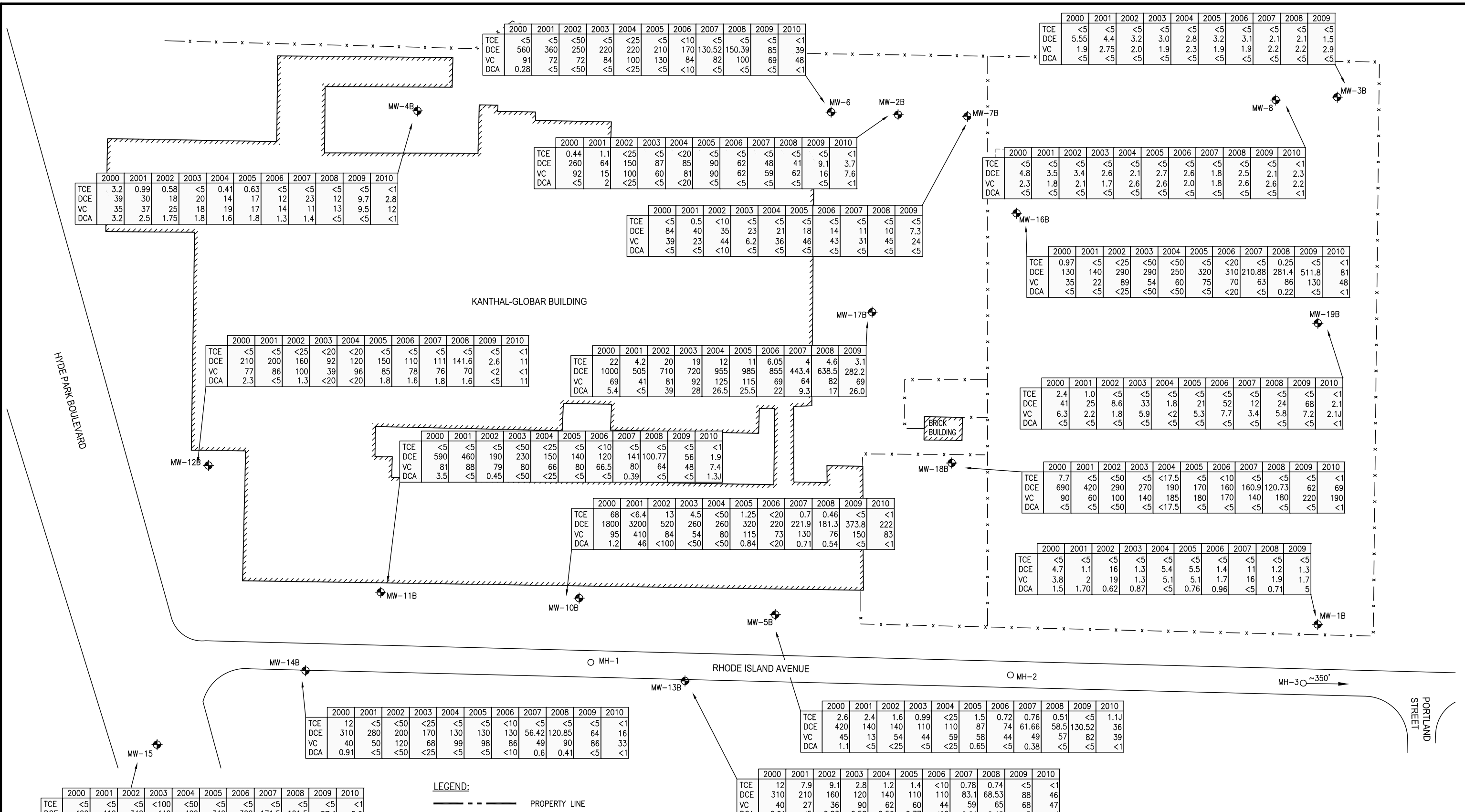
CONCENTRATIONS IN ug/L (ppb)

	SAMPLE DATE	
TCE		TRICHLOROETHENE
DCE		CIS- AND TRANS-1,2-DICHLOROETHENE
VC		VINYL CHLORIDE
DCA		1,1-DICHLOROETHANE

FIGURE 5.1
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NEW YORK
**COC CONCENTRATIONS IN OVERBURDEN
 GROUNDWATER (2000-2010)**

PARSONS
 40 LA RIVIERE DRIVE, SUITE 350, BUFFALO, NEW YORK 14202 PHONE: 716-541-0730

SOURCE: INTERA, 2006
 HORIZONTAL DATUM: NAD83/96 NEW YORK STATE
 PLANE COORDINATE SYSTEM WEST ZONE.
 VERTICAL DATUM NAVD 88 DATUM



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	<5	<5	<50	<5	<25	<5	<10	<5	<5	<5	<1
DCE	560	360	250	220	210	170	130.52	150.39	85	39	<1
VC	91	72	72	84	100	130	84	82	100	69	48
DCA	0.28	<5	<50	<5	<25	<5	<10	<5	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TCE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
DCE	5.55	4.4	3.2	3.0	2.8	3.2	3.1	2.1	2.1	1.5
VC	1.9	2.75	2.0	1.9	2.3	1.9	1.9	2.2	2.2	2.9
DCA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	3.2	0.99	0.58	<5	0.41	0.63	<5	<5	<5	<5	<1
DCE	39	30	18	20	14	17	12	23	12	9.7	2.8
VC	35	37	25	18	19	17	14	11	13	9.5	12
DCA	3.2	2.5	1.75	1.8	1.6	1.8	1.3	1.4	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	0.44	1.1	<25	<5	<20	<5	<5	<5	<5	<5	<1
DCE	260	64	150	87	85	90	62	48	41	9.1	3.7
VC	92	15	100	60	81	90	62	59	62	16	7.6
DCA	<5	2	<25	<5	<20	<5	<5	<5	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1
DCE	4.8	3.5	3.4	2.6	2.1	2.7	2.6	1.8	2.5	2.1	2.3
VC	2.3	1.8	2.1	1.7	2.6	2.6	2.0	1.8	2.6	2.6	2.2
DCA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TCE	<5	0.5	<10	<5	<5	<5	<5	<5	<5	<5
DCE	84	40	35	23	21	18	14	11	10	7.3
VC	39	23	44	6.2	36	46	43	31	45	24
DCA	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	0.97	<5	<25	<50	<50	<5	<20	<5	0.25	<5	<1
DCE	130	140	290	290	250	320	310	210.88	281.4	511.8	81
VC	35	22	89	54	60	75	70	63	86	130	48
DCA	<5	<5	<25	<50	<50	<5	<20	<5	0.22	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	<5	<5	<25	<20	<20	<5	<5	<5	<5	<5	<1
DCE	210	200	160	92	120	150	110	111	141.6	2.6	11
VC	77	86	100	39	96	85	78	76	70	<2	<1
DCA	2.3	<5	1.3	<20	<20	1.8	1.6	1.8	1.6	<5	11

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TCE	22	4.2	20	19	12	11	6.05	4	4.6	3.1
DCE	1000	505	710	720	955	985	855	443.4	638.5	282.2
VC	69	41	81	92	125	115	69	64	82	69
DCA	5.4	<5	39	28	26.5	25.5	22	9.3	17	26.0

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	2.4	1.0	<5	<5	<5	<5	<5	<5	<5	<5	<1
DCE	41	25	8.6	33	1.8	21	52	12	24	68	2.1
VC	6.3	2.2	1.8	5.9	<2	5.3	7.7	3.4	5.8	7.2	2.1J
DCA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	<5	<5	<5	<50	<25	<5	<10	<5	<5	<5	<1
DCE	590	460	190	230	150	140	120	141	100.77	56	1.9
VC	81	88	79	80	66	80	66.5	80	64	48	7.4
DCA	3.5	<5	0.45	<50	<25	<5	<5	0.39	<5	<5	1.3J

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	7.7	<5	<50	<5	<17.5	<5	<10	<5	<5	<5	<1
DCE	690	420	290	270	190	170	160	160.9	120.73	62	69
VC	90	60	100	140	185	180	170	140	180	220	190
DCA	<5	<5	<50	<5	<17.5	<5	<5	<5	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	68	<6.4	13	4.5	<50	1.25	<20	0.7	0.46	<5	<1
DCE	1800	3200	520	260	260	320	220	221.9	181.3	373.8	222
VC	95	410	84	54	80	115	73	130	76	150	83
DCA	1.2	46	<100	<50	<50	0.84	<20	0.71	0.54	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TCE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
DCE	4.7	1.1	16	1.3	5.4	5.5	1.4	11	1.2	1.3
VC	3.8	2	19	1.3	5.1	5.1	1.7	16	1.9	1.7
DCA	1.5	1.70	0.62	0.87	<5	0.76	0.96	<5	0.71	5

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	<5	<5	<5	<100	<50	<5	<5	<5	<5	<5	<1
DCE	400	410	340	440	400	340	300	171.5	191.5	57.1	5.9
VC	120	58	100	110	130	120	97	86	93	82	17
DCA	0.95	<5	1.1	<100	<50	2	1.6	0.66	0.58	2	1.3J

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	12	<5	<50	<25	<5	<5	<10	<5	<5	<5	<1
DCE	310	280	200	170	130	130	56.42	120.85	64	16	
VC	40	50	120	68	99	98	86	49	90	86	33
DCA	0.91	<5	<50	<25	<5	<5	<10	0.6	0.41	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	2.6	2.4	1.6	0.99	<25	1.5	0.72	0.76	0.51	<5	1.1J
DCE	420	140	140	110	110	87	74	61.66	58.5	130.52	36
VC	45	13	54	44	59	58	44	49	57	82	39
DCA	1.1	<5	<25	<5	<25	0.65	<5	0.38	<5	<5	<1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TCE	12	7.9	9.1	2.8	1.2	1.4	<10	0.78	0.74	<5	<1
DCE	310	210	160	120	140	110	110	83.1	68.53	88	46
VC	40	27	36	90	62	60	44	59	65	68	47
DCA	0.91	<5	0.83	0.58	0.56	0.77	<10	0.61	0.48	<5	<1

LEGEND:
 - - - - - PROPERTY LINE
 - x - x - x - FENCE
 ⊕ MW-5A MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
 ⊕ MW-5B MONITORING WELL LOCATION (A=OVERBURDEN, B=BEDROCK)
 ○ MH-1 MANHOLE (SANITARY SEWER SAMPLE LOCATION)

CONCENTRATIONS IN ug/L (ppb)

	SAMPLE DATE
TCE	TRICHLOROETHENE
DCE	CIS- AND TRANS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
DCA	1,1-DICHLOROETHANE

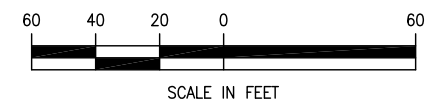


FIGURE 5.2
 FORMER CARBORUNDUM COMPANY
 ELECTRIC PRODUCTS DIVISION
 TOWN OF NIAGARA, NEW YORK
**COC CONCENTRATIONS IN BEDROCK
 GROUNDWATER (2000-2010)**
PARSONS
 40 LA RIVIERE DRIVE, SUITE 350, BUFFALO, NEW YORK 14202 PHONE: 716-541-0730

SOURCE: INTERA, 2006
 HORIZONTAL DATUM: NAD83/96 NEW YORK STATE
 PLANE COORDINATE SYSTEM WEST ZONE.
 VERTICAL DATUM NAVD 88 DATUM

Table 5.1
Laboratory Results
for May 2010 Annual
Monitoring Event

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility				Overburden Wells				
				MW- 2A	MW- 4A	MW- 5A	MW- 7A	MW-10A
		NYSDEC Class GA Groundwater Standards/Guidance Values ⁽¹⁾	Sample ID:	5977478	5980974	5980006	5973985	5977480
			Lab Sample Id:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
			Source:	1194165	1194704	1194549	1193608	1194165
			SDG:	WATER	WATER	WATER	WATER	WATER
			Matrix:	5/11/2010	5/14/2010	5/13/2010	5/6/2010	5/11/2010
			Sampled:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
			Validated:					
			UNITS:					
CAS NO.	COMPOUND							
CHEMICALS OF CONCERN								
VOLATILES-8260B								
75-00-3	Chloroethane	50 (G)	ug/l	1.7 J	ND	ND	ND	ND
75-34-3	1,1-Dichloroethane	5	ug/l	18	21	ND	33	5.7
75-35-4	1,1-Dichloroethene	5	ug/l	4.3 J	2.6 J	ND	ND	1.3 J
156-59-2	cis-1,2-Dichloroethene	5	ug/l	ND	250	110	65	390
156-60-5	trans-1,2-Dichloroethene	5	ug/l	ND	4.9 J	0.97 J	ND	7.6
127-18-4	Tetrachloroethene	5	ug/l	ND	ND	ND	ND	ND
71-55-6	1,1,1-Trichloroethane	5	ug/l	4.9 J	ND	ND	ND	ND
79-01-6	Trichloroethene	5	ug/l	ND	94	ND	ND	ND
75-01-4	Vinyl chloride	2	ug/l	1.2 J	45	84	50	140
NATURAL ATTENUATION PARAMETERS								
HYDROCARBON GASES-RSK 175M								
74-84-0	Ethane	--	ug/l	ND	ND	1.8 J	ND	ND
74-85-1	Ethene	--	ug/l	ND	5.7	45	ND	17
74-82-8	Methane	--	ug/l	30	110	100	ND	71
METALS								
7439-89-6	Iron	300	mg/l		0.581	ND		2.77
OTHER								
BOD	Biochemical Oxygen Demand	--	mg/l		ND	ND		ND
24959-67-9	Bromide	2	mg/l				ND	
7440-44-0	Carbon, Total Organic (TOC)	--	mg/l		1.8	1.3	95.5	1.5
COD	Chemical Oxygen Demand	--	mg/l		ND	15.6 J		38.4 J
16887-00-6	Chloride	250	mg/l		109	188	20.9 J	784
14797-55-8	Nitrate Nitrogen	10	mg/l		ND	0.7		ND
14797-65-0	Nitrite Nitrogen	10	mg/l		ND	ND		ND
14808-79-8	Sulfate	250	mg/l		249	126	52.2 J	250
18496-25-8	Sulfide	50 (G)	mg/l		ND	ND		ND

Notes:

- (1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (October 1998).
- (2) -- indicates no standard or guidance value is available.
- (3) (G) indicates guidance value.
- (4) ND indicated compound was not detected.
- (5) J indicates an estimated concentration.
- (6) Shaded values indicate concentrations exceeding groundwater standard or guidance values.

Table 5.1
Laboratory Results
for May 2010 Annual
Monitoring Event

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility				Overburden Wells				
				NYSDEC Class GA Groundwater Standards/Guidance Values ⁽¹⁾	Sample ID: Lab Sample Id:	MW-11A 5977481	MW-12A 5977482	MW-16A 5977484
CAS NO.	COMPOUND	Source:	Lancaster		Lancaster	Lancaster	Lancaster	Lancaster
CHEMICALS OF CONCERN				SDG:	1194165	1194165	1194165	1193608
				Matrix:	WATER	WATER	WATER	WATER
				Sampled:	5/11/2010	5/11/2010	5/11/2010	5/6/2010
				Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010
				UNITS:				
VOLATILES-8260B								
75-00-3	Chloroethane	50 (G)	ug/l	ND	ND	ND	ND	ND
75-34-3	1,1-Dichloroethane	5	ug/l	ND	1.6 J	ND	20	4.2 J
75-35-4	1,1-Dichloroethene	5	ug/l	ND	ND	ND	11	1.1 J
156-59-2	cis-1,2-Dichloroethene	5	ug/l	ND	16	10	210	51
156-60-5	trans-1,2-Dichloroethene	5	ug/l	ND	ND	ND	1.4 J	ND
127-18-4	Tetrachloroethene	5	ug/l	ND	ND	ND	ND	ND
71-55-6	1,1,1-Trichloroethane	5	ug/l	ND	ND	ND	ND	ND
79-01-6	Trichloroethene	5	ug/l	ND	ND	ND	15	25
75-01-4	Vinyl chloride	2	ug/l	3.2 J	16	180	27	2.6 J
NATURAL ATTENUATION PARAMETERS								
HYDROCARBON GASES-RSK 175M								
74-84-0	Ethane	--	ug/l	ND	ND	ND	ND	ND
74-85-1	Ethene	--	ug/l	ND	14	20	ND	ND
74-82-8	Methane	--	ug/l	51	140	20	ND	13 J
METALS								
7439-89-6	Iron	300	mg/l			ND	3.03	1.2
OTHER								
BOD	Biochemical Oxygen Demand	--	mg/l			ND	ND	ND
24959-67-9	Bromide	2	mg/l				ND	
7440-44-0	Carbon, Total Organic (TOC)	--	mg/l			7	2.9	2.1
COD	Chemical Oxygen Demand	--	mg/l			40.7 J	29.3 J	ND
16887-00-6	Chloride	250	mg/l			260	729 J	104 J
14797-55-8	Nitrate Nitrogen	10	mg/l			ND	ND	ND
14797-65-0	Nitrite Nitrogen	10	mg/l			ND	ND	ND
14808-79-8	Sulfate	250	mg/l			1040	196 J	132
18496-25-8	Sulfide	50 (G)	mg/l			ND	ND	ND

Notes:

- (1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (October 1998)
- (2) -- indicates no standard or guidance value is available.
- (3) (G) indicates guidance value.
- (4) ND indicated compound was not detected.
- (5) J indicates an estimated concentration.
- (6) Shaded values indicate concentrations exceeding groundwater standard or guidance values.

Table 5.1
Laboratory Results
for May 2010 Annual
Monitoring Event

				Bedrock Wells					
Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		NYSDEC Class GA Groundwater Standards/Guidance Values ⁽¹⁾	Sample ID:	MW- 2B	MW- 4B	MW- 5B	MW- 6	MW- 8	MW-10B
CAS NO.	COMPOUND		Lab Sample Id:	5977479	5980975	5980007	5978534	5978535	5973990
			Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
			SDG:	1194165	1194704	1194549	1194351	1194351	1193608
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	
		Sampled:	5/11/2010	5/14/2010	5/13/2010	5/12/2010	5/12/2010	5/6/2010	
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	
		UNITS:							
CHEMICALS OF CONCERN									
VOLATILES-8260B									
75-00-3	Chloroethane	50 (G)	ug/l	ND	ND	ND	ND	ND	ND
75-34-3	1,1-Dichloroethane	5	ug/l	ND	ND	ND	ND	ND	ND
75-35-4	1,1-Dichloroethene	5	ug/l	ND	ND	ND	ND	ND	ND
156-59-2	cis-1,2-Dichloroethene	5	ug/l	3.7 J	2.8 J	36	39	2.3 J	220
156-60-5	trans-1,2-Dichloroethene	5	ug/l	ND	ND	ND	ND	ND	2 J
127-18-4	Tetrachloroethene	5	ug/l	ND	ND	ND	ND	ND	ND
71-55-6	1,1,1-Trichloroethane	5	ug/l	ND	ND	ND	ND	ND	ND
79-01-6	Trichloroethene	5	ug/l	ND	ND	1.1 J	ND	ND	ND
75-01-4	Vinyl chloride	2	ug/l	7.6	12	39	48	2.2 J	83
NATURAL ATTENUATION PARAMETERS									
HYDROCARBON GASES-RSK 175M									
74-84-0	Ethane	--	ug/l	1.9 J	ND	ND	ND	ND	ND
74-85-1	Ethene	--	ug/l	55	ND	ND	23	ND	ND
74-82-8	Methane	--	ug/l	2300	160	63	310	140	ND
METALS									
7439-89-6	Iron	300	mg/l		0.0836 J	0.416	ND		0.591
OTHER									
BOD	Biochemical Oxygen Demand	--	mg/l		ND	ND	ND		ND
24959-67-9	Bromide	2	mg/l						ND
7440-44-0	Carbon, Total Organic (TOC)	--	mg/l		3.4	4.7	3.9		4.9
COD	Chemical Oxygen Demand	--	mg/l		13.3 J	15.6 J	22.4 J		ND
16887-00-6	Chloride	250	mg/l		165	98.5	140 J		89.5 J
14797-55-8	Nitrate Nitrogen	10	mg/l		ND	ND	ND		ND
14797-65-0	Nitrite Nitrogen	10	mg/l		ND	ND	ND		ND
14808-79-8	Sulfate	250	mg/l		305	234	217		244 J
18496-25-8	Sulfide	50 (G)	mg/l		ND	ND	3.4		0.071 J

Notes:

- (1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (October 1998)
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- (4) ND indicated compound was not detected.
- (5) J indicates an estimated concentration.
- (6) Shaded values indicate concentrations exceeding groundwater standard or guidance values.

Table 5.1
Laboratory Results
for May 2010 Annual
Monitoring Event

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility				Bedrock Wells				
				NYSDEC Class GA Groundwater Standards/Guidance Values ⁽¹⁾	Sample ID: Lab Sample Id:	MW-11B 5973991	MW-12B 5977483	MW-13B 5980005
CAS NO.	COMPOUND	Source: SDG: Matrix: Sampled: Validated:	Lancaster 1193608 WATER 5/6/2010 6/16/2010		Lancaster 1194165 WATER 5/11/2010 6/16/2010	Lancaster 1194549 WATER 5/13/2010 6/16/2010	Lancaster 1194549 WATER 5/13/2010 6/16/2010	Lancaster 1194351 WATER 5/12/2010 6/16/2010
CHEMICALS OF CONCERN		UNITS:						
VOLATILES-8260B								
75-00-3	Chloroethane	50 (G)	ug/l	ND	ND	ND	ND	
75-34-3	1,1-Dichloroethane	5	ug/l	1.3 J	ND	ND	1.3 J	
75-35-4	1,1-Dichloroethene	5	ug/l	ND	ND	ND	ND	
156-59-2	cis-1,2-Dichloroethene	5	ug/l	1.9 J	11	46	5.9	
156-60-5	trans-1,2-Dichloroethene	5	ug/l	ND	ND	ND	ND	
127-18-4	Tetrachloroethene	5	ug/l	ND	ND	ND	ND	
71-55-6	1,1,1-Trichloroethane	5	ug/l	ND	ND	ND	ND	
79-01-6	Trichloroethene	5	ug/l	ND	ND	ND	ND	
75-01-4	Vinyl chloride	2	ug/l	7.4	ND	47	33	
NATURAL ATTENUATION PARAMETERS								
HYDROCARBON GASES-RSK 175M								
74-84-0	Ethane	--	ug/l	ND	ND	ND	1.1 J	
74-85-1	Ethene	--	ug/l	ND	ND	1 J	140	
74-82-8	Methane	--	ug/l	ND	ND	65	1300	
METALS								
7439-89-6	Iron	300	mg/l	0.179 J			ND	
OTHER								
BOD	Biochemical Oxygen Demand	--	mg/l	64.7 J			53.6	
24959-67-9	Bromide	2	mg/l	2.3 J				
7440-44-0	Carbon, Total Organic (TOC)	--	mg/l	14.1			14.6	
COD	Chemical Oxygen Demand	--	mg/l	132			137	
16887-00-6	Chloride	250	mg/l	114 J			143	
14797-55-8	Nitrate Nitrogen	10	mg/l	ND			ND	
14797-65-0	Nitrite Nitrogen	10	mg/l	ND			ND	
14808-79-8	Sulfate	250	mg/l	101 J			103	
18496-25-8	Sulfide	50 (G)	mg/l	48.3			46.9	

Notes:

- (1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (October 1998)
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- (4) ND indicated compound was not detected.
- (5) J indicates an estimated concentration.
- (6) Shaded values indicate concentrations exceeding groundwater standard or guidance values.

Table 5.1
Laboratory Results
for May 2010 Annual
Monitoring Event

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		NYSDEC Class GA Groundwater Standards/Guidance Values ⁽¹⁾	Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated: UNITS:	Bedrock Wells			
				MW-16B	Dup of MW-16B	MW-18B	MW-19B
CAS NO.	COMPOUND						
CHEMICALS OF CONCERN							
VOLATILES-8260B							
75-00-3	Chloroethane	50 (G)	ug/l	ND	ND	ND	ND
75-34-3	1,1-Dichloroethane	5	ug/l	ND	ND	ND	ND
75-35-4	1,1-Dichloroethene	5	ug/l	ND	ND	ND	ND
156-59-2	cis-1,2-Dichloroethene	5	ug/l	81	80	69	2.1 J
156-60-5	trans-1,2-Dichloroethene	5	ug/l	ND	ND	ND	ND
127-18-4	Tetrachloroethene	5	ug/l	ND	ND	ND	ND
71-55-6	1,1,1-Trichloroethane	5	ug/l	ND	ND	ND	ND
79-01-6	Trichloroethene	5	ug/l	ND	ND	ND	ND
75-01-4	Vinyl chloride	2	ug/l	48	47	190	2.1 J
NATURAL ATTENUATION PARAMETERS							
HYDROCARBON GASES-RSK 175M							
74-84-0	Ethane	--	ug/l	ND	ND	ND	ND
74-85-1	Ethene	--	ug/l	2.3 J	2.6 J	2.4 J	ND
74-82-8	Methane	--	ug/l	150	160	130	160
METALS							
7439-89-6	Iron	300	mg/l	0.116 J	0.126 J		
OTHER							
BOD	Biochemical Oxygen Demand	--	mg/l	ND	ND		
24959-67-9	Bromide	2	mg/l				
7440-44-0	Carbon, Total Organic (TOC)	--	mg/l	3.8	3.9		
COD	Chemical Oxygen Demand	--	mg/l	15.6 J	27 J		
16887-00-6	Chloride	250	mg/l	105	107		
14797-55-8	Nitrate Nitrogen	10	mg/l	ND	ND		
14797-65-0	Nitrite Nitrogen	10	mg/l	ND	ND		
14808-79-8	Sulfate	250	mg/l	247	238		
18496-25-8	Sulfide	50 (G)	mg/l	0.3	0.25		

Notes:

- (1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (October 1998)
- (2) -- indicates no standard or guidance value is available.
- (3) (G) indicates guidance value.
- (4) ND indicated compound was not detected.
- (5) J indicates an estimated concentration.
- (6) Shaded values indicate concentrations exceeding groundwater standard or guidance values.

SECTION 6 REFERENCES

- Air Force Center for Environmental Excellence (AFCEE), Naval Facilities Engineering Service Center (NFESC), and the Environmental Security Technology Certification Program (ESTCP). 2004. Principles and Practices of Enhanced Anaerobic Bioremediation of Chlorinated Solvents. Prepared by the Parsons Corporation, Denver, Colorado. August.
- DE&H, 2000. Groundwater Monitoring Work Plan for the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036, Final Document. Duke Engineering & Services, January 2000.
- Intera, 2006. Summary Report for the Spring 2006 Groundwater Monitoring Event, Former Carborundum Company – Electric Products Division, Hyde Park Facility, Intera, Inc., August 23, 2006.
- NYSDEC, 2005. Letter to Mr. William Barber (BP) from Michael Hinton (NYSDEC) re: Carborundum Global Site No. 932036, Town of Niagara, Niagara County, New York. Summary Report for the Fifth Year of the Groundwater Monitoring Program. NYSDEC, September 28, 2005.
- Parsons, 2008. Pilot Test Work Plan for *In Situ* Treatment using Enhanced Bioremediation: Former Carborundum Company, Hyde Park Facility, Town of Niagara, New York, June 2008.
- Parsons, 2009. Enhanced Bioremediation Pilot Test (Overburden) Results, Data Delivery, Former Carborundum Company (Hyde Park Facility), July 30, 2009.
- Parsons, 2010. Modification to 26-week Pilot Test Monitoring Event, Letter to NYSDEC, April 5, 2010.

APPENDIX A
WELL BORING LOGS

PARSONS

Hyde Park Pilot Test
Niagara Falls, New York

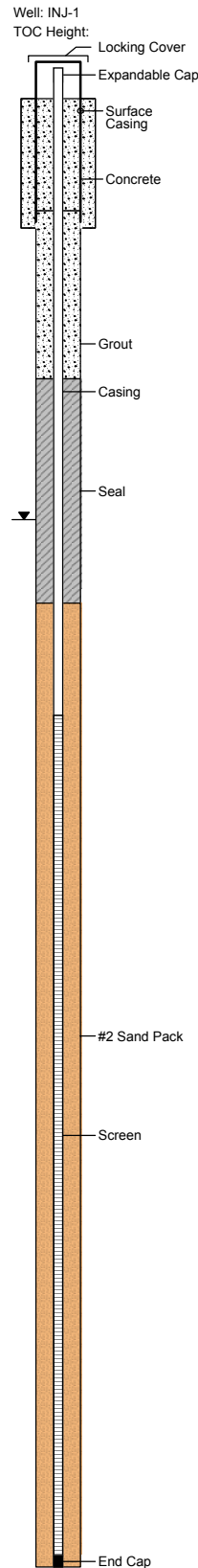
Atlantic Richfield (Former Carborundum Plant)
July 2008

Date Started : 7/9/2008
Date Completed : 7/9/2008
Drilling Method : 4 1/4" ID H.S.A.
Sampling Method : Split-Spoon
Drilling Firm : NORTHCOAST DRLG
Lead Driller : Jason
Geologist : Scott Dillman
Project Manager : Mark Raybuck
Reviewed By : Scott Dillman
Regulatory Agency : NYSDEC

LOG OF BORING/WELL INJ-1 (Page 1 of 1)

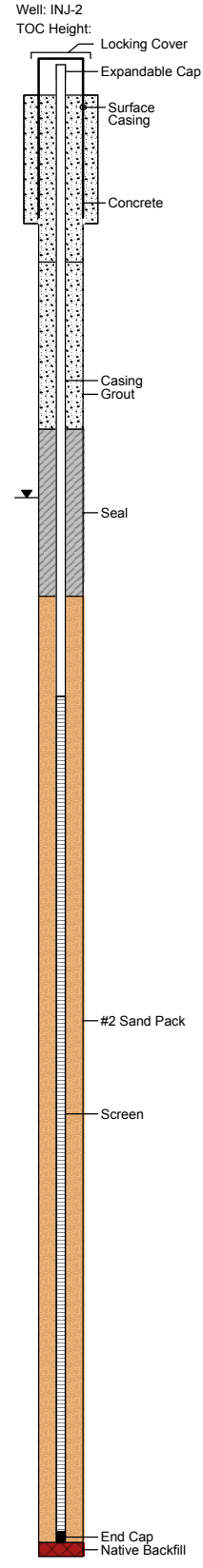
PID Model : MiniRay
PID Calibration : 100 ppm Isobutylene

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
0		Reddish brown SILT and CLAY, trace gravel. Wet at 2 feet.					
1							
2							
3			ML		0.0	NA	NA
4							
5		Reddish brown SILT, some clay, stiff, gray mottling, damp, no odor or stain.					
6			ML		0.0	16	2-2-4-5
7		Reddish brown SILT, some clay, semi-stiff, slight plasticity, moist, no odor or stain.					
8			ML		0.0	18	3-4-5-6
9		As above but moist and sticky.					
10			ML		0.0	18	2-1-3-1
11		Reddish brown SILT, little-some clay, trace sand, mottled, wet soft, no stain or odor.					
12			ML		0.0	17	WOH-WOH-2-1
13		Reddish brown SILT, little sand, trace gravel, wet, soft, no stain or odor.					
14			ML		0.0	9	1-3-6-2
15		Upper 6 inches as above. Reddish brown fine to medium SAND, little silt, trace gravel and coarse sand, no odor or stain.					
16			SM		0.0	13	2-4-4-8
17		Reddish brown SILT, little clay, little coarse sand and gravel, dense. Till. Damp-moist, no odor or stain.					
18			ML		0.0	14	24-36-50/4"
19		Reddish brown SILT, trace clay, trace coarse sand and gravel, dense, damp. Till. no odor or stain.					
20			ML		0.0	24	42-39-29-19
21		Reddish brown SILT as above. Upper 6 inches of sample dilatent SILT (auger fill?).					
22			ML		0.0	8	7-24-27-18
23		Reddish brown SILT, little to some coarse gravel, trace coarse sand, dense, moist-damp. Till. No stain or odor.					
24			ML		0.0	15	14-30-44-38
25		Till as above upper 2 inches. Rest of sample was dark gray dolomite gravel. Auger refusal at 26.25 feet.					
26			Dolo		0.0	10	10-30-50/4"



Monitoring Well Construction Information

CONSTRUCTION
Boring Diameter : ~8" O.D.
WELL RISER
Material : PVC Sch 40
Diameter : 2-inch
Joints : Threaded
WELL SCREEN
Material : PVC Sch 40
Diameter : 2-inch
Joints : Threaded
Opening Length : 0.02-inch slots
Length : 15-feet
SAND PACK
Material : #2 Silica Filter Sand
SEAL
Material : Bentonite Pellets
GROUT
Material : Bentonite Hole Plug
WELL HEAD
Protection : Locking Pro-Cover
Well Cap : Expandable Plug
Well Pad : 2'x2'x8"

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count	Well: INJ-2 TOC Height: 	Monitoring Well Construction Information
0		Reddish brown SILT and CLAY, moist, no odor or stain.							CONSTRUCTION Boring Diameter : ~8" O.D. WELL RISER Material : PVC Sch 40 Diameter : 2-inch Joints : Threaded WELL SCREEN Material : PVC Sch 40 Diameter : 2-inch Joints : Threaded Opening : 0.02-inch slots Length : 15-feet SAND PACK Material : #2 Silica Filter Sand SEAL Material : Bentonite Pellets GROUT Material : Bentonite Hole Plug WELL HEAD Protection : Locking Pro-Cover Well Cap : Expandable Plug Well Pad : 2'x2'x8"
1									
2									
3			ML		0.0	NA	NA		
4									
5									
6		Auger from 5 feet to 20 feet. No sampling.				NA	A-A-A		
7									
8						NA	A-A-A-A		
9									
10						NA	A-A-A-A		
11									
12						NA	A-A-A-A		
13									
14						NA	A-A-A-A		
15									
16						NA	A-A-A-A		
17									
18						NA	A-A-A-A		
19									
20						NA	A-A		
21		Reddish brown SILT, some clay, little gravel, little sand in lenses in bottom 6 inches of sample, wet, no stain or odor.	ML						
22		Auger to refusal at 26.5 feet. Dark gray dolomite at bottom of boring.			0.0	18	20-25-30-35		
23						NA	A-A-A-A		
24									
25						NA	A-A-A-A		
26						NA	A		

PARSONS

Hyde Park Pilot Test
Niagara Falls, New York

Atlantic Richfield (Former Carborundum Plant)
July 2008

Date Started : 7/7/2008
Date Completed : 7/9/2008
Drilling Method : 4 1/4" ID H.S.A.
Sampling Method : Split-Spoon
Drilling Firm : NORTHCOAST DRLG
Lead Driller : Jason
Geologist : Scott Dillman
Project Manager : Mark Raybuck
Reviewed By : Scott Dillman
Regulatory Agency : NYSDEC

BORING/WELL PMW-1 (Page 1 of 1)

PID Model : MiniRay
PID Calibration : 100 ppm Isobutylene

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count	Well: PMW-1 TOC Height:	Monitoring Well Construction Information
									CONSTRUCTION Boring Diameter : ~8" O.D. WELL RISER Material : PVC Sch 40 Diameter : 2-inch Joints : Threaded WELL SCREEN Material : PVC Sch 40 Diameter : 2-inch Joints : Threaded Opening : 0.01-inch slots Length : 15-feet SAND PACK Material : #00 Silica Filter Sand SEAL Material : Bentonite Pellets GROUT Material : Bentonite Hole Plug WELL HEAD Protection : Locking Pro-Cover Well Cap : Expandable Plug Well Pad : 2'x2'x8"
		Water Levels ▽ After Completion: 8.47 ft (TOC) 7/10/2008 ▽							
0		Reddish brown SILT and CLAY, trace gravel, water at 2.5 feet, no odor or stain.							
1									
2									
3			ML		0.0	NA	NA		
4									
5		Auger from 5 feet to 20 feet. No sampling.							
6						NA	A-A-A-A		
7									
8						NA	A-A-A-A		
9									
10						NA	A-A-A-A		
11									
12						NA	A-A-A-A		
13									
14						NA	A-A-A-A		
15									
16						NA	A-A-A-A		
17									
18						NA	A-A-A-A		
19									
20		Reddish brown SILT, some clay, trace coarse sand and gravel, dense, moist, no stain or odor.	ML						
21									
22		Auger to refusal at 26 feet. Dark gray dolomite at bottom of boring.			0.0	10	15-25-22-25		
23						NA	A-A-A-A		
24									
25						NA	A-A-A-A		
26									

PARSONS

Hyde Park Pilot Test
Niagara Falls, New York

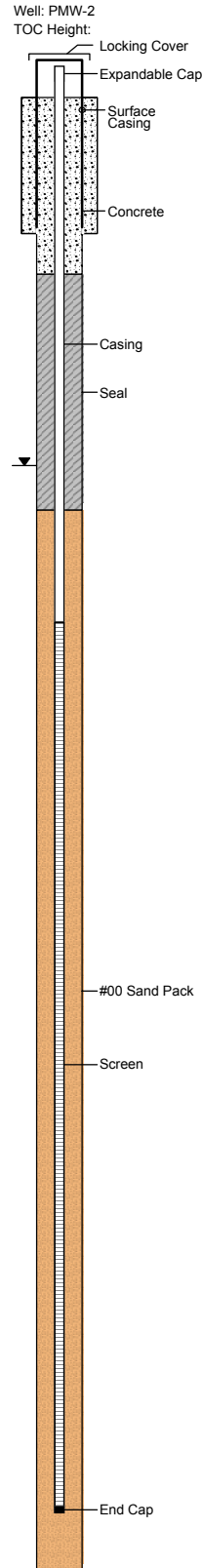
Atlantic Richfield (Former Carborundum Plant)
July 2008

Date Started : 7/7/2008
Date Completed : 7/9/2008
Drilling Method : 4 1/4" ID H.S.A.
Sampling Method : Split-Spoon
Drilling Firm : NORTHCOAST DRLG
Lead Driller : Jason
Geologist : Scott Dillman
Project Manager : Mark Raybuck
Reviewed By : Scott Dillman
Regulatory Agency : NYSDEC

BORING/WELL PMW-2 (Page 1 of 1)

PID Model : MiniRay
PID Calibration : 100 ppm Isobutylene

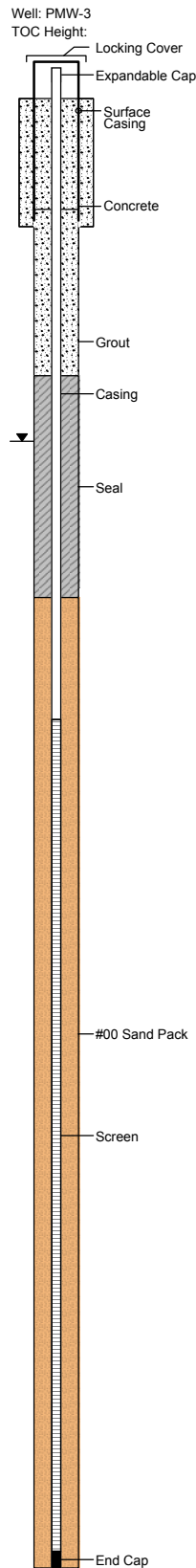
Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
After Completion: 8.74 ft (TOC) 7/10/2008 							
0		Reddish brown SILT and CLAY, trace gravel, moist-wet, no odor or stain.					
1							
2			ML		0.0	NA	NA
3							
4							
5		Auger from 5 feet to 15 feet. No sampling.					
6						NA	A-A-A-A
7							
8						NA	A-A-A-A
9							
10						NA	A-A-A-A
11							
12						NA	A-A-A-A
13							
14						NA	A-A-A-A
15		Reddish brown SILT and fine-medium SAND, trace gravel, wet, no stain or odor.					
16			ML		0.0	12	WOH-3-17-16
17		Auger to 25 feet. No sampling.					
18						NA	A-A-A-A
19							
20						NA	A-A-A-A
21							
22						NA	A-A-A-A
23							
24						NA	A-A-A-A
25		Dark grey, SAND and GRAVEL, little silt, loose, wet, no odor, no stain.			0.0	NA	50/5"



Monitoring Well Construction Information

CONSTRUCTION
 Boring Diameter : ~8" O.D.
WELL RISER
 Material : PVC Sch 40
 Diameter : 2-inch
 Joints : Threaded
WELL SCREEN
 Material : PVC Sch 40
 Diameter : 2-inch
 Joints : Threaded
 Opening Length : 0.01-inch slots
 Length : 15-feet
SAND PACK
 Material : #00 Silica Filter Sand
SEAL
 Material : Bentonite Pellets
GROUT
 Material : None
WELL HEAD
 Protection : Locking Pro-Cover
 Well Cap : Expandable Plug
 Well Pad : 2'x2'x8"

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
		▼ After Completion: 8.68 ft (TOC) 7/10/2008 ▽					
0		Reddish brown SILT and CLAY, trace brick, moist, no odor or stain.	ML	[Red Bar]	0.0	NA	NA
1							
2							
3							
4							
5		Auger from 5 feet to 15 feet. No sampling.				NA	A-A-A-A
6						NA	A-A-A-A
7						NA	A-A-A-A
8						NA	A-A-A-A
9						NA	A-A-A-A
10						NA	A-A-A-A
11						NA	A-A-A-A
12						NA	A-A-A-A
13						NA	A-A-A-A
14						NA	A-A-A-A
15		Reddish fine-medium SAND, trace gravel, loose, wet (may be fall-in/wash from above?) Reddish brown SILT, little fine sand, trace gravel.	ML	[Red Bar]	0.0	14	1-7-6-13
16							
17		Augered from 17 to 25 feet. No sampling.				NA	A-A-A-A
18						NA	A-A-A-A
19						NA	A-A-A-A
20						NA	A-A-A-A
21						NA	A-A-A-A
22						NA	A-A-A-A
23						NA	A-A-A-A
24						NA	A-A-A-A
25		Reddish brown SILT, some fine-medium sand. Dark gray dolomite gravel at bottom of boring. Auger refusal at 26.5 feet.	ML	[Red Bar]	0.0	NA	20-50/2"
26							



Monitoring Well Construction Information

CONSTRUCTION	
Boring Diameter	: ~8" O.D.
WELL RISER	
Material	: PVC Sch 40
Diameter	: 2-inch
Joints	: Threaded
WELL SCREEN	
Material	: PVC Sch 40
Diameter	: 2-inch
Joints	: Threaded
Opening	: 0.01-inch slots
Length	: 15-feet
SAND PACK	
Material	: #00 Silica Filter Sand
SEAL	
Material	: Bentonite Pellets
GROUT	
Material	: Bentonite Hole Plug
WELL HEAD	
Protection	: Locking Pro-Cover
Well Cap	: Expandable Plug
Well Pad	: 2'x2'x8"

PARSONS

Hyde Park Pilot Test
Niagara Falls, New York

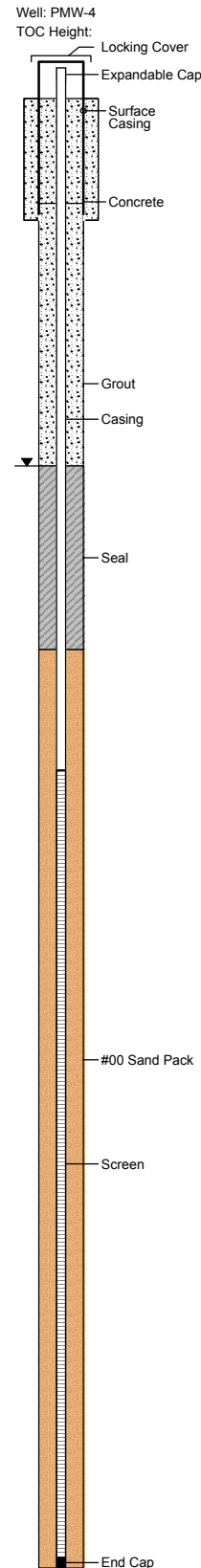
Atlantic Richfield (Former Carborundum Plant)
July 2008

Date Started : 7/1/2008
Date Completed : 7/2/2008
Drilling Method : 4 1/4" ID H.S.A.
Sampling Method : Split-Spoon
Drilling Firm : NORTHCOAST DRLG
Lead Driller : Jason
Geologist : Scott Dillman
Project Manager : Mark Raybuck
Reviewed By : Scott Dillman
Regulatory Agency : NYSDEC

BORING/WELL PMW-4 (Page 1 of 1)

PID Model : MiniRay
PID Calibration : 100 ppm Isobutylene

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count	Water Levels	
								▼ After Completion: 9.50 ft (TOC) 7/10/2008	▽
0		Reddish brown SILT and CLAY, moist, no odor or stain. Hit solid obstruction at 4.5 feet in original location. Moved location about 3 feet to west.							
1									
2			ML		0.0	NA	NA		
3									
4									
5		Reddish brown SILT, some clay, stiff, damp-moist, no odor or stain.							
6					0.0	18	6-7-10-10		
7			ML						
8					0.0	18	3-5-7-7		
9		Reddish-brown Silt as above changing to sticky soft CLAY, little silt, moist-wet, no odor or stain, .							
10			ML		0.0	14	1-2-1-2		
11		Reddish brown CLAY, little silt, soft, sticky, some roll, wet, no odor or stain.							
12			CL		0.0	16	1-2-1-1		
13		As above. Silt content increased with depth to some. No odor or stain.							
14			CL		0.0	20	WOH-1-1-1		
15		Reddish brown SILT, some clay, fine-medium sand lenses up to 1 inch in lower sample with trace gravel, wet.							
16			ML-CL		0.0	12	1-2-3-5		
17		Reddish brown fine-medium SAND, little silt, trace clay and gravel. Compaction increased with depth. Reddish brown, SAND and SILT, little coarse sand and gravel, Till, slight odor.							
18			SM		0.0	14	WOH-8-18-32		
19		Dark gray dolomite gravel/cobble. Poor recovery.							
20			GM		0.0	3	50/5"		
21		Reddish brown SILT, some sand, little gravel, Till, moist, no odor or stain.							
22			ML		0.0	5	10-42-50/3"		
23		Reddish brown SILT, some sand, little coarse sand-gravel, dense, Till, moist, no odor or stain. Some loose silty sand, caved material from above on top of sample.							
24			ML		0.0	14	20-13-15-30		
25		Dense Till as above.							
26			ML		0.0	12	10-32-50/5"		
27		Dark gray dolomite gravel.							
28			GM		0.0	0.5	50/5"		



Monitoring Well Construction Information

CONSTRUCTION
Boring Diameter : ~8" O.D.
WELL RISER
Material : PVC Sch 40
Diameter : 2-inch
Joints : Threaded
WELL SCREEN
Material : PVC Sch 40
Diameter : 2-inch
Joints : Threaded
Opening Length : 0.01-inch slots
Length : 15-feet
SAND PACK
Material : #00 Silica Filter Sand
SEAL
Material : Bentonite Pellets
GROUT
Material : Bentonite Hole Plug
WELL HEAD
Protection : Locking Pro-Cover
Well Cap : Expandable Plug
Well Pad : 2'x2'x8"

PARSONS

Hyde Park Pilot Test
Niagara Falls, New York

Atlantic Richfield (Former Carborundum Plant)
July 2008

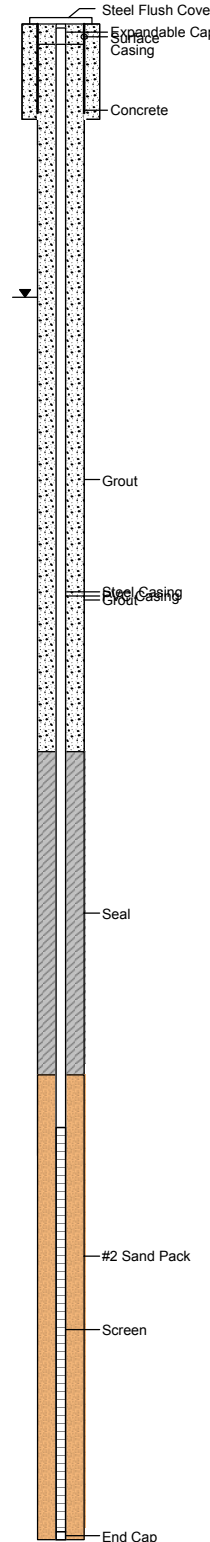
Date Started : 7/1/2008
Date Completed : 7/11/2008
Drilling Method : 4 1/4" ID HSA/HQ Coring
Sampling Method : Split-Spoon/Core
Drilling Firm : NORTHCOAST DRLG
Lead Driller : Jason
Geologist : Scott Dillman
Project Manager : Mark Raybuck
Reviewed By : Scott Dillman
Regulatory Agency : NYSDEC

BORING/WELL PMW-8 (Page 1 of 1)

PID Model : MiniRay
PID Calibration : 100 ppm Isobutylene

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery/Inches	Blow Count
0		Asphalt 0-6 inches. Reddish brown SILT, little clay, damp, moist at 4.5 feet, no odor or stain.					
1							
2							
3			ML		0.0	NA	HAND
4							
5		Reddish brown SILT, little-some clay, stiff, damp-moist, stiff, no odor or stain.					
6			ML		0.0	18	3-4-3-5
7		Reddish-brown Silt, some clay, damp, moist at bottom, stiff, no odor or stain.					
8			ML		0.0	18	3-4-6-7
9		Reddish brown CLAY, some silt, plastic, will roll, moist-wet, no odor or stain.					
10			CL		0.0	14	3-1-1-3
11		As above grading to SILT, little-some clay, little fine-medium sand, trace coarse sand. Sand in lenses. Till. Wet, no odor or stain.					
12			CL-SL		0.0	16	1-2-1-6
13		Reddish brown SILT, some fine-medium sand, trace coarse sand and gravel, trace clay, wet grading to moist, no odor or stain.					
14							
15			ML		0.0	20	3-4-5-10
16							
17							
18		Reddish brown SILT, little clay, little fine-medium sand, trace little-coarse sand and gravel, dense-compacted, Till damp.					
19			ML		0.0	14	11-22-26-33
20		Reddish brown SAND and SILT, little gravel, trace clay, dense, moist, no odor or stain.					
21			SM-ML		0.0	3	10-13-23-50/5"
22		Till as above.					
23			ML		0.0	5	10-28-50/5"
24		Cobble in shoe. Poor recovery.					
25			ML		0.0	14	14-39-50/5"
26		Reddish brown SILT and SAND, little coarse sand and gravel, trace cobble, dense, moist-wet, no odor or stain. Auger refusal at 26.5 feet.					
27			ML		0.0	12	13-29-50/2"
28		Drill socket into bedrock with rollerbit from 26.5 to 28.5 feet.					
29			Dolo		0.0	0.5	ROLLER
30		HQ Core. Drillers noted multiple fractures during drilling based on water loss and drilling properties. Gray-dark gray dolomite, healed fractures and vugs, gypsum crystals in vugs, some open vugs. Open fractures at 12-14 inches, 23-24 inches, and 33-35 inches and vugs 39-41 inches from top of core. Bottom 6 inches of core not recovered. RQD = 33%					
31			Dolo		NA	41" of 60"	HQ Core
32							
33							
34		HQ core. Gray-dark gray dolomite. Upper 26 inches had scattered fractures and vugs. Next 32 inches had massive dolomite. One vug with gypsum crystal fill. Bottom 2 inches had bedding plane fractures. RQD = 53%. Boring terminated at 37.5 feet.					
35			Dolo		NA	60" of 48"	HQ Core
36							
37							
38							

Well: PMW-8
TOC Height:



Monitoring Well Construction Information

CONSTRUCTION
Boring Diameter : ~8" O.D. upper, ~4" lower
WELL RISER
Material : PVC Sch 40
Diameter : 2-inch
Joints : Threaded
WELL SCREEN
Material : PVC Sch 40
Diameter : 2-inch
Joints : Threaded
Opening Length : 0.01-inch slots
Length : 10-feet
SAND PACK
Material : #2 Silica Filter Sand
SEAL
Material : Bentonite Pellets
GROUT
Material : Cement-Bentonite
WELL HEAD
Protection : Bolt Down Flush Cover
Well Cap : Expandable Plug
Well Pad : 2'x2'x8"

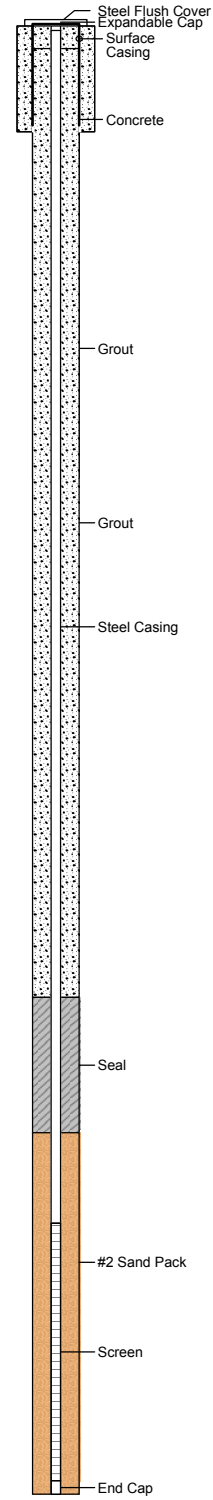
STEEL CASING
Diameter : 4-inch
Placement : Near surface to 28 ft.

Hyde Park Pilot Test Niagara Falls, New York		Date Started : 9/17/2009	BORINGWELL INJ-03 (Page 1 of 1)
Atlantic Richfield (Former Carborundum Plant)		Date Completed : 10/2/2009	
September 2008		Drilling Method : 6 1/4" ID HSA/HQ Coring	
		Sampling Method : Split-Spoon/Core	
		Drilling Firm : NORTHCOAST DRLG	
		Lead Driller : B. Adams	PID Model : MiniRay
		Geologist : Mark Raybuck	PID Calibration : 100 ppm Isobutylene
		Project Manager : B. Adams	
		Reviewed By : B. Adams	
		Regulatory Agency : NYSDEC	

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count	Water Levels	
								▼ After Completion: ___ ft (TOC) insert date here	▽
0		Concrete surface.	AR						
1		Black SILT and CLAY, trace sand and gravel subbase.	ML-CL		0.0	NA	HAND		
2		Reddish brown CLAY, some silt, damp, no odor, no stain.							
3			CL		0.0	NA	HAND		
4									
5					0.0	NA	HAND		
6									
7		Reddish brown SILT, some clay, firm, damp, no odor or staining.	ML		0.0	19	3-5-6		
8									
9		Reddish brown SILT, some clay, soft, moist to wet.	ML		0.0	20	1-1-3-4		
10									
11		Reddish brown, SILT, trace clay, trace sand and gravel, soft, wet.	ML		0.0	20	1-1-1-1		
12									
13		No recovery (dark grey gravel in shoe).				NA	0	8-11-13-14	
14			GM						
15		Reddish brown, fine to medium SAND, trace silt, loose to medium dense, wet.	SM		0.0	14	10-5-21-21		
16									
17		Reddish brown, fine to medium SAND, trace silt, medium dense, dark grey dolomite cobbles, wet.	SM		0.0	13	18-19-21-21		
18									
19					0.0	12	18-21-30-11		
20		Reddish brown SAND and SILT, trace fine sand.	SM						
21		Dark grey DOLOMITE GRAVEL cobbles.	GM		0.0	4	50/5"		
22									
23		Dark grey, fine to medium SAND, some silt, trace dolomite cobbles.	SM						
24		Dark grey dolomite bedrock.	DO		NA	3	50/5"		
25		Auger refusal at 24 feet. Drill socket into bedrock with roller bit from 24 to 26 feet.	DO		NA	NA	ROLLER		
26									
27		RQD = 35%. Hard grey dolomite with fractures.							
28									
29			DO		0.0	5' of 60"	HQ Core		
30									
31									
32		RQD = 68%. Hard grey dolomite.	DO		0.0	21" of 24"	HQ Core		
33									
34									

Well: INJ-03

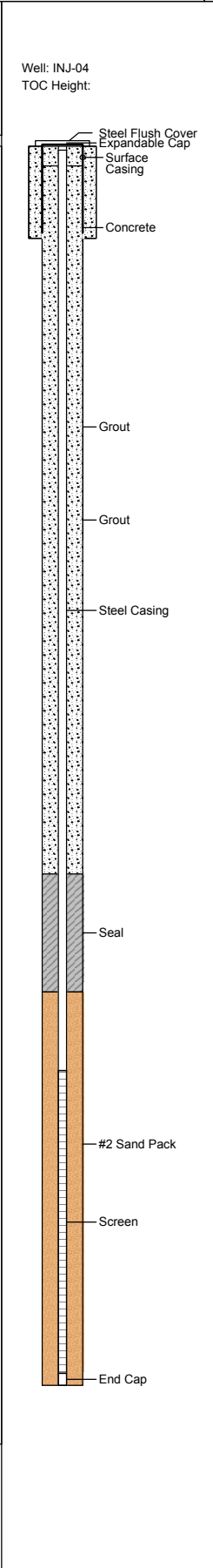
TOC Height:



Monitoring Well Construction Information	
CONSTRUCTION	
Boring Diameter	: ~10" O.D. upper, ~6" lower
WELL RISER	
Material	: Stainless Steel
Diameter	: 4-inch
Joints	: Threaded
Opening Length	: 6-feet
WELL SCREEN	
Material	: Stainless Steel
Diameter	: 4-inch
Joints	: Threaded
Opening Length	: 6-feet
SAND PACK	
Material	: #2 Silica Filter Sand
SEAL	
Material	: Bentonite Pellets
GROUT	
Material	: Cement-Bentonite
WELL HEAD	
Protection	: Bolt Down Flush Cover
Well Cap	: Expandable Plug
Well Pad	: 2'x2'x8"

		Date Started : 9/29/2009	BORINGWELL INJ-04	
		Date Completed : 10/2/2009	(Page 1 of 1)	
Hyde Park Pilot Test Niagara Falls, New York		Drilling Method : 6 1/4" ID HSA/HQ Coring	PID Model : MiniRay	
Atlantic Richfield (Former Carborundum Plant)		Sampling Method : Split-Spoon/Core	PID Calibration : 100 ppm Isobutylene	
September 2008		Drilling Firm : NORTHCOAST DRLG		
		Lead Driller : Geologist : B. Adams		
		Project Manager : Mark Raybuck		
		Reviewed By : B. Adams		
		Regulatory Agency : NYSDEC		

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
0		Blacktop asphalt.	AR				
1		GRAVEL and SAND subbase fill material.	GM		0.0	NA	HAND
2		Brown CLAY, trace silt, stiff, dry, no staining or odors.	CL		0.0	NA	HAND
3			CL		0.0	NA	HAND
4		Brown CLAY, trace silt, firm, damp, no stainin or odors.	CL		0.0	NA	HAND
5			CL		0.0	NA	HAND
6							
7		Drilled to 11', no samples.					
8							
9							
10							
11							
12		Reddish brown, SILT, some sand, and fine to medium dolomite gravel, soft, moist to wet.	ML		NA	NA	3-3-4-6
13		Drilled to 18', no samples.					
14							
15							
16							
17							
18		Reddish brown SILT, some dolomite gravel, very stiff, damp.	ML		NA	NA	15-20-18-20
19		Reddish brown SAND seam.	SM				
20		Reddish brown SILT, wet.	ML				
21		Drilled to auger refusal at 22 feet.					
22		Drilled socket into bedrock with roller bit from 22 to 24 feet.					
23			DO		NA	NA	ROLLER
24		RQD = 50%.					
25							
26			DO		0.0	60" of 60"	HQ Core
27		Lost 1.5' in boring, fell out of core barrel.					
28							
29		RQD = 40%					
30							
31			DO		0.0	30" of 36"	HQ Core
32		Lost one foot of recovery in boring.					
33							
34							

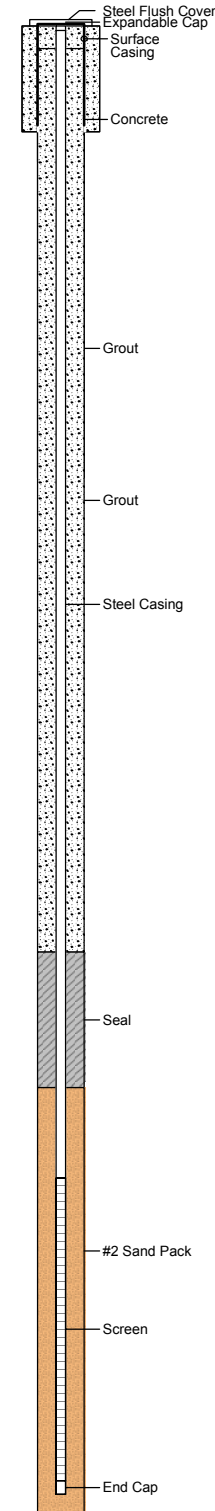


Monitoring Well Construction Information	
CONSTRUCTION	
Boring Diameter	: ~10" O.D. upper, ~6" lower
WELL RISER	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
WELL SCREEN	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
Opening	: 0.02-inch slots
Length	: 8-feet
SAND PACK	
Material	: #2 Silica Filter Sand
SEAL	
Material	: Bentonite Pellets
GROUT	
Material	: Cement-Bentonite
WELL HEAD	
Protection	: Bolt Down Flush Cover
Well Cap	: Expandable Plug
Well Pad	: 2'x2'x8"

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
0		Concrete.	AR				
1		Black SAND and GRAVEL subbase fill.	CL		0.0	NA	HAND
2			CL				
3		Brown CLAY, stiff, dry, no staining or odors.	CL		0.0	NA	HAND
4			CL				
5		Brown CLAY, trace silt, soft to firm, damp, no staining or odors.	CL		0.0	NA	HAND
6			CL				
7		Drilled to 11', no samples.					
8							
9							
10							
11							
12		Reddish brown SILT, firm to stiff, trace fine sand, trace fine to medium dolomite gravel.	ML		0.0	14	3-7-8-12
13		Drilled to 18', no samples.					
14							
15							
16		Dark grey dolomite rock cobble layer.	GM				
17			GM				
18							
19		Reddish brown fine-grained SAND, medium dense, wet, no staining or odors.	SM		NA	NA	8-8-13-14
20		Drilled to 23.5', no samples. 6 1/4" I.D. HSA					
21							
22							
23							
24		Auger refusal at 23.5 feet. Drill socket into bedrock with rollerbit from 23.5 to 25.5 feet.	DO				ROLLER
25			DO				
26		RQD = 50%. DOLOMITE bedrock, hard, some fractures.	DO		0.0	48.7" of 48"	HQ Core
27			DO				
28			DO				
29			DO				
30		RQD = 0%. Heavily fractured DOLOMITE bedrock.	DO		NA	48" of 48"	HQ Core
31			DO				
32		CLAY layer.	CL				
33		Lost 6" of recovery in borehole.	DO				
34							

Well: PMW-5

TOC Height:

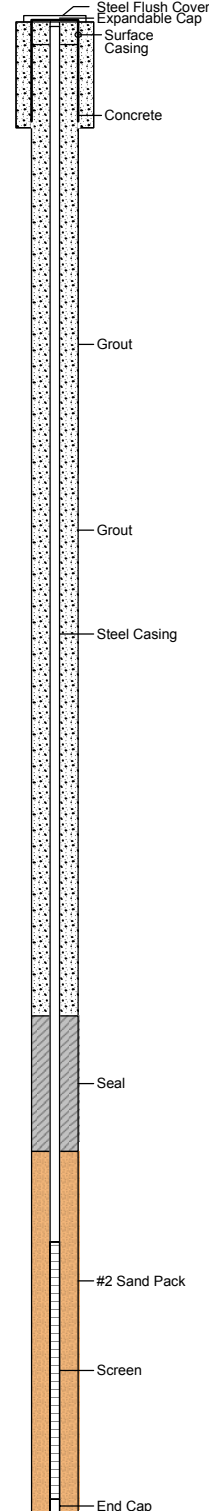


Monitoring Well Construction Information

CONSTRUCTION	
Boring Diameter	: ~10" O.D. upper, ~6" lower
WELL RISER	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
WELL SCREEN	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
Opening	: 0.02-inch slots
Length	: 9-feet
SAND PACK	
Material	: #2 Silica Filter Sand
SEAL	
Material	: Bentonite Pellets
GROUT	
Material	: Cement-Bentonite
WELL HEAD	
Protection	: Bolt Down Flush Cover
Well Cap	: Expandable Plug
Well Pad	: 2'x2'x8"

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
0		Concrete surface.	AR				
1		Black stained SILT and CLAY, trace sand and gravel, subbase.	ML-CL		0.0	NA	HAND
2			ML-CL		0.0	NA	HAND
3		Reddish brown SILT and CLAY, damp, no stain or odors.	ML-CL		0.0	NA	HAND
4			ML-CL		0.0	NA	HAND
5		Reddish brown SILT, some clay, damp, firm, no staining or odors.	ML		0.0	13	6-4-8
6			ML		0.0	24	2-2-2-2
7		Reddish brown SILT, some clay, damp to moist, soft, no staining or odors.	ML		0.0	24	2-2-2-2
8			ML		0.0	24	2-2-2-2
9		Reddish brown SILT and CLAY, trace fine sand, trace dolostone gravel cobbles, soft, wet.	ML-CL		0.0	8	4-5-7-7
10			ML-CL		0.0	8	4-5-7-7
11		Dark grey, SAND, with dark grey, fine dolostone cobbles, medium dense, no staining or odors.	SM		0.0	5	12-11-13-7
12			SM		0.0	5	12-11-13-7
13		No Recovery, pushed a rock.			0.0	0	13-11-15-18
14			GM		0.0	0	13-11-15-18
15			GM		0.0	0	11-12-10-20
16		Reddish brown SILT, stiff to very stiff, damp, no staining or odors.	ML		0.0	18	11-18-20-20
17			ML		0.0	18	11-18-20-20
18		Reddish brown SILT, stiff, moist to wet, no staining or odors.	ML		NA	13	10-12-10-16
19			ML		NA	13	10-12-10-16
20		Same as above (wet).	ML		NA	NA	1-8-9-50/1"
21			ML		NA	NA	1-8-9-50/1"
22		Dolomite bedrock. Auger refusal at 23 feet. Drill socket into bedrock with rollerbit from 23 to 27 feet. using 3 7/8" rotary bit.	DO		NA	NA	ROLLER
23			DO		NA	NA	ROLLER
24		RQD = 42%. Hard grey dolomite with fractures.	DO		NA	26" of 36"	HQ Core
25			DO		NA	26" of 36"	HQ Core
26		RQD = 50%. Hard grey dolomite.	DO		NA	34" of 36"	HQ Core
27			DO		NA	34" of 36"	HQ Core
28		CLAY layer.	CL				
29		Lost 6" of recovery in borehole.	DO				
30			DO				
31							
32							
33							
34							

Well: PMW-6
TOC Height:



Monitoring Well Construction Information

CONSTRUCTION

Boring Diameter : ~10" O.D. upper, ~6" lower

WELL RISER

Material : Stainless Steel
Diameter : 4-Inch
Joints : Threaded

WELL SCREEN

Material : Stainless Steel
Diameter : 4-Inch
Joints : Threaded
Opening Length : 0.02-inch slots
Length : 6-feet

SAND PACK

Material : #2 Silica Filter Sand

SEAL

Material : Bentonite Pellets

GROUT

Material : Cement-Bentonite

WELL HEAD

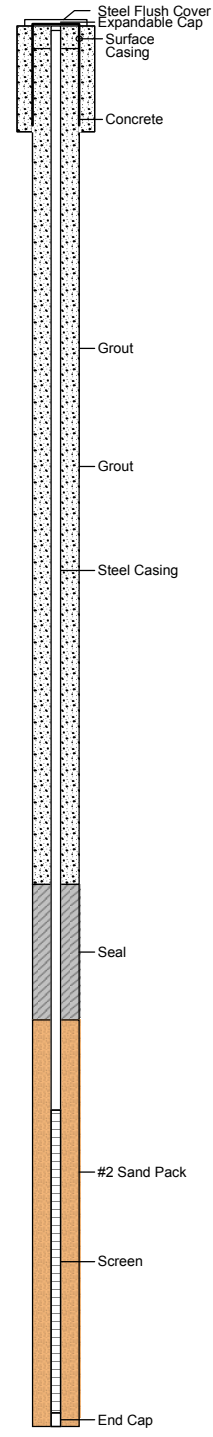
Protection : Bolt Down Flush Cover
Well Cap : Expandable Plug
Well Pad : 2'x2'x8"

Hyde Park Pilot Test Niagara Falls, New York		Date Started : 9/25/2009 Date Completed : 10/2/2009 Drilling Method : 6 1/4" ID HSA/HQ Coring Sampling Method : Split-Spoon/Core Drilling Firm : NORTHCOAST DRLG Lead Driller : Geologist : B. Adams Project Manager : Mark Raybuck Reviewed By : B. Adams Regulatory Agency : NYSDEC	BORING/WELL PMW-7 (Page 1 of 1)
Atlantic Richfield (Former Carborundum Plant) September 2008		PID Model : MiniRay PID Calibration : 100 ppm Isobutylene	

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
0		Blacktop asphalt.	AR				
1		SAND and GRAVEL slag fill material, subbase.	GP		0.0	NA	HAND
2							
3		Dry, brown CLAY, trace silt.	CL		0.0	NA	HAND
4		Dry, brown and grey CLAY, trace silt.					
5			ML		0.0	NA	HAND
6							
7		Drilled to 11', 6 1/4 I.D. HSA. No samples.					
8							
9							
10							
11							
12		Brown SILT, some fine sand, some fine to medium dolomite gravel, moist to wet, soft	GM		NA	14	1-1-2
13		Drilled to 18', 6 1/4" I.D. HSA. No samples.					
14							
15							
16							
17							
18		No recovery.					
19					NA	0	40-51/5"
20		Drilled to refusal, 6 1/4" I.D. HSA. No samples (22.5').					
21							
22							
23		Auger refusal at 22.5 feet. 6 1/4" I.D. HSA. Drill socket into bedrock with roller bit from 22.5 to 24.5 feet.	DO		NA	NA	ROLLER
24							
25		RQD = 75%. Hard, grey dolomite bedrock, few fractures.					
26			DO		0.0	47" of 54"	HQ Core
27							
28							
29			DO				
30		SAND layer.	SM				
31		RQD = 17%.	DO		NA	48" of 48"	HQ Core
32		12" fell out back into boring.	DO				
33							
34							

Well: PMW-7

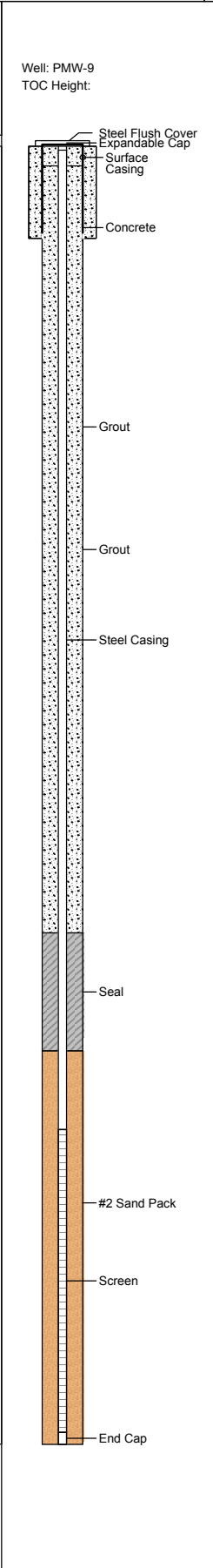
TOC Height:



Monitoring Well Construction Information	
CONSTRUCTION	
Boring Diameter	: ~10" O.D. upper, ~6" lower
WELL RISER	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
WELL SCREEN	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
Opening	: 0.02-inch slots
Length	: 7-feet
SAND PACK	
Material	: #2 Silica Filter Sand
SEAL	
Material	: Bentonite Pellets
GROUT	
Material	: Cement-Bentonite
WELL HEAD	
Protection	: Bolt Down Flush Cover
Well Cap	: Expandable Plug
Well Pad	: 2'x2'x8"

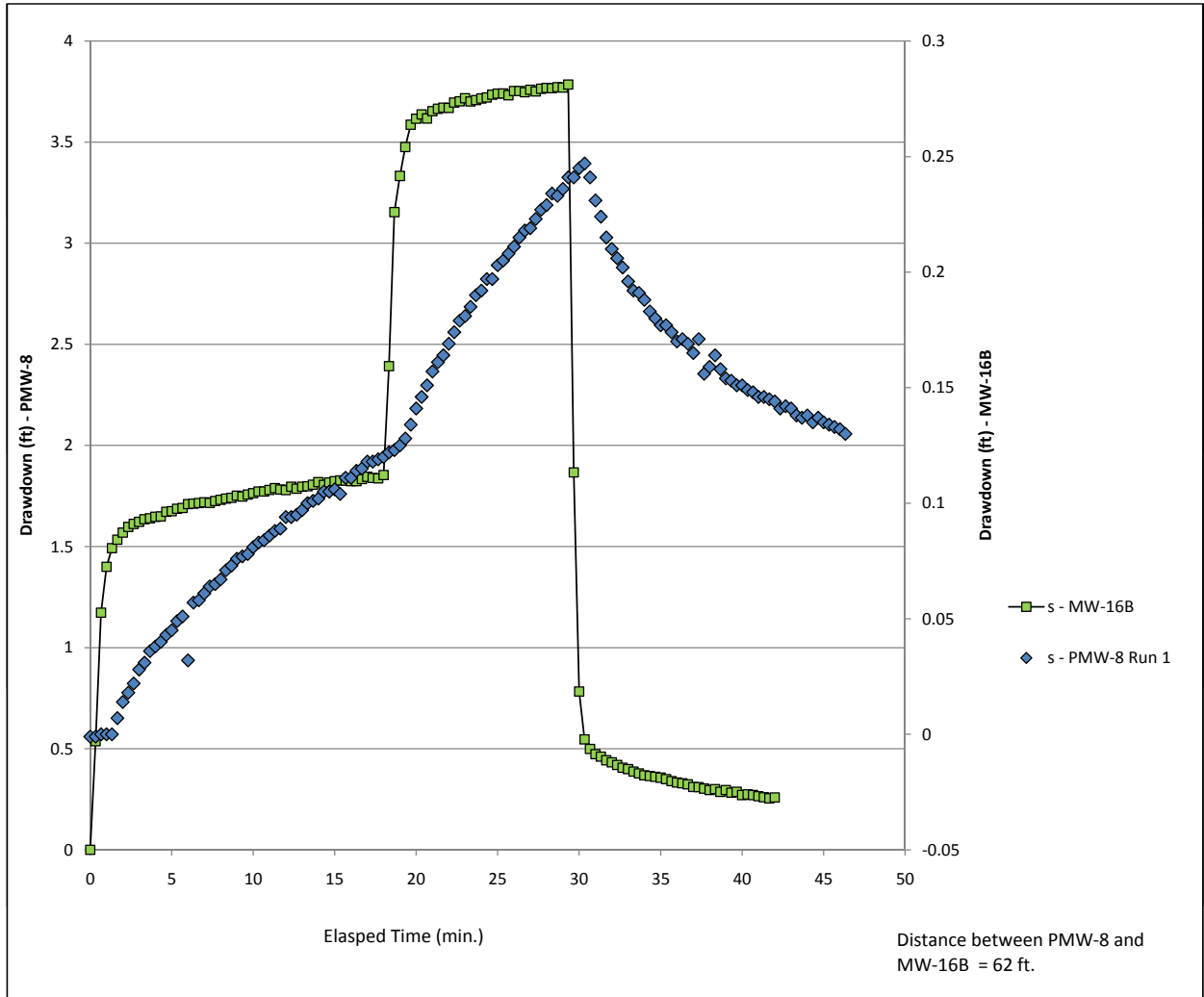
		Date Started : 9/18/2009	BORING/WELL PMW-9	
		Date Completed : 10/2/2009	(Page 1 of 1)	
Hyde Park Pilot Test Niagara Falls, New York		Drilling Method : 6 1/4" ID HSA/HQ Coring	PID Model : MiniRay	
Atlantic Richfield (Former Carborundum Plant)		Sampling Method : Split-Spoon/Core	PID Calibration : 100 ppm Isobutylene	
September 2008		Drilling Firm : NORTHCOAST DRLG		
		Lead Driller : Geologist : B. Adams		
		Project Manager : Mark Raybuck		
		Reviewed By : B. Adams		
		Regulatory Agency : NYSDEC		

Depth in feet	Surf. Elev.	DESCRIPTION	USCS	GRAPHIC	PID-ppm	Recovery Inches	Blow Count
0		Limestone gravel FILL.					
1					0.0	NA	HAND
2			AR				
3					0.0	NA	HAND
4							
5		Dry, brown and black CLAY, some silt, firm.	CL		0.0	NA	HAND
6							
7		Reddish brown SILT, soft to firm, damp, no staining or odors.	ML		0.0	16	3-5-7
8							
9		Same as above, firm, damp, trace rounded gravel.	ML		0.0	19	3-6-8-6
10							
11		Reddish-brown SILT, trace dolomite gravel, trace fine sand, soft, moist, no staining or odors.	ML		0.0	16	1-2-3-3
12							
13		Brown CLAY, stiff, some fine to medium dolomite gravel, no staining or odors.	CL		0.0	7	8-10-13-14
14							
15		Poor recovery, dark grey SAND, some dolomite gravel.	SW		0.0	2	25-44-50/4"
16							
17		Poor recovery, same as above (wet).	SW		0.0	1	47-35-32-45
18							
19		Reddish-brown, fine-graded, SAND and SILT, wet, no staining or odors.	SW-ML		0.0	15	WOH-3-5-9
20							
21		Dark grey, dolomite cobbles, trace sand, wet.	GP		0.0	6	45-50/5"
22							
23		Dark grey DOLOMITE bedrock.	DO		NA	NA	50/4"
24		Auger refusal at 23 feet. Drill socket into bedrock with rollerbit from 23 to 25 feet.	DO		0.0	0.5	ROLLER
25							
26		Advanced first core run (25'-29') using 3 5/8" core. RQD = 75%. Hard DOLOMITE bedrock.					
27			DO		0.0	48" of 48"	HQ Core
28							
29		RQD = 38%	DO				
30		CLAY layer.	CL				
31		Hard DOLOMITE bedrock. Run #2 - 29'-33'					
32			DO		NA	48" of 48"	HQ Core
33							
34							



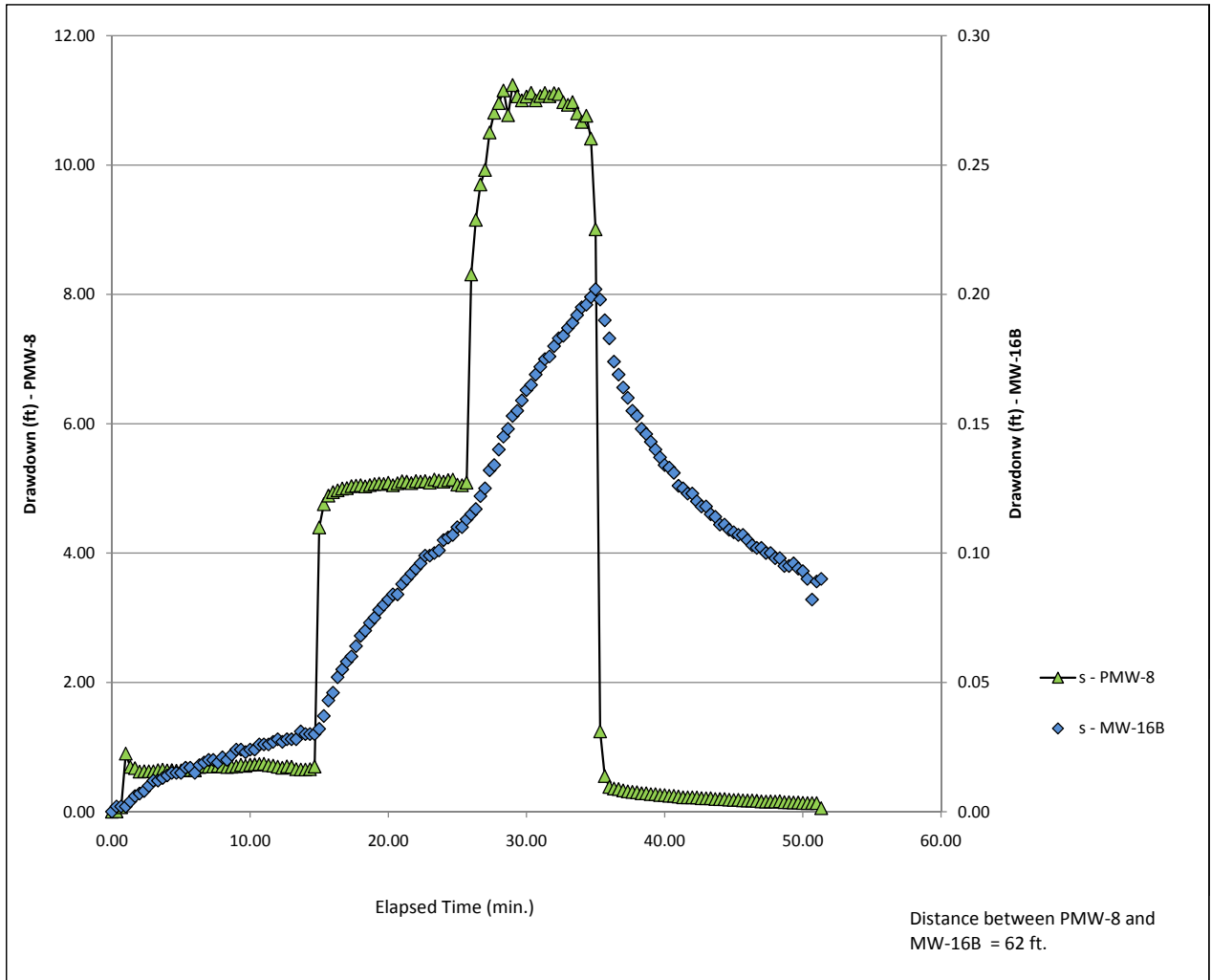
Monitoring Well Construction Information	
CONSTRUCTION	
Boring Diameter	: ~10" O.D. upper, ~6" lower
WELL RISER	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
WELL SCREEN	
Material	: Stainless Steel
Diameter	: 4-Inch
Joints	: Threaded
Opening Length	: 0.01-inch slots
Length	: 8-feet
SAND PACK	
Material	: #2 Silica Filter Sand
SEAL	
Material	: Bentonite Pellets
GROUT	
Material	: Cement-Bentonite
WELL HEAD	
Protection	: Bolt Down Flush Cover
Well Cap	: Expandable Plug
Well Pad	: 2'x2'x8"

APPENDIX B
HYDRAULIC TESTS



Flow rates:
 Step 1 = 5.0
 Step 2 = 8.1

APPENDIX B
FORMER CARBORUNDUM COMPANY ELECTRIC PRODUCTS DIVISION TOWN OF NIAGARA, NY OVERBURDEN PILOT TEST
PACKER TEST RESULTS FOR PMW-8 (RUN 1)
PARSONS
40 La Riviere Dr., Suite 350, Buffalo NY 14222



Flow rates:
 Step 1 = 1.3
 Step 2 = 5
 Step 3 = 8.1

APPENDIX B
FORMER CARBORUNDUM COMPANY ELECTRIC PRODUCTS DIVISION TOWN OF NIAGARA, NY OVERBURDEN PILOT TEST
PACKER TEST RESULTS FOR PMW-8 (RUN 2)
PARSONS
40 La Riviere Dr., Suite 350, Buffalo NY 14222

Project # 445335

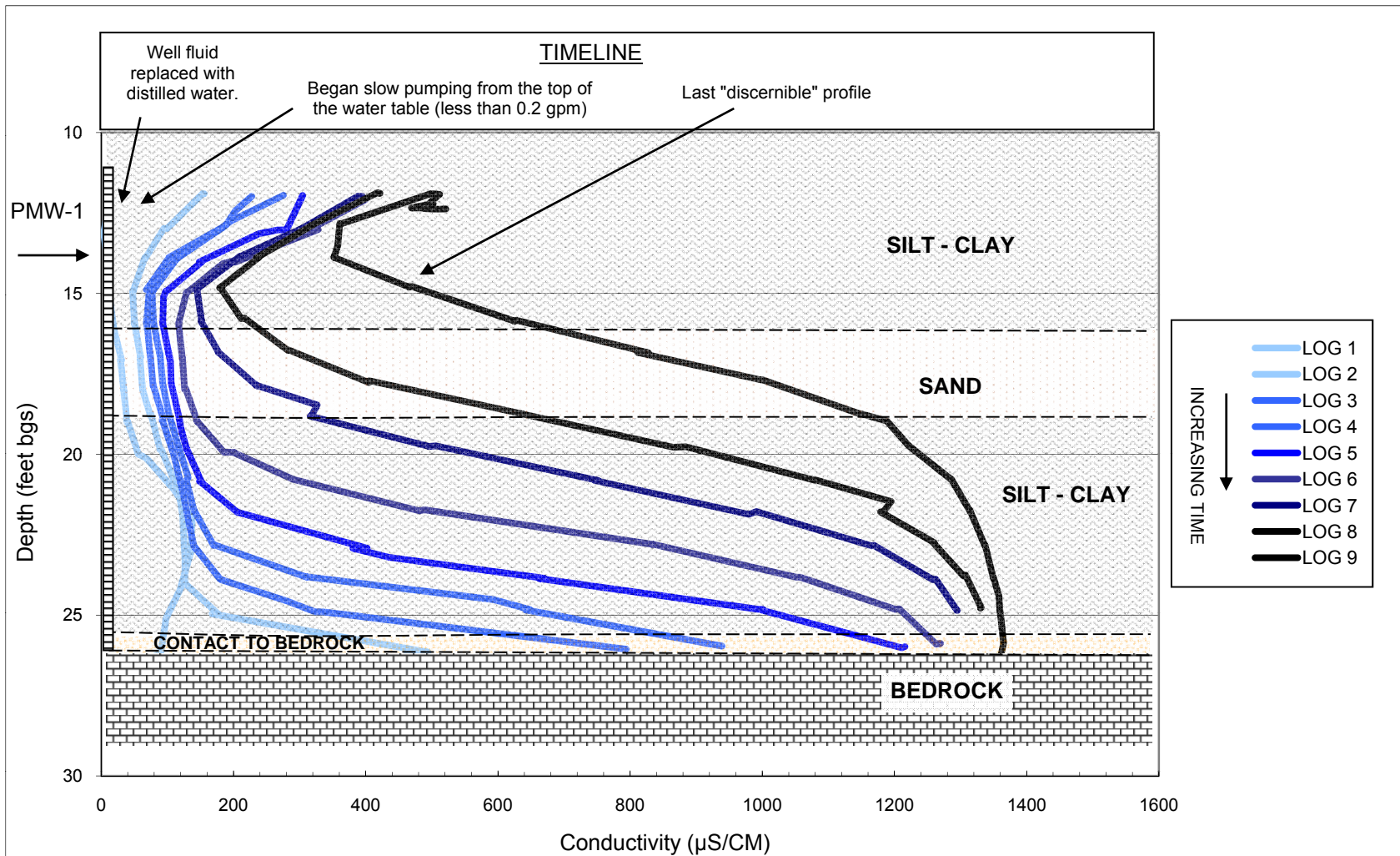
Site: Hyde Park

Description of the well fluid replacement test

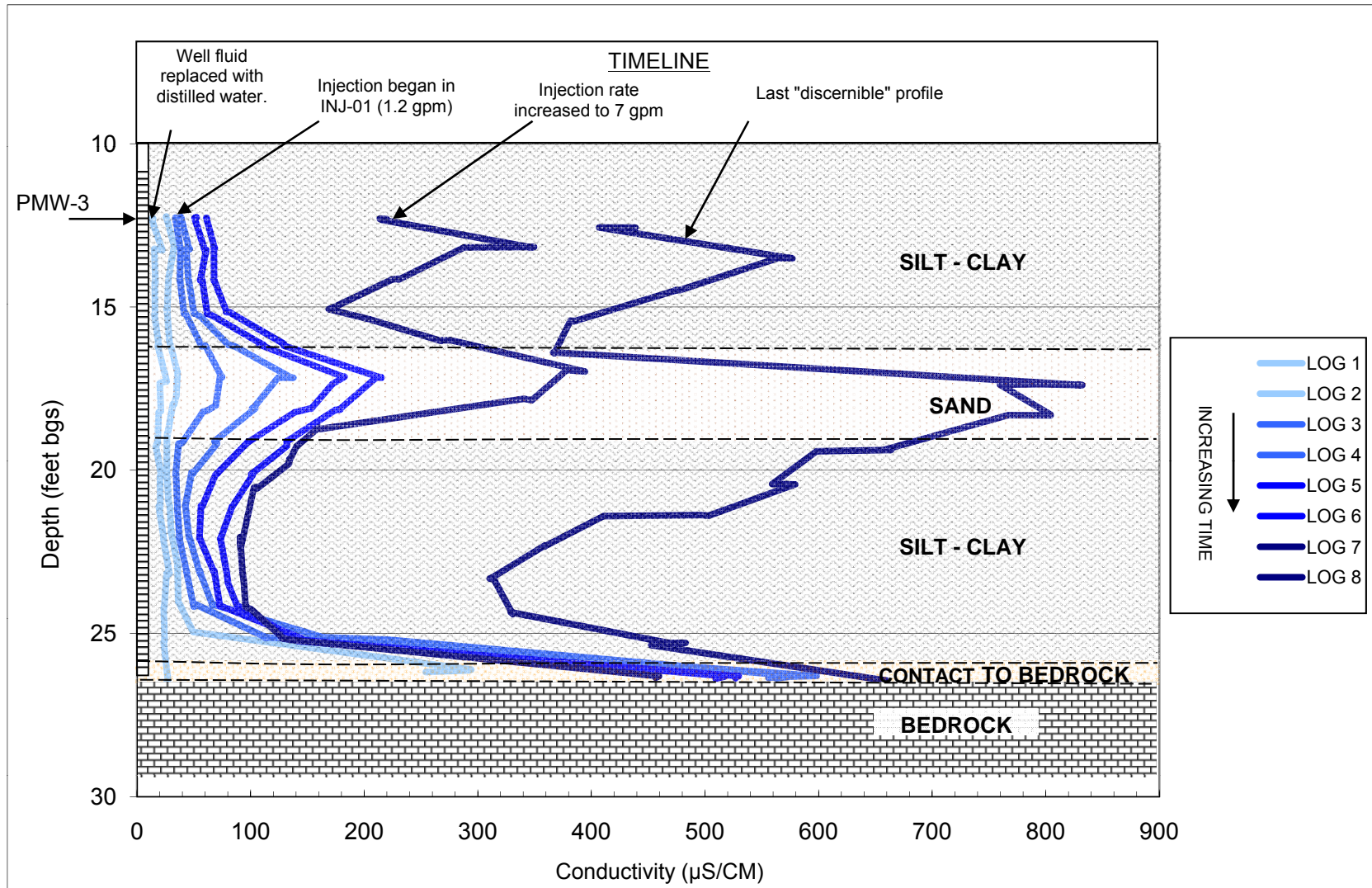
The following is a short list of the procedures followed to complete the well fluid replacement tests.

- A sampling tubing was lowered to approximately one foot above the bottom of the well (lower tube).
- A second sampling tube was lowered to one foot below the water table (upper tube)
- A conductivity probe was lowered into the well and well water profile measurements were taken every one foot of the water column in the well. Three baseline profiles were conducted.
- A peristaltic pump was connected to lower tube.
- Distilled water was slowly poured into the well, while simultaneously pumping water from the lower tube. A water level meter was used to measure the water level in the well. Distilled water was added to the well at approximately the same rate as water was pumped from the bottom of the well. This was confirmed by measuring the water level in the well, and keeping the water level at approximately the same level as the static water level.
- Addition of distilled water was continued until the specific conductivity was lowered to approximately 50 $\mu\text{S}/\text{cm}$, thereby replacing the groundwater with distilled water.
- Conductivity profiles were conducted measuring specific conductivity every 1 foot of the water column.
- The substrate injection was started at the injection well.
- Approximately every ten to fifteen minutes a small (less than 300 ml) volume of water was withdrawn from the upper tube at a low flow rate (less than 200 ml) in order to promote groundwater flowing through the well and limit flow around the well.
- Conductivity profiles were conducted until the water column in the well was approximately 60% of the conductivity of the substrate.

WELL FLUID REPLACEMENT TEST - PMW-1 CONDUCTIVITY PROFILES AND GEOLOGY



WELL FLUID REPLACEMENT TEST - PMW-3 CONDUCTIVITY PROFILES AND GEOLOGY



APPENDIX C
GEOPHYSICAL REPORT



**Final Report
Televiewer, Geophysical, and Flowmeter Logging
Three Wells (INJ-03, PMW-6, and PMW-9)
Niagara, NY
MAG Project Number 080936**

**Prepared For: Parsons Commercial Technology Group
Prepared By: Mid-Atlantic Geosciences
October 25, 2009**





October 25, 2009

Mr. Ben Mills
Senior Buyer
Parsons Commercial Technology Group
8000 Centre Park Drive
Suite 200
Austin, TX 78729

RE: Televiwer, Geophysical, and Flowmeter Logging
Three Wells (INJ-03, PMW-6, and PMW-9)
Niagara, NY
MAG Project Number 080936

Dear Mr. Mills:

Pursuant to our proposal dated August 24, 2009, Mid-Atlantic Geosciences (MAG – the borehole logging division of Enviroscan, Inc.) completed the above-referenced survey on September 30, 2009. The objective of the survey was to identify hydraulically conductive fractures/fracture zones intersecting the well and characterize their orientations. To accomplish these objectives, MAG conducted Fluid Temperature, Fluid Conductivity, Natural Gamma, 3-Arm Caliper, and Acoustic Televiwer logging in the wells.

Logging Equipment

Mid-Atlantic Geosciences conducts borehole geophysics, televiwer, and video logging using a Robertson Geologging, Ltd. Videologger 2000. This unit records digital data for on-site log playback, reproduction, and field interpretation, as well as post-processing and report presentation. The system operates in a Windows 98 environment under four data capture and processing programs: RG-Winlogger, RG-Viewlog, HRAT (for *High-Resolution Acoustic Televiwer*), and OPTV (for *OPTical TeleViewer*). The software provides a comprehensive library of programs for field operations including logging data acquisition, log replay, probe control, probe calibration, and logging environment compensation. Video data (if collected) are recorded in real time to the hard drive of a DVD player/recorder, and can be burned in the field to a DVD that is left with the client's on-site representative.



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All of the logging instruments are permanently mounted in a dedicated Ford F350 or Dodge RAM2500 enclosed-bed truck, each with a self-contained power supply, and support and decontamination equipment. The downhole probes or sondes are connected to either a Robertson Geologging Smartwinch with approximately 600 feet of 0.375-inch coaxial cable, or a Robertson 2000m winch with approximately 3000 feet of 0.25-inch coaxial cable – depending on the depth of the wells logged.

Logging Parameters and Methodology

Geophysical well logging in general involves lowering sondes in a borehole and recording parameters that are related to the properties of the adjacent soil or rock, the fluids in the borehole or formation, and/or construction details of the well. There are many tools and techniques that have been developed to provide specific information in different environments and constructions of drilled holes. The data collected can define the nature and extent of geologic formations and formation fluids, and can be used to provide correlation between holes.

The sondes used for this survey are described below. Note that before any of these tools are put into service for a particular job, MAG personnel test them for proper function and recalibrate as necessary. This is essential to the proper acquisition of downhole data and the ability to relate the data from one borehole to another.

Fluid Temperature

Fluid temperature logs provide the temperature of the air or fluid in a borehole as a function of depth. Temperature logs can indicate where water is entering or leaving a borehole – and thereby disturbing the normal geothermal gradient. Deviations, offsets, or changes in the slope of the temperature log can be used to locate zones of water movement within the borehole. Temperature logs must be run in wells that have been allowed to fully equilibrate to the local geothermal gradient following any prior drilling, construction, pumping or sampling. During a temperature survey, data accuracy is ensured by maintaining a downward logging speed of approximately 10 feet per minute (fpm). This provides an adequate time buffer to allow sensors to respond to minor temperature changes.

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Fluid Conductivity

Fluid conductivity logs provide a continuous measurement of the electrical conductivity of the borehole fluid – i.e. zero in air or hydrocarbons, greater than zero in water. In water, electrical conductivity is mostly a function of electrolytic content. Water with very low dissolved solid concentrations will yield low fluid conductivity, while water containing a high level of dissolved solids will be proportionally more conductive. Fluid conductivity logs often deflect where water-producing features are transmitting water into or out of the well (since the well water may have a differing electrolytic chemistry than the formation water). The fluid conductivity log is usually collected simultaneously with the temperature log – since for both, data from a fully equilibrated water column is required.

Natural Gamma

Gamma logs are one of the most widely used geophysical logs in groundwater applications. They are used primarily to identify changes in lithology – specifically the relative amounts of clay in various sedimentary units.

A gamma log provides a record of the total natural gamma radiation detected within a given energy range. In water-bearing rocks and sediments that are not contaminated by artificial radioisotopes, the most significant naturally-occurring, gamma-emitting radioisotopes are potassium-40 and the daughter products of the uranium and thorium decay series. If gamma-emitting artificial radioisotopes have been introduced by humans into the groundwater system, they will also produce part of the radiation measured.

The amplitude of gamma-log deflections is affected by any borehole condition that alters the density of the material through which gamma photons must pass or the length of the travel path. The bedding of a gamma-emitting formation must be thick to obtain a quantitative value since the detector will be affected by the radiation from the formation as the tool approaches and passes the bed. Although increases in borehole diameter or the presence of steel casing will decrease the recorded gamma count, it is possible to collect usable information in both cased and open portions of the borehole using the gamma sonde. The presence of potassium-rich (and therefore gamma-emitting) bentonite clay commonly used in well construction will generally produce high gamma count peaks on a natural gamma log. MAG has natural gamma detectors on many sondes, and comparison of the multiple gamma logs collected for any given well logging program are used to ensure that the depths of differing logs are not erroneously shifted. Therefore, the gamma log presented for any well may have been collected simultaneously with any of the other logs from the same well.

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Caliper

Caliper measurements represent the average diameter of the borehole or well at a given depth. The caliper tool collects and transmits the data from three spring-loaded arms as the tool is lifted upwards through the borehole. The caliper tool is used to locate solution openings or fractures (where the borehole is typically enlarged due either to the presence of natural openings, or to plucking of broken rock by the drill bit), and to determine the length of casing intervals (as evident from small changes in casing diameter, or the small enlargements at threaded junctions, or narrowing due to the bead at welded junctions).

Caliper logs are collected by calibrating the downhole tool with a measuring template, lowering the tool to the base of the well, remotely opening the arms, and then logging the open borehole and casing diameter in an upward direction. Caliper logs are acquired with a logging speed of no more than 12 feet per minute.

Acoustic Televiewer

The HRAT provides a high-resolution digital acoustic scan of the interior of a borehole using visible ultrasonic pulses. Since ultrasonic pulses are used, it is possible to record both the amplitude and travel time of each pulse, and construct two separate images. The amplitude log is analogous to a visual or optical televiewer log, while the travel time data are affected primarily by the local diameter of the borehole (i.e. the larger the bore, the later the arrival of the reflected pulse), and therefore supplement the caliper log (described below). From the accurately-scaled, continuous image it is possible to identify the depth and character of features such as fractures, bedding planes, veins, solution openings, etc. In particular, it is possible to calculate the strike and dip of planar features. The HRAT operates by using a fixed acoustic transducer and a rotating acoustic mirror capable of focusing on the borehole wall at any distance from the probe diameter upwards. The acoustic transducer is focused based on the borehole diameter, and impedance-matched to the borehole fluid to provide optimum image resolution and reflected amplitude. Mirror rotation speed (i.e. circumferential resolution), sampling rate (i.e. depth resolution), signal gain (i.e. amplitude image contrast), and recording time gate (i.e. travel time image contrast) are all variable and under operator control to provide the best image possible under borehole-specific conditions. The image is rectangular – representing the interior of a cylinder that has been sliced open and rolled-out flat. The image is oriented to north based on data from three magnetometers and accelerometers in the sonde. Note that the use of magnetometers for orientation leads to image distortion in steel-cased holes, and within several feet of the base of steel casing in open holes. All HRAT sondes require an open, fluid-filled borehole. Unlike for Optical Televiewer logging, clarity of the fluid is not necessary for HRAT logging.

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Planar features intersecting a cylindrical borehole appear sinusoidal on the flattened cylindrical image. The azimuth of the peak/trough of the sinusoid, and the amplitude of the sinusoid can be measured and used to calculate the strike and dip (see Appendix A) of such features. Based on their visual character, planar features on the HRAT logs have been categorized on the log sheets as various types of geologic interface (fractures, bedding planes, veins, etc.). Features observed on an optical televiewer log can also be characterized based on the Paillet Ranking System developed by the US Geological Survey, Water Resources Division, Borehole Geophysics Research Project. This system is a semi-subjective evaluation of permeability potential. The ranking system assigns a number value from zero to five to observed features. A rank of zero indicates a feature that appears sealed – with no water likely passing through it. Note that the geologic classification of features (e.g. bedding plane, lithologic contact, joint, fracture, foliation, etc.) is not specified in the Paillet System since only water-bearing potential is considered. A rank of five corresponds to a grossly porous zone with large openings (e.g. a major fracture, fault or solution cavity). The ranking system, with examples, is provided in Appendix B. While it was developed for optical televiewer data, it can be used to grossly categorize HRAT features as well.

Tables listing the depth, aperture, strike, dip and type of feature are included in this report, for each well, as Appendix C. Note that because of the subjectivity involved in Paillet ranking, MAG has listed fractures in Appendix C only as either open or sealed. Specific Paillet rankings can be assigned by the client, if desired, by comparing the standard pictures in Appendix B to the HRAT log. Note however, that it has been the experience of MAG that the aperture or Paillet rank of a feature is not always a strong indicator of its water producing potential. Thin, discrete features sometimes produce as much or more water (as evidence by flowmeter logging – see below) than wide, open fractures or fracture zones.

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Logging Results

Wells INJ-03, PMW-6, and PMW-9 were logged on September 30, 2009. As specified in the proposal, MAG logged the borehole with the Fluid Temperature, Fluid Conductivity, Natural Gamma, 3-Arm Caliper, and Acoustic Televiwer sondes. The logging results for the wells are presented on the enclosed digital logs.

Note that since analysis of borehole geophysical logs can be quite subjective, and the level of detail is dependent upon the specific goals of the geologist, the analysis by MAG below covers the major features of each log, as well as some possibly minor features to serve as examples or guides for further interpretation by geologists familiar with the site, local geology, and/or project goals. In general, logs may display deviations (i.e. "spikes" where the parameter deviates from, and then returns to, "background" level), offsets (changes in background level), or slope changes. Any of these could be considered significant in certain situations, or when compared to correlating features at the same depth on other logs. If there are any questions about the features discussed (or not discussed) below, please do not hesitate to contact MAG.

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INJ-03

Noted Features

- The total depth (TD) of the well is approximately 31.8 feet below top of casing (BTOC).
- The depth to water (DTW) was 6 feet BTOC at the time of the survey.
- The diameter of the casing at the surface was measured to be four inches, and the bottom of the casing (BOC) was located at approximately 25.5 feet BTOC.
- The caliper (borehole diameter) log reveals only minor fluctuations throughout the borehole correlating with planar features.
- The fluid temperature log shows offsets located at approximately 8.5, 16.1 and 27.1 feet BTOC.
- The fluid conductivity log shows an offset located at approximately 27.7 feet BTOC.
- The natural gamma response shows only minor fluctuations throughout the well.
- Numerous planar features were recognizable on the televiewer log. The depth, strike, dip, aperture, and feature type are listed on the log, as well as on the accompanying table in Appendix C.

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PMW-6

Noted Features

- The total depth (TD) of the well is approximately 31.6 feet below top of casing (BTOC).
- The depth to water (DTW) was 5.6 feet BTOC at the time of the survey.
- The diameter of the casing at the surface was measured to be four inches, and the bottom of the casing (BOC) was located at approximately 25.9 feet BTOC.
- The caliper (borehole diameter) log reveals only one major fluctuation located at approximately 28.5 feet BTOC and minor fluctuations throughout the borehole correlating with planar features.
- The fluid temperature log shows offsets located at approximately 8 and 13.4 feet BTOC.
- The fluid conductivity log shows an offset located at approximately 25.8 feet BTOC.
- The natural gamma response shows only minor fluctuations throughout the well.
- Numerous planar features were recognizable on the televiewer log. The depth, strike, dip, aperture, and feature type are listed on the log, as well as on the accompanying table in Appendix C.

Mr. Mills
October 25, 2009
Page 9

PMW-9

Noted Features

- The total depth (TD) of the well is approximately 31.7 feet below top of casing (BTOC).
- The depth to water (DTW) was 5.9 feet BTOC at the time of the survey.
- The diameter of the casing at the surface was measured to be four inches, and the bottom of the casing (BOC) was located at approximately 23.8 feet BGS.
- The caliper (borehole diameter) log reveals only minor fluctuations throughout the borehole correlating with planar features.
- The fluid temperature log shows offsets located at approximately 8.1, 18.4, and 23.5 feet BTOC.
- The fluid conductivity log shows offsets located at approximately 10.1 and 23.9 feet BTOC.
- The natural gamma response shows only minor fluctuations throughout the well.
- Numerous planar features were recognizable on the televiewer log. The depth, strike, dip, aperture, and feature type are listed on the log, as well as on the accompanying table in Appendix C.

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Limitations

In making verbal or written interpretation of logs, MAG personnel give the client the benefit of their best professional judgment. However, since all interpretations are based on inference from electrical, magnetic, or other indirect measurements, MAG does not, and cannot, guarantee the accuracy or the correctness of any such interpretations. MAG shall not be liable for any loss, damages, or expenses resulting from reliance on such interpretations. MAG does not warrant the accuracy of log data transmitted by any electronic process and will not be responsible for intentional interpretation of log data by others. MAG makes no warranties – neither explicit nor implied. Under no circumstances shall MAG, its parent company Enviroscan, Inc., or their personnel be liable for consequential damages.

We appreciate this opportunity to have worked with you. If you have any questions, please do not hesitate to contact me.

Sincerely,
Mid-Atlantic Geosciences



Duro Rajkovic
Project Geophysicist

Technical Review By:
Mid-Atlantic Geosciences



Felicia Kegel Bechtel, M.Sc., P.G.
President

enc.: INJ-03: Televiewer and Geophysical Logs
PMW-6: Televiewer and Geophysical Logs
PMW-9: Televiewer and Geophysical Logs
Appendix A: Planar Feature Orientation Parameters
Appendix B: The Paillet Ranking System
Appendix C: Planar Feature Characterizations Tables



Mid-Atlantic Geosciences

Title: *Televiwer and Geophysical Logs*

WELL ID

INJ-03

Logging Date: 09.30.2009

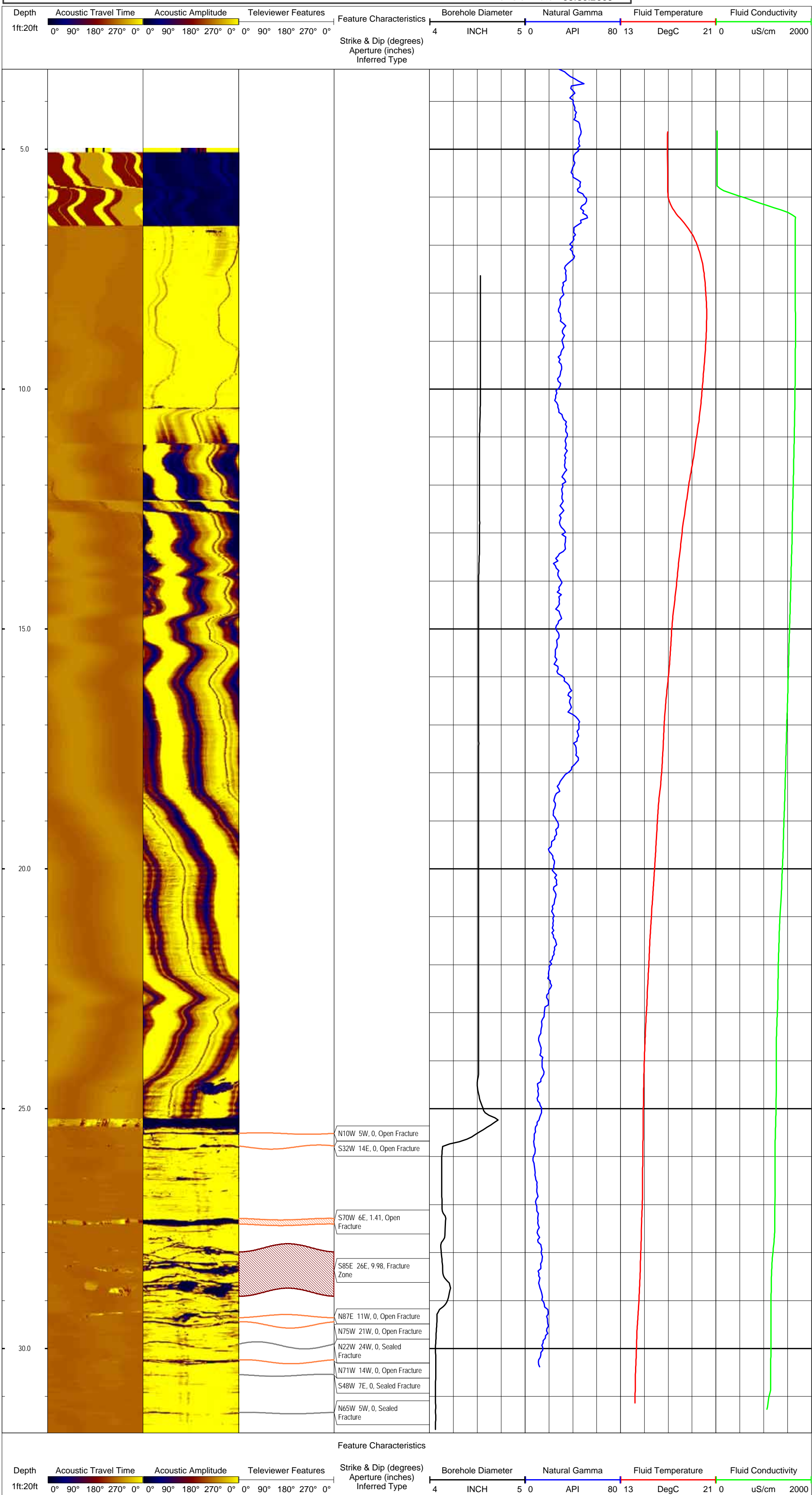
Logging Datum: TOC

BOC: 25.5' DTW: 6' TD: 31.8'

Site Name: 3424 Hyde Park Boulevard
Location: Niagara, NY

Client: Parsons
Project No.: 080936

Revision Date: 09.30.2009





Mid-Atlantic Geosciences

Title: *Televiwer and Geophysical Logs*

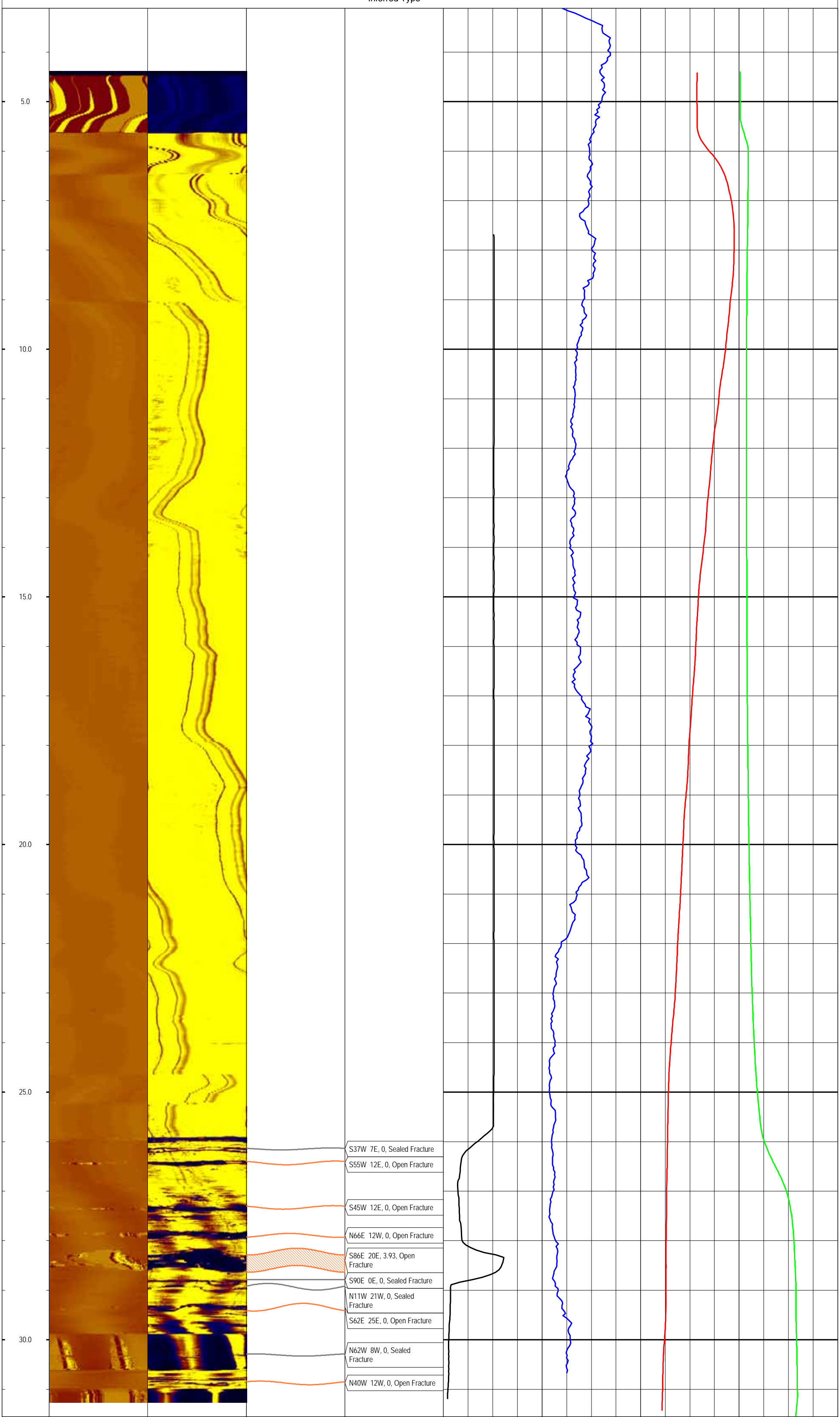
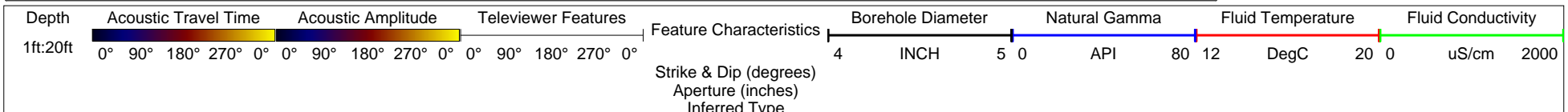
WELL ID
PMW-6

Logging Date: *10.01.2009*
Logging Datum: *TOC*
BOC: *25.9'* DTW: *5.6'* TD: *31.6'*

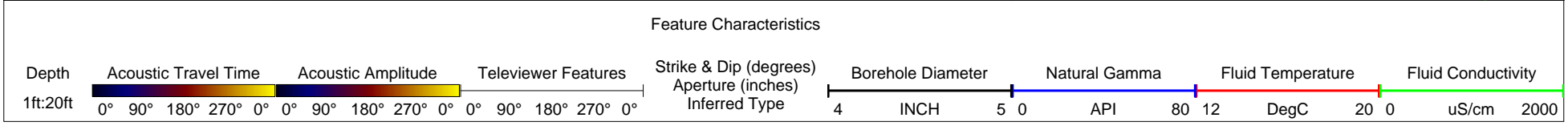
Site Name: *3424 Hyde Park Boulevard*
Location: *Niagara, NY*

Client: *Parsons*
Project No.: *080936*

Revision Date: *10.01.2009*



- S37W 7E, 0, Sealed Fracture
- S55W 12E, 0, Open Fracture
- S45W 12E, 0, Open Fracture
- N66E 12W, 0, Open Fracture
- S86E 20E, 3.93, Open Fracture
- S90E 0E, 0, Sealed Fracture
- N11W 21W, 0, Sealed Fracture
- S62E 25E, 0, Open Fracture
- N42W 8W, 0, Sealed Fracture
- N40W 12W, 0, Open Fracture





Mid-Atlantic Geosciences

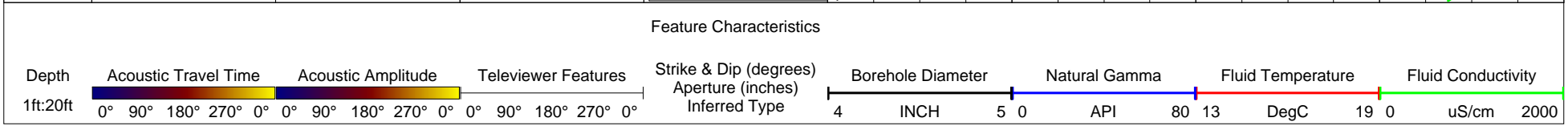
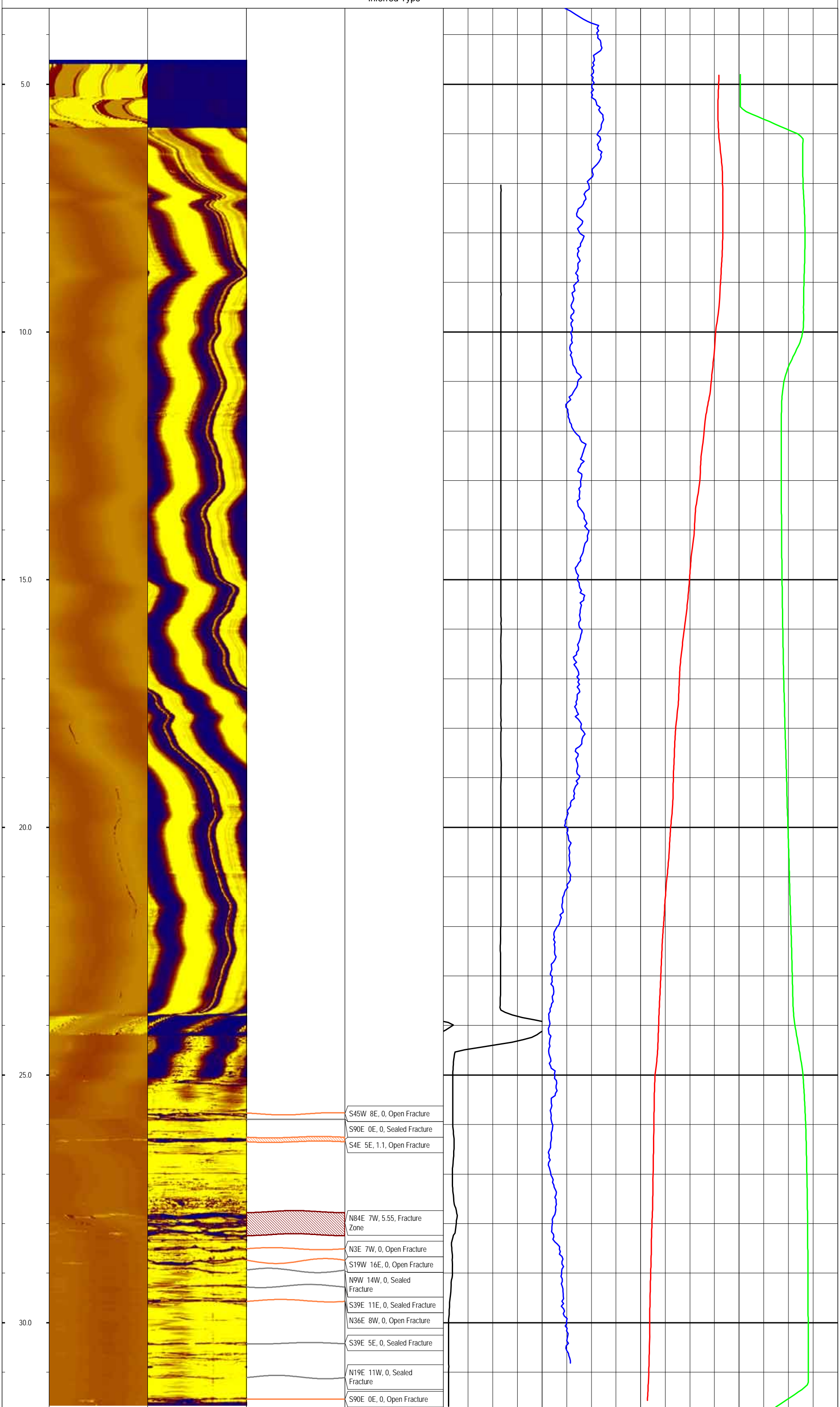
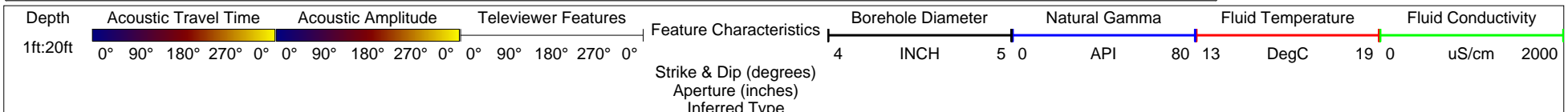
WELL ID
PMW-9

Logging Date: 10.01.2009
Logging Datum: TOC
BOC: 23.8' DTW: 5.9' TD: 31.7'

Revision Date: 10.01.2009

Site Name: 3424 Hyde Park Boulevard
Location: Niagara, NY

Client: Parsons
Project No.: 080936



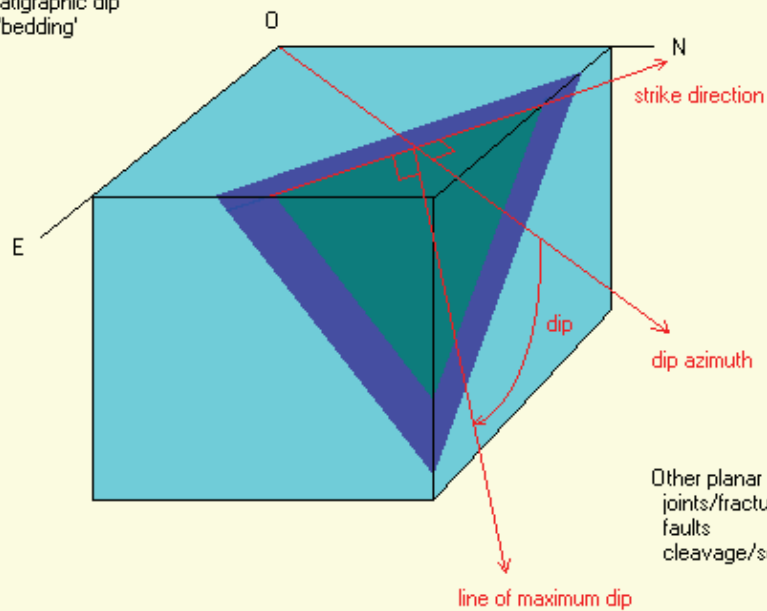
Appendix A

Planar Feature Orientation Parameters

Planar Feature Orientation Parameters

Dip = angle of inclination of the plane, downwards from the horizontal
Dip azimuth = azimuth of the line of maximum dip in the plane, clockwise from North
Strike direction = azimuth of a horizontal line in the plane (= dip azimuth - 90°)
e.g. dip and dip azimuth = 60° N041° or strike and dip = N311° 60°

e.g. Stratigraphic dip
or 'bedding'









Other planar geologic features include
joints/fractures/veins
faults
cleavage/schistosity

Appendix B

Paillet Ranking System

Paillet Ranking System

Example OPTV Feature	Paillet Rank	Description
	0	Sealed feature – no flow
	1	Partial open fracture
	2	Continuous open fracture
	3	Wide open fracture or fractures
	4	Very wide fracture or multiple interconnected fractures
	5	Major fracture zone or breakout

Appendix C

Planar Feature Characterizations Tables

Mid-Atlantic Geosciences Planar Feature Characterizations



Well ID: INJ-03
Client: Parsons
Site Name: 3424 Hyde Park Boule
Project No.: 080936
Location: Niagara, NY
Revision Date: 09.20.2009

Depth (ft.)	Aperture (in.)	Dip Azimuth (deg.)	Strike (deg.)	Dip (deg.)	Feature Type
25.5	0.0	260	N10W	5W	Open Fracture
25.8	0.0	122	S32W	14E	Open Fracture
27.4	1.4	160	S70W	6E	Open Fracture
28.4	10.0	5	S85E	26E	Fracture Zone
29.3	0.0	357	N87E	11W	Open Fracture
29.5	0.0	195	N75W	21W	Open Fracture
29.9	0.0	248	N22W	24W	Sealed Fracture
30.3	0.0	199	N71W	14W	Open Fracture
30.6	0.0	138	S48W	7E	Sealed Fracture
31.3	0.0	205	N65W	5W	Sealed Fracture

Mid-Atlantic Geosciences Planar Feature Characterizations



Well ID: PMW-6
Client: Parsons
Site Name: 3424 Hyde Park Boule
Project No.: 080936
Location: Niagara, NY
Revision Date: 10.01.2009

Depth (ft.)	Aperture (in.)	Dip Azimuth (deg.)	Strike (deg.)	Dip (deg.)	Feature Type
26.2	0.0	127	S37W	7E	Sealed Fracture
26.4	0.0	145	S55W	12E	Open Fracture
27.3	0.0	135	S45W	12E	Open Fracture
27.9	0.0	336	N66E	12W	Open Fracture
28.4	3.9	4	S86E	20E	Open Fracture
28.8	0.0	0	S90E	0E	Sealed Fracture
28.9	0.0	259	N11W	21W	Sealed Fracture
29.3	0.0	28	S62E	25E	Open Fracture
30.3	0.0	208	N62W	8W	Sealed Fracture
30.9	0.0	230	N40W	12W	Open Fracture

**Mid-Atlantic Geosciences
Planar Feature Characterizations**



Well ID: **PMW-9** Client: **Parsons**
 Site Name: **3424 Hyde Park Boule** Project No.: **080936**
 Location: **Niagara, NY** Revision Date: **10.01.2009**

Depth (ft.)	Aperture (in.)	Dip Azimuth (deg.)	Strike (deg.)	Dip (deg.)	Feature Type
25.8	0.0	135	S45W	8E	Open Fracture
25.9	0.0	0	S90E	0E	Sealed Fracture
26.3	1.1	86	S4E	5E	Open Fracture
28.0	5.6	354	N84E	7W	Fracture Zone
28.5	0.0	273	N3E	7W	Open Fracture
28.8	0.0	109	S19W	16E	Open Fracture
29.0	0.0	261	N9W	14W	Sealed Fracture
29.3	0.0	51	S39E	11E	Sealed Fracture
29.6	0.0	306	N36E	8W	Open Fracture
30.4	0.0	51	S39E	5E	Sealed Fracture
31.1	0.0	289	N19E	11W	Sealed Fracture
31.5	0.0	0	S90E	0E	Open Fracture

APPENDIX D

LOW-FLOW GROUNDWATER SAMPLING SHEETS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7A

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-16:50

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
16:50	9.04	200.00	0.00								
16:55		200.00	0.30	7.01	0.00	13.70	1.600	13.59	1.00	-332	
17:00	10.84	200.00	0.60	6.99	0.00	6.23	1.590	13.67	1.00	-333	
17:05		200.00	0.90	6.95	0.00	1.42	1.570	13.55	1.00	-340	
17:10	11.10	200.00	1.20	6.93	0.00	1.31	1.570	13.52	1.00	-342	
17:15		200.00	1.50	6.91	0.00	0.62	1.570	13.45	1.00	-343	
17:20	11.16	200.00	1.80	6.90	0.00	0.32	1.560	13.42	1.00	-344	
17:25		200.00	2.10	6.89	0.00	0.30	1.550	13.39	1.00	-340	
17:30	11.36	200.00	2.40	6.89	0.00	0.26	1.550	13.35	1.00	-340	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-17:45

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.89	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	1.55	Manganese	0.00
Turbidity (NTU)	0.26	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	432.00
Temp.(°C)	13.35	Hydrogen Sulfide	1.70
TDS (g/L)	1.00	Alkalinty	538.00
ORP (mv)	-340.00	*NOTE* HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7B

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-17:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
8.36

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
17:00	8.36	260.00		7.18	1.05	86.00	1.810	11.26	1.20	-335	
17:10		260.00		6.89	0.00		1.860	12.13	1.20	-365	
17:15	9.30	260.00	1.00	6.88	0.00	40.00	1.790	11.96	1.10	-368	
17:25	9.36	260.00	1.40	6.85	0.00	27.00	1.790	11.91	1.10	-363	
17:30		260.00	1.80	6.84	0.00	12.00	1.780	11.88	1.10	-362	
17:35	9.40	260.00	2.20	6.84	0.00	8.80	1.780	11.86	1.10	-360	
17:40		260.00	2.60	6.84	0.00	7.30	1.780	11.87	1.10	-359	
17:45	9.42	260.00	2.90	6.84	0.00	7.10	1.770	11.86	1.10	-358	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/2009 0:00

Total Volume of Water purged: _____

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.84	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.77	Manganese	0.00
Turbidity (NTU)	7.10	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	370.00
Temp.(°C)	11.86	Hydrogen Sulfide	1.85
TDS (g/L)	1.10	Alkalinty	298.00
ORP (mv)	-388.00	*NOTE* HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-10B

Well Diameter: 2 Inches

Samplers: B Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/16/09-09:12

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:12	9.74	200.00	0.00	6.96	0.05	0.75	1.820	13.31	1.20	-85	
9:17		200.00	0.30	6.94	0.00	1.68	1.820	13.31	1.20	-98	
9:22	9.76	200.00	0.60	6.93	0.00	2.44	1.820	13.32	1.20	-107	
9:27		200.00	0.90	6.93	0.00	0.59	1.800	13.38	1.20	-114	
9:32	9.76	200.00	1.20	6.92	0.00	0.19	1.820	13.41	1.20	-115	
9:37		200.00	1.50	6.92	0.00	0.06	1.830	13.37	1.20	-113	
9:42	9.76	200.00	1.80	6.92	0.00	0.29	1.830	13.40	1.20	-113	
9:47		200.00	2.10	6.91	0.00	0.29	1.830	13.32	1.20	-113	
9:52	9.76	200.00	2.40	6.91	0.00	0.23	1.830	13.27	1.20	-113	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/16/09-10:00

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.91	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	1.83	Manganese	0.00
Turbidity (NTU)	0.23	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	926.00
Temp.(°C)	13.27	Hydrogen Sulfide	0.00
TDS (g/L)	1.20	Alkalinty	414.00
ORP (mv)	-113.00	*NOTE* HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-11B

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/13/09-9:15

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
9.2

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:15	9.20	240.00		7.07	0.00	100.00	1.560	11.77	1.00	-169	
9:20		240.00	0.30	6.90	0.00	56.00	1.640	12.09	1.10	-180	
9:25	9.86	240.00	0.60	6.90	0.00	24.00	1.640	12.47	1.10	-191	
9:30		240.00	1.00	6.93	0.00	13.00	1.630	12.90	1.00	-210	
9:35	10.06	240.00	1.40	6.94	0.00	9.90	1.660	13.01	1.10	-216	
9:40		240.00	1.70	6.94	0.00	8.70	1.700	13.04	1.10	-214	
9:45	10.10	240.00	2.10	6.94	0.00	8.40	1.710	12.96	1.10	-216	
9:50		240.00	2.40	6.93	0.00	8.20	1.720	12.76	1.10	-219	
9:55	10.12	240.00	2.70	6.92	0.00	8.00	1.720	12.72	1.10	-222	
10:00	10.13	240.00	3.00	6.92	0.00	7.90	1.730	12.57	1.10	-226	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/13/09-10:05

Total Volume of Water purged: 3 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.92	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.73	Manganese	0.00
Turbidity (NTU)	7.90	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	238.00
Temp.(°C)	12.57	Hydrogen Sulfide	0.50
TDS (g/L)	1.10	Alkalinty	304.00
ORP (mv)	-226.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17A

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/20/2009 0:00

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:08	5.82	200.00	0.00	7.22	2.15	106.40	4.400	15.87	2.80	-102	
8:13		200.00	0.30	6.98	0.00	79.30	4.700	16.35	3.00	-106	
8:18	6.12	200.00	0.60	6.95	0.00	53.90	5.090	16.45	3.20	-108	
8:23		200.00	0.90	6.92	0.00	31.90	5.120	16.58	3.30	-111	
8:28	6.22	200.00	1.30	6.91	0.00	30.70	5.210	15.58	3.30	-113	
8:33		200.00	1.50	6.90	0.00	22.10	5.280	16.58	3.30	-114	
8:38	6.28	200.00	1.80	6.88	0.00	14.40	5.240	16.60	3.30	-115	
8:43		200.00	2.10	6.88	0.00	12.90	5.230	16.62	3.30	-115	
8:48		200.00	2.40	6.88	0.00	9.30	5.240	16.60	3.30	-115	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/20/09-9:05

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.88	Ferrous Iron (mg/L)	2.00
Spec. Cond.(mS/cm)	5.24	Manganese	0.00
Turbidity (NTU)	9.30	Sulfate	200.00
DO (mg/L)	0.00	Carbon Dioxide	356.00
Temp.(°C)	16.60	Hydrogen Sulfide	0.00
TDS (g/L)	3.30	Alkalinty	360.00
ORP (mv)	-115.00	*NOTE* HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17B

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/20/09-10:10

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:10	6.03	200.00	0.00	8.35	1.38	24.20	1.310	15.65	0.90	-159	
10:15		200.00	0.30	7.20	0.00	22.00	3.730	15.57	2.40	-147	
10:20	6.06	200.00	0.60	7.13	0.00	18.20	4.020	15.45	2.60	-155	
10:25		200.00	0.90	7.12	0.00	11.80	4.050	15.44	2.60	-160	
10:30	6.08	200.00	1.20	7.10	0.00	8.00	4.060	15.39	2.60	-164	
10:35		200.00	1.50	7.09	0.00	5.77	4.060	15.33	2.60	-167	
10:40	6.09	200.00	1.80	7.07	0.00	3.77	4.060	15.27	2.60	-172	
10:45		200.00	2.10	7.06	0.00	3.96	4.050	15.25	2.60	-174	
10:50	6.09	200.00	2.40	7.05	0.00	3.24	4.040	15.23	2.60	-175	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/20/09-11:05

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.05	Ferrous Iron (mg/L)	1.40
Spec. Cond.(mS/cm)	4.04	Manganese	0.00
Turbidity (NTU)	3.24	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	318.00
Temp.(°C)	15.23	Hydrogen Sulfide	0.00
TDS (g/L)	2.60	Alkalinty	268.00
ORP (mv)	-175.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: MS-MSD-Dup (Dup labeled MW-170B)

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-1

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-9:47

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:47	8.61	200.00									
9:52		200.00	0.40	6.79	0.20	0.37	1.300	12.89	0.80	-299	
9:57	10.44	200.00	0.80	6.82	0.00	0.85	1.330	13.16	0.90	-311	
10:02		200.00	1.20	6.84	0.00	0.09	1.340	13.14	0.90	-322	
10:07	10.45	200.00	1.60	6.86	0.00	0.06	1.350	13.02	0.90	-335	
10:12		200.00	2.00	6.89	0.00	0.66	1.410	13.06	0.90	-340	
10:17	10.46	200.00	2.40	6.90	0.00	0.32	1.450	13.09	0.90	-345	
10:22		200.00	2.80	6.92	0.00	0.33	1.440	13.06	1.00	-348	
10:27	10.46	200.00	3.20	6.93	0.00	0.13	1.510	13.03	1.00	-351	
10:32		200.00	3.60	6.93	0.00	0.19	1.510	13.03	1.00	-352	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-10:40

Total Volume of Water purged: 3.6 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.93	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.51	Manganese	0.00
Turbidity (NTU)	0.19	Sulfate	150.00
DO (mg/L)	0.00	Carbon Dioxide	346.00
Temp.(°C)	13.03	Hydrogen Sulfide	1.75
TDS (g/L)	1.00	Alkalinty	454.00
ORP (mv)	-352.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-2

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Method: Geopump/Low Flow Date/Time: 10/15/09-11:47

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:47	8.68	200.00									
11:52		200.00	0.30	6.98	3.41	11.90	1.810	13.51	1.20	-163	
11:57	8.91	200.00	0.60	6.97	3.44	6.95	1.810	13.53	1.20	-149	
12:02		200.00	0.90	6.97	3.50	1.09	1.820	13.52	1.20	-128	
12:07	8.92	200.00	1.20	6.96	3.51	0.79	1.810	13.48	1.20	-124	
12:12		200.00	1.50	6.95	3.51	1.12	1.800	13.48	1.20	-120	
12:17	8.93	200.00	1.80	6.96	3.54	0.98	1.790	13.48	1.10	-120	
12:22		200.00	2.10	6.96	3.59	1.16	1.780	13.45	1.10	-124	
12:27	8.94	200.00	2.40	6.96	3.58	0.81	1.770	13.46	1.10	-128	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-12:40

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.96	Ferrous Iron (mg/L)	2.50
Spec. Cond.(mS/cm)	1.77	Manganese	0.00
Turbidity (NTU)	0.81	Sulfate	>200
DO (mg/L)	3.58	Carbon Dioxide	442.00
Temp.(°C)	13.46	Hydrogen Sulfide	0.00
TDS (g/L)	1.10	Alkalinty	490.00
ORP (mv)	-128.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-3

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-14:53

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:53	8.23	200.00	0.00								
14:58		200.00	0.40	6.95	0.00	9.99	1.560	13.08	1.00	-335	
15:03	9.02	200.00	0.80	6.97	0.00	3.93	1.610	12.91	1.00	-337	
15:08		200.00	1.20	6.99	0.00	0.80	1.630	12.88	1.00	-344	
15:13	9.02	200.00	1.60	6.99	0.00	0.28	1.650	12.79	1.10	-351	
15:18		200.00	2.00	6.99	0.00	0.21	1.660	12.68	1.10	-351	
15:23	9.01	200.00	2.40	6.99	0.00	0.30	1.670	12.56	1.10	-350	
15:28		200.00	2.80	6.98	0.00	0.24	1.670	12.47	1.10	-349	
15:33	9.00	200.00	3.20	6.98	0.00	0.23	1.670	12.39	1.10	-349	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-15:50

Total Volume of Water purged: 3.6 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.98	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.67	Manganese	0.00
Turbidity (NTU)	0.23	Sulfate	160.00
DO (mg/L)	0.00	Carbon Dioxide	400.00
Temp.(°C)	12.39	Hydrogen Sulfide	1.85
TDS (g/L)	1.10	Alkalinty	576.00
ORP (mv)	-349.00	*NOTE* HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-4

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-09:55

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
9.5

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:55	9.50	220.00		6.31	0.05	180.00	1.310	11.46	0.80	-85	
10:00		220.00	0.40	6.56	0.00		1.290	12.16	0.80	-11	
10:05	10.04	220.00	0.70	6.65	0.00	100.00	1.370	12.15	0.90	-117	
10:10		220.00	1.10	6.71	0.00		1.430	12.20	0.90	-121	
10:15	10.06	220.00	1.40	6.75	0.00	45.00	1.460	12.16	0.90	-123	
10:20		220.00	1.80	6.77	0.00		1.480	12.17	1.00	-126	
10:25	10.07	220.00	2.20	6.78	0.00	36.00	1.510	12.15	1.00	-128	
10:30	10.08	220.00	2.50	6.79	0.00	22.00	1.520	12.16	1.00	-128	
10:35	10.08	220.00	2.80	6.79	0.00	18.00	1.520	12.12	1.00	-130	
10:40	10.09	220.00	3.20	6.80	0.00	18.00	1.530	12.11	1.00	-131	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-10:50

Total Volume of Water purged: 3.2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.80	Ferrous Iron (mg/L)	1.20
Spec. Cond.(mS/cm)	1.53	Manganese	0.00
Turbidity (NTU)	18.00	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	240.00
Temp.(°C)	12.11	Hydrogen Sulfide	0.00
TDS (g/L)	1.00	Alkalinty	326.00
ORP (mv)	-131.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-5

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/20/09-13:14

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:14	5.78	200.00	0.00	10.33	0.76	7.74	1.440	16.14	0.90	-215	
13:19		200.00	0.30	11.19	0.00	6.50	1.600	15.52	1.00	-252	
13:24	5.79	200.00	0.60	7.62	0.00	0.48	1.740	15.18	1.10	-247	
13:29		200.00	0.90	7.36	0.00	0.06	1.780	15.13	1.10	-253	
13:34	5.80	200.00	1.20	7.32	0.00	0.16	1.800	15.03	1.20	-268	
13:39		200.00	1.50	7.29	0.00	0.46	1.800	15.00	1.20	-271	
13:44	5.80	200.00	1.80	7.27	0.00	0.16	1.800	14.97	1.20	-275	
13:49		200.00	2.10	7.25	0.00	0.98	1.800	14.95	1.20	-277	
13:54	5.80	200.00	2.40	7.26	0.00	0.16	1.800	14.96	1.20	-278	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/20/09-14:00

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.26	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.80	Manganese	0.00
Turbidity (NTU)	0.16	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	294.00
Temp.(°C)	14.96	Hydrogen Sulfide	0.00
TDS (g/L)	1.20	Alkalinty	356.00
ORP (mv)	-278.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-6

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/19/09-12:43

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:43	5.86	200.00	0.00	8.46	0.36	59.10	1.910	14.98	1.20	-290	
12:48		200.00	0.60	8.07	0.00	31.20	1.990	14.82	1.30	-278	
12:53	5.88	200.00	0.60	7.77	0.00	7.39	2.050	14.80	1.30	-276	
12:58		200.00	0.90	7.73	0.00	4.94	2.060	14.65	1.30	-273	
13:03	5.88	200.00	1.20	7.69	0.00	5.23	2.060	15.02	1.30	-271	
13:08		200.00	1.50	7.59	0.00	4.00	2.070	14.82	1.30	-268	
13:13	5.88	200.00	1.80	7.58	0.00	4.35	2.060	14.79	1.30	-265	
13:18		200.00	2.10	7.53	0.00	2.53	2.060	14.81	1.30	-263	
13:23	5.88	200.00	2.40	7.52	0.00	1.94	2.060	14.78	1.30	-263	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/19/09-13:40

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.52	Ferrous Iron (mg/L)	1.20
Spec. Cond.(mS/cm)	2.06	Manganese	0.00
Turbidity (NTU)	1.94	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	284.00
Temp.(°C)	14.78	Hydrogen Sulfide	0.00
TDS (g/L)	1.30	Alkalinty	276.00
ORP (mv)	-263.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-7

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/19/09-12:40

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.24

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:40	6.24			10.95	0.65	76.00	2.760	14.85	1.80	-197	
12:45		240.00	0.30	10.86	0.00	33.00	2.420	14.95	1.50	-252	
12:50		240.00	0.70	9.33	0.00		2.010	14.74	1.30	-259	
12:55	6.30	240.00	1.10	8.66	0.00	32.00	1.880	14.68	1.20	-290	
13:00		240.00	1.50	8.49	0.00	28.00	1.840	14.71	1.10	-286	
13:10	6.30	240.00	2.50	7.73	0.00	23.00	1.740	14.76	1.10	-267	
13:15	6.30	240.00	2.90	7.97	0.00	22.00	1.720	14.88	1.10	-266	
13:20	6.30	240.00	3.30	7.52	0.00	22.00	1.720	14.80	1.10	-264	
13:25	6.30	240.00	3.70	7.41	0.00	21.00	1.710	14.60	1.10	-266	
13:30	6.30	240.00	4.10	7.36	0.00	21.00	1.710	14.63	1.10	-266	
13:35	6.30	240.00	4.50	7.31	0.00	20.00	1.740	15.53	1.10	-264	
13:40	6.30	240.00	4.90	7.26	0.00	20.00	1.740	15.26	1.10	-264	
13:45	6.30	240.00	5.30	7.23	0.00	20.00	1.720	14.69	1.10	-264	
13:50		240.00	5.60	7.21	0.00		1.710	14.71	1.10	-263	
13:55		240.00	6.00	7.19	0.00		1.710	14.73	1.10	-262	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/19/09-14:00

Total Volume of Water purged: 6 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.19	Ferrous Iron (mg/L)	0.80
Spec. Cond.(mS/cm)	1.71	Manganese	0.00
Turbidity (NTU)		Sulfate	200.00
DO (mg/L)	0.00	Carbon Dioxide	284.00
Temp.(°C)	14.73	Hydrogen Sulfide	0.00
TDS (g/L)	1.10	Alkalinity	348.00
ORP (mv)	-262.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility Well ID: PMW-8 Well Diameter: 2 Inches
 Samplers: EPS Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/19/09-10:50

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
6.18	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:50	6.18	240.00		7.77	1.59	63.00	0.873	14.90	0.55	-230	
10:55		240.00	0.30	8.58	0.00	26.00	0.868	15.46	0.56	-294	
11:00		240.00	0.60	8.85	0.00	21.00	0.871	15.55	0.56	-323	
11:05	6.21	240.00	1.00	8.01	0.00	18.00	0.983	15.27	0.80	-275	
11:10	6.22	240.00	1.30	7.23	0.00	15.00	1.480	15.23	1.00	-246	
11:15		240.00	1.70	7.01	0.00	13.00	1.520	15.36	1.00	-242	
11:20	6.24	240.00	2.10	6.95	0.00	12.00	1.540	15.30	1.00	-241	
11:25	6.24	240.00	2.40	6.97	0.00	12.00	1.540	15.26	1.00	-241	
11:30		240.00	2.80	6.88	0.00	11.00	1.580	14.66	1.00	-242	
11:35	6.25	240.00	3.10	6.88	0.00	11.00	1.580	14.60	1.00	-246	
11:40	6.25	240.00	3.5	6.88	0.00	11.00	1.58	14.64	1.00	-245	

Sampling Data

Method: Geopump/Low Flow Date/Time: 10/16/09-11:45 Total Volume of Water purged: 3.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.88	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	1.58	Manganese	0.00
Turbidity (NTU)	11.00	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	270.00
Temp.(°C)	14.64	Hydrogen Sulfide	0.00
TDS (g/L)	1.00	Alkalinty	400.00
ORP (mv)	-245.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-9

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/19/09-10:56

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:56	5.56	200.00	0.00	7.32	3.57	7.09	1.230	13.64	0.80	-163	
11:01		200.00	0.30	7.11	0.00	4.13	1.960	13.74	1.30	-158	
11:06	5.58	200.00	0.60	7.07	0.00	1.44	2.030	13.80	1.50	-161	
11:11		200.00	0.90	7.04	0.00	0.77	2.440	13.86	1.60	-179	
11:16	5.58	200.00	1.20	7.04	0.00	1.23	2.460	13.84	1.60	-180	
11:21		200.00	1.50	7.04	0.00	0.47	2.480	13.83	1.60	-182	
11:26	5.58	200.00	1.80	7.03	0.00	0.29	2.490	13.83	1.60	-185	
11:31		200.00	2.10	7.02	0.00	0.36	2.490	13.81	1.60	-187	
11:36	5.58	200.00	2.40	7.02	0.00	0.21	2.490	13.80	1.60	-189	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/19/09-11:45

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.02	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	2.49	Manganese	0.00
Turbidity (NTU)	0.21	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	302.00
Temp.(°C)	13.80	Hydrogen Sulfide	0.00
TDS (g/L)	1.60	Alkalinty	316.00
ORP (mv)	-189.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-01

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-11:45

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
8.28	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:45	8.28	220.00		6.71	0.30	84.00	1.450	12.24	0.90	-337	
11:50		220.00	0.30	6.90	0.05		1.460	12.46	0.90	-358	
11:55		220.00	0.70	6.93	0.00	62.00	1.450	12.71	0.90	-368	
12:00	9.06	220.00	1.00	6.93	0.00	16.00	1.450	12.74	0.90	-375	
12:05	9.08	220.00	1.30	6.93	0.00	6.10	1.450	12.78	0.90	-382	
12:10		220.00	1.60	6.91	0.00	5.60	1.450	12.82	0.90	-387	
12:15	9.10	220.00	1.90	6.90	0.00	4.90	1.460	12.78	0.90	-389	
12:20		220.00	2.30	6.89	0.00	4.50	1.470	12.76	0.90	-388	
12:25	9.12	220.00	2.60	6.89	0.00	4.80	1.470	12.75	0.90	-388	
12:30	9.13	220.00	2.90	6.88	0.00	5.10	1.470	12.78	0.90	-389	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-12:40

Total Volume of Water purged: 2.90 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.88	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.47	Manganese	0.00
Turbidity (NTU)	5.10	Sulfate	175.00
DO (mg/L)	0.00	Carbon Dioxide	352.00
Temp.(°C)	12.78	Hydrogen Sulfide	1.50
TDS (g/L)	0.90	Alkalinty	414.00
ORP (mv)	-389.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-02

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/15/09-14:55

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
8.26

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:55	8.26	240.00		6.71	0.00	121.00	1.330	12.12	0.90	-33	
15:00		240.00	0.30	7.00	0.00	66.00	1.380	12.66	0.90	-353	
15:05		240.00	0.70	6.90	0.00	23.00	1.390	12.66	0.90	-376	
15:10	9.12	240.00	1.10	6.87	0.00	9.30	1.400	12.51	0.90	-383	
15:15	9.14	240.00	1.50	6.85	0.00	6.20	1.550	12.74	1.00	-374	
15:20	9.15	240.00	1.90	6.84	0.00	7.10	1.630	12.42	1.00	-367	
15:25		240.00	2.30	6.83	0.00	6.80	1.640	12.31	1.00	-366	
15:30	9.17	240.00	2.70	6.82	0.00	6.30	1.630	12.41	1.00	-368	
15:35		240.00	3.00	6.83	0.00	5.90	1.630	12.49	1.00	-368	
15:40	9.19	240.00	3.40	6.83	0.00	5.50	1.630	12.46	1.00	-368	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/15/09-15:50

Total Volume of Water purged: 3.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.83	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.63	Manganese	0.00
Turbidity (NTU)	5.50	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	378.00
Temp.(°C)	12.46	Hydrogen Sulfide	1.60
TDS (g/L)	1.00	Alkalinty	380.00
ORP (mv)	-368.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-03

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/20/09-13:25

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.14

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:25	6.14	240.00		7.04	0.26	60.00	1.780	15.35	1.10	-246	
13:30		240.00	0.30	7.03	0.00	48.00	1.770	15.28	1.10	-279	
13:35		240.00	0.70	6.92	0.00	32.00	1.760	15.23	1.10	-298	
13:40	6.18	240.00	1.10	6.93	0.00	16.00	1.750	15.03	1.10	-303	
13:45	6.18	240.00	1.50	6.94	0.00	14.00	1.770	14.97	1.10	-308	
13:50		240.00	1.80	6.94	0.00	14.00	1.740	14.87	1.10	-312	
13:55	6.18	240.00	2.20	6.94	0.00	13.00	1.720	14.89	1.10	-317	
14:00	6.18	240.00	2.60	6.93	0.00	13.00	1.700	14.82	1.10	-322	
14:05		240.00	3.00	6.92	0.00	12.00	1.690	14.76	1.10	-326	
14:10	6.18	240.00	3.40	6.91	0.00	12.00	1.690	14.81	1.10	-328	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/20/09-14:20

Total Volume of Water purged: 3.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.91	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	1.69	Manganese	0.00
Turbidity (NTU)	12.00	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	422.00
Temp.(°C)	14.81	Hydrogen Sulfide	1.75
TDS (g/L)	1.10	Alkalinty	410.00
ORP (mv)	-328.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-04

Well Diameter: 2 Inches

Samplers: EPS

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 10/20/09-10:05

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.22

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:05	6.22	240.00		8.70	0.09	114.00	2.820	14.90	1.80	-188	
10:10		240.00	0.30	8.07	0.00	68.00	1.900	15.21	1.10	-250	
10:20	6.26	240.00	1.00	7.52	0.00	32.00	1.690	15.04	1.10	-201	
10:25		240.00	1.40	7.27	0.00	30.00	1.700	14.92	1.10	-191	
10:30	6.26	240.00	1.70	7.18	0.00	16.00	1.690	14.86	1.10	-192	
10:35		240.00	2.30	7.10	0.00	14.00	1.680	14.81	1.10	-197	
10:40	6.26	240.00	2.70	7.07	0.00	14.00	1.680	14.75	1.10	-202	
10:45	6.26	240.00	3.20	7.02	0.00	13.00	1.670	14.75	1.10	-211	
10:50		240.00	3.60	7.01	0.00	12.00	1.670	14.71	1.10	-213	
10:55	6.26	240.00	4.00	6.99	0.00	12.00	1.670	14.73	1.10	-214	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 10/20/09-11:00

Total Volume of Water purged: 4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.99	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	1.67	Manganese	0.00
Turbidity (NTU)	12.00	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	326.00
Temp.(°C)	14.73	Hydrogen Sulfide	0.00
TDS (g/L)	1.10	Alkalinty	446.00
ORP (mv)	-214.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7A

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/14/09-11:05

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:05	6.87	180.00	0.00	7.66	1.33	94.80	0.900	11.40	0.50	-312	
11:10		180.00	0.30	7.88	0.08	22.90	0.990	12.09	0.70	-320	
11:15	8.74	180.00	0.60	7.84	0.00	7.43	0.980	12.59	0.60	-332	
11:20		180.00	0.90	7.78	0.00	7.31	1.020	12.81	0.70	-335	
11:25	10.37	180.00	1.20	7.75	0.00	3.40	1.060	12.88	0.70	-339	
11:30		180.00	1.50	7.73	0.00	6.30	1.160	12.94	0.80	-341	
11:35	11.51	180.00	1.80	7.71	0.00	2.37	1.180	12.92	0.80	-342	
11:40	11.74	180.00	2.10	7.69	0.00	2.03	1.200	12.96	0.80	-343	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/14/09-11:50

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.69	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.20	Manganese	0.00
Turbidity (NTU)	2.03	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	836.00
Temp.(°C)	12.96	Hydrogen Sulfide	1.25
TDS (g/L)	0.80	Alkalinty	770.00
ORP (mv)	-343.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7B

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/14/09-13:05

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
7.63	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:05	7.85	180.00	0.25	7.30	0.00	1000.00	1.060	12.05	0.70	-310	
13:10	7.82	170.00	0.50	7.45	0.00	1000.00	1.120	11.67	0.70	-329	
13:15	7.82	170.00	0.75	7.53	0.00	915.00	1.180	11.53	0.80	-339	
13:20	7.83	170.00	1.00	7.67	0.00	583.00	1.210	11.56	0.80	-346	
13:25	7.83	170.00	1.25	7.76	0.00	492.00	1.230	11.62	0.80	-348	
13:30	7.83	170.00	1.50	7.84	0.00	415.00	1.230	11.63	0.80	-348	
13:35	7.83	170.00	1.75	7.83	0.00	420.00	1.240	11.60	0.80	-349	
13:40	7.83	170.00	2.00	7.89	0.00	415.00	1.240	11.61	0.80	-345	
13:45	7.83	170.00	2.25	7.90	0.00	413.00	1.250	116.60	0.80	-348	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/14/09-14:00

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.90	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.25	Manganese	0.00
Turbidity (NTU)	413.00	Sulfate	200.00
DO (mg/L)	0.00	Carbon Dioxide	588.00
Temp.(°C)	11.60	Hydrogen Sulfide	1.00
TDS (g/L)	0.80	Alkalinty	228.00
ORP (mv)	-348.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-10B

Well Diameter: 4 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/16/09-8:15

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:15	8.46	220.00	0.00	5.89	0.00	27.60	1.500	10.98	1.00	-35	
8:20		220.00	0.30	6.26	0.00	9.70	1.510	10.76	0.10	-66	
8:25	8.49	220.00	0.60	6.33	0.00	21.40	1.480	11.27	0.90	-80	
8:30		220.00	0.90	6.39	0.00	3.40	1.470	11.66	0.90	-91	
8:35	8.49	220.00	1.20	6.41	0.00	6.80	1.470	11.46	0.90	-96	
8:40		220.00	1.50	6.43	0.00	4.30	1.470	11.52	0.90	-100	
8:45	8.49	220.00	1.80	6.44	0.00	5.60	1.470	11.57	0.90	-103	
8:50		220.00	2.10	6.45	0.00	1.00	1.470	11.48	0.90	-105	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/16/09-9:00

Total Volume of Water purged: 2.1 gal

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.45	Ferrous Iron (mg/L)	0.80
Spec. Cond.(mS/cm)	1.47	Manganese	0.00
Turbidity (NTU)	1.00	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	430.00
Temp.(°C)	11.48	Hydrogen Sulfide	0.50
TDS (g/L)	0.90	Alkalinty	296.00
ORP (mv)	-105.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-11B

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/16/09-08:15

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
8.35	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:15	8.45	240.00	0.25	7.62	0.00	0.94	1.240	12.28	0.80	-279	
8:20	8.45	240.00	0.50	7.69	0.00	1.50	1.240	12.85	0.80	-300	
8:25	8.45	240.00	0.75	7.79	0.00	1.00	1.260	12.81	0.80	-324	
8:30	8.45	240.00	1.00	7.85	0.00	1.20	1.260	12.55	0.80	-334	
8:35	8.45	240.00	1.25	7.90	0.00	1.00	1.260	12.51	0.80	-341	
8:40	8.45	240.00	1.50	7.92	0.00	1.00	1.280	12.55	0.80	-345	
8:45	8.45	240.00	1.75	7.93	0.00	1.20	1.280	12.62	0.80	-350	
8:50	8.45	240.00	2.00	7.92	0.00	1.00	1.280	12.62	0.80	-351	
8:55	8.45	240.00	2.25	7.92	0.00	1.50	1.280	12.63	0.80	-351	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/16/09-09:10

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.62	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.28	Manganese	0.00
Turbidity (NTU)	1.50	Sulfate	175.00
DO (mg/L)	0.00	Carbon Dioxide	514.00
Temp.(°C)	12.63	Hydrogen Sulfide	1.65
TDS (g/L)	0.80	Alkalinty	376.00
ORP (mv)	-351.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17A

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/11/09-10:45

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:45	4.26	200.00	0.30	8.92	13.79	23.74	4.410	11.46	2.80	-229	
10:50		200.00	0.60	8.87	13.74	20.40	4.430	11.45	2.80	-229	
10:55	4.45	200.00	0.90	8.83	13.81	13.81	4.480	11.43	2.90	-231	
11:00		200.00	1.20	8.63	13.90	22.60	4.490	11.24	2.90	-240	
11:05	4.54	200.00	1.50	8.61	13.91	10.92	4.510	11.00	2.90	-241	
11:10		200.00	1.80	8.57	13.34	9.48	4.540	10.61	2.90	-243	
11:15	4.54	200.00	2.10	8.52	12.90	7.25	4.560	10.51	2.90	-245	
11:20		200.00	2.40	8.53	10.20	9.04	4.540	10.38	2.90	-247	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/11/09-11:30

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	8.53	Ferrous Iron (mg/L)	1.50
Spec. Cond.(mS/cm)	4.54	Manganese	0.00
Turbidity (NTU)	9.04	Sulfate	>200
DO (mg/L)	10.20	Carbon Dioxide	316.00
Temp.(°C)	10.38	Hydrogen Sulfide	0.00
TDS (g/L)	2.90	Alkalinty	368.00
ORP (mv)	-247.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17A

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-9:15

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:15		220.00	0.00	8.83	0.00	28.30	4.230	14.12	2.60	-233	
9:20		220.00	0.40	8.70	0.00	22.60	4.260	14.14	2.70	-236	
9:25	4.57	220.00	0.80	8.58	0.00	14.10	4.320	14.14	2.70	-238	
9:30	4.60	220.00	1.20	8.52	0.00	10.80	4.380	14.17	2.70	-242	
9:35	4.62	220.00	1.60	8.47	0.00	7.46	4.400	14.19	2.80	-244	
9:40	4.68	220.00	2.00	8.46	0.00	8.26	4.410	14.21	2.80	-245	
9:45	4.68	220.00	2.40	8.46	0.00	7.15	4.420	14.24	2.80	-248	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-9:55

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH		Ferrous Iron (mg/L)	
Spec. Cond.(mS/cm)		Manganese	
Turbidity (NTU)		Sulfate	
DO (mg/L)		Carbon Dioxide	
Temp.(°C)		Hydrogen Sulfide	
TDS (g/L)		Alkalinty	
ORP (mv)		* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: MW-17A sample was collected on 12/11/09, VFA samples froze and broke in transit to lab. MW-17A resampled for VFA only

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17B

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/11-09-09:37

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:37	4.45	200.00	0.30	7.04	0.00	82.50	2.270	12.31	1.40	-319	
9:42		200.00	0.60	7.04	0.00	75.30	2.220	12.46	1.30	-310	
9:47	4.52	200.00	0.90	7.06	0.00	68.70	2.190	12.48	1.40	-312	
9:52		200.00	1.20	7.07	0.00	39.20	1.990	13.33	1.30	-317	
9:57	4.51	200.00	1.50	7.10	0.00	35.70	1.990	13.66	1.30	-325	
10:02		200.00	1.80	7.19	0.00	31.60	1.910	13.64	1.30	-330	
10:07	4.51	200.00	2.10	7.19	0.00	38.40	1.850	13.63	1.30	-333	
10:12		200.00	2.40	7.20	0.00	39.20	1.840	13.62	1.20	-335	
10:17	4.51	200.00	2.70	7.20	0.00	37.50	1.830	13.59	1.20	-337	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/11/09-10:30

Total Volume of Water purged: 2.7 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.20	Ferrous Iron (mg/L)	1.20
Spec. Cond.(mS/cm)	1.83	Manganese	0.00
Turbidity (NTU)	37.50	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	664.00
Temp.(°C)	13.59	Hydrogen Sulfide	0.00
TDS (g/L)	1.20	Alkalinty	252.00
ORP (mv)	-337.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: Collected MW-17B (MS, MSD)/ Clear water with a little substrate floctuating

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17B

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-10:10

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:10	4.51	220.00	0.00								
10:15	4.53	220.00	0.30								
10:20	4.53	220.00	0.60								
10:25	4.55	220.00	0.90								
10:30	4.55	220.00	1.30								
10:35	4.55	220.00	1.40								
10:40	4.55	220.00	2.10								
10:45	4.55	220.00	2.50								
10:50	4.55	220.00	2.90								

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-11:00

Total Volume of Water purged: 2.9 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH		Ferrous Iron (mg/L)	
Spec. Cond.(mS/cm)		Manganese	
Turbidity (NTU)		Sulfate	
DO (mg/L)		Carbon Dioxide	
Temp.(°C)		Hydrogen Sulfide	
TDS (g/L)		Alkalinty	
ORP (mv)		* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: MW-17B sampled on 12/11/09-VFA samples froze and broke in transit to lab, MW-17B resampled for VFA only, MS/MSD included

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-1

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-08:05

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
6.6	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:05	8.11	160.00	0.25	7.36	0.00	7.59	0.806	11.11	0.51		
8:10	8.12	160.00	0.50	7.31	0.00	6.98	0.814	11.18	0.52		
8:15	8.14	150.00	0.75	7.42	0.00	7.53	0.873	10.90	0.55		
8:20	8.16	150.00	1.00	7.57	0.00	5.90	0.880	11.43	0.56		
8:25	8.17	150.00	1.25	7.74	0.00	5.26	0.908	11.72	0.58		
8:30	8.20	150.00	1.50	7.80	0.00	5.28	0.908	11.72	0.60		
8:35	8.22	150.00	1.75	7.81	0.00	5.75	0.908	11.72	0.60		
8:40	8.25	150.00	2.00	7.81	0.00	5.23	0.908	11.76	0.60		
8:45	8.28	150.00	2.25	7.80	0.00	5.81	0.908	11.79	0.60		

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-9:05:00 AM

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.80	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	0.91	Manganese	0.00
Turbidity (NTU)	5.81	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	528.00
Temp.(°C)	11.79	Hydrogen Sulfide	1.10
TDS (g/L)	0.60	Alkalinty	508.00
ORP (mv)	-358.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-2

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/10/09-13:15

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:15	6.70	200.00	0.00	8.13	8.77	60.20	1.130	12.06	0.70	-184	
13:20		200.00	0.30	8.18	8.85	43.90	1.140	12.14	0.70	-222	
13:25	7.76	200.00	0.60	8.20	9.06	21.10	1.120	11.82	0.70	-240	
13:30		200.00	0.90	8.22	8.43	25.00	1.120	11.94	0.70	-246	
13:35	7.79	200.00	1.20	7.92	7.88	18.50	1.130	12.07	0.70	-250	
13:40		200.00	1.50	8.17	7.22	13.20	1.120	12.28	0.70	-269	
13:45	8.00	200.00	1.80	8.20	7.21	11.20	1.110	12.51	0.70	-271	
13:50		200.00	2.10	8.22	7.20	10.53	1.110	12.44	0.70	-272	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/10/09-14:05

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	8.22	Ferrous Iron (mg/L)	0.80
Spec. Cond.(mS/cm)	1.11	Manganese	0.00
Turbidity (NTU)	10.53	Sulfate	>200
DO (mg/L)	7.20	Carbon Dioxide	516.00
Temp.(°C)	12.44	Hydrogen Sulfide	1.50
TDS (g/L)	0.70	Alkalinity	364.00
ORP (mv)	-272.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-3

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/14/09-11:30

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
6.34	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:35	6.60	180.00	0.50	6.09	4.47	40.90	1.510	8.25	1.00	-316	change Horriba-restarted
11:40	6.66	180.00	0.75	8.01	0.00	72.60	1.050	9.84	0.70	-342	
11:45	6.66	160.00	1.00	8.01	0.00	24.70	1.050	10.43	0.70	-344	
11:50	6.67	150.00	1.25	8.01	0.00	22.30	1.050	10.70	0.70	-346	
11:55	6.67	150.00	1.50	8.00	0.00	23.60	1.070	11.06	0.70	-348	
12:00	6.67	150.00	1.75	7.97	0.00	29.00	1.090	11.28	0.70	-350	
12:05	6.67	150.00	2.00	7.94	0.00	29.50	1.090	11.27	0.70	-350	
12:10	6.67	150.00	2.25	7.93	0.00	29.90	1.090	11.29	0.70	-351	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/14/09-12:10

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.93	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.09	Manganese	0.00
Turbidity (NTU)	29.90	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	704.00
Temp.(°C)	11.29	Hydrogen Sulfide	1.10
TDS (g/L)	0.70	Alkalinty	598.00
ORP (mv)	-351.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: Duplicate PMW-30-12/14/09-12:40

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-4

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/10/09-12:05

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:05	7.90	200.00	0.00	8.73	4.43	31.10	0.900	12.55	0.65	-203	
12:10		200.00	0.30	8.21	0.00	39.50	0.960	12.41	0.61	-192	
12:15	8.12	200.00	0.60	8.14	0.00	43.10	0.948	11.97	0.61	-190	
12:20		200.00	0.90	8.13	0.00	48.20	0.949	11.93	0.61	-191	
12:25		200.00	1.20	8.12	0.00	52.50	0.951	11.52	0.61	-193	
12:30		200.00	1.50	8.12	0.00	58.30	0.952	11.54	0.61	-195	
12:35		200.00	1.80	8.13	0.00	54.20	0.954	11.61	0.62	-197	
12:40		200.00	2.10	8.13	0.00	52.80	0.955	11.30	0.63	-199	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/10/09-12:45

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	8.13	Ferrous Iron (mg/L)	1.20
Spec. Cond.(mS/cm)	0.96	Manganese	0.00
Turbidity (NTU)	52.80	Sulfate	200.00
DO (mg/L)	0.00	Carbon Dioxide	488.00
Temp.(°C)	11.30	Hydrogen Sulfide	0*
TDS (g/L)	0.63	Alkalinty	434.00
ORP (mv)	-199.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: *Turned pink, not blue

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-5

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-10:20

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.22	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:20	4.25	250.00	0.25	6.97	0.51	39.50	3.080	13.69	2.00	-331	
10:25	4.25	250.00	0.50	7.01	0.43	20.30	3.060	13.66	2.00	-334	
10:30	4.25	250.00	0.75	7.02	0.40	18.30	3.100	13.60	2.00	-335	
10:35	4.25	250.00	1.00	7.04	1.02	15.40	3.190	13.65	2.00	-335	re-calibrated instrument
10:40	4.25	250.00	1.50	6.82	0.00	13.70	3.880	12.18	2.50	-318	
10:45	4.25	250.00	1.75	6.94	0.00	15.00	3.850	13.48	2.50	-330	
10:50	4.25	250.00	2.00	7.00	0.00	16.00	3.840	13.50	2.50	-336	
10:55	4.25	250.00	2.25	7.04	0.00	18.90	3.840	13.45	2.50	-339	
11:00	4.25	250.00	2.50	7.04	0.00	17.90	3.840	13.42	2.50	-341	
11:05	4.25	250.00	2.75	7.06	0.00	17.50	3.840	13.44	2.50	-342	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-11:40

Total Volume of Water purged: 2.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.06	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	3.84	Manganese	0.00
Turbidity (NTU)	17.50	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	1198.00
Temp.(°C)	13.44	Hydrogen Sulfide	0.65
TDS (g/L)	2.50	Alkalinty	1044.00
ORP (mv)	-342.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-6

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-12:15

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.35

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:20	4.36	200.00	0.25	7.33	0.00	103.00	2.990	12.96	1.90	-341	
12:25	4.36	200.00	0.50	7.35	0.00	25.70	2.890	13.25	1.80	-346	
12:30	4.36	200.00	0.75	7.35	0.00	17.20	2.850	13.31	1.80	-348	
12:35	4.36	200.00	1.00	7.33	0.00	9.30	2.810	13.34	1.80	-348	
12:40	4.36	200.00	1.25	7.33	0.00	6.59	2.760	13.42	1.80	-349	
12:45	4.36	200.00	1.50	7.33	0.00	5.96	2.760	13.37	1.80	-350	
12:50	4.36	200.00	1.75	7.34	0.00	3.16	2.760	13.40	1.80	-351	
12:55	4.36	200.00	2.00	7.36	0.00	4.08	2.760	13.36	1.80	-352	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-13:00

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.36	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	2.76	Manganese	0.00
Turbidity (NTU)	4.08	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	760.00
Temp.(°C)	13.36	Hydrogen Sulfide	0.60
TDS (g/L)	1.80	Alkalinty	650.00
ORP (mv)	-352.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-7

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/16/09-09:30

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.85	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:35	4.85	160.00	0.25	7.24	0.00	122.00	2.560	12.76	1.60	-342	
9:40	4.85	160.00	0.50	7.25	0.00	216.00	2.410	12.62	1.60	-346	
9:45	4.85	160.00	0.75	7.27	0.00	245.00	2.300	13.11	1.50	-348	
9:50	4.85	160.00	1.00	7.28	0.00	177.00	2.180	13.38	1.40	-351	
9:55	4.85	160.00	1.25	7.30	0.00	249.00	2.100	13.20	1.30	-352	
10:00	4.85	160.00	1.50	7.31	0.00	130.00	2.050	13.16	1.30	-353	
10:05	4.85	160.00	1.75	7.32	0.00	126.00	1.950	13.11	1.30	-354	
10:10	4.85	160.00	2.00	7.32	0.00	123.00	1.940	13.19	1.30	-355	
10:15	4.85	160.00	2.25	7.33	0.00	120.00	1.940	13.11	1.30	-355	
10:20	4.85	160.00	2.50	7.33	0.00	125.00	1.940	13.14	1.30	-355	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/16/09-10:30

Total Volume of Water purged: 2.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.33	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	1.94	Manganese	0.00
Turbidity (NTU)	125.00	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	596.00
Temp.(°C)	13.14	Hydrogen Sulfide	0.75
TDS (g/L)	1.30	Alkalinty	562.00
ORP (mv)	-355.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-8

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-13:10

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.65

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:15	4.66	200.00	0.25	8.57	0.00	8.48	1.250	13.47	0.80	-303	
13:20	4.66	200.00	0.50	8.00	0.00	2.86	1.290	13.71	0.80	-306	
13:25	4.66	200.00	0.75	8.00	0.00	2.67	1.300	13.73	0.80	-306	
13:30	4.67	200.00	1.00	8.01	0.00	1.86	1.310	13.75	0.80	-306	
13:35	4.67	200.00	1.25	8.00	0.00	4.92	1.310	13.71	0.80	-306	
13:40	4.67	200.00	1.50	8.00	0.00	4.70	1.310	13.62	0.80	-306	
13:45	4.67	200.00	1.75	8.00	0.00	2.10	1.310	13.61	0.80	-306	
13:50	4.67	200.00	2.00	7.99	0.00	2.60	1.310	13.60	0.80	-307	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-14:10

Total Volume of Water purged: 2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.99	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	1.31	Manganese	0.00
Turbidity (NTU)	2.60	Sulfate	200.00
DO (mg/L)	0.00	Carbon Dioxide	240.00
Temp.(°C)	13.60	Hydrogen Sulfide	1.50
TDS (g/L)	0.80	Alkalinty	248.00
ORP (mv)	-307.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-9

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/16/09-10:45

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.16

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:50	4.16	160.00	0.25	8.07	0.00	3.72	1.630	10.77	1.00	-298	
11:00	4.16	160.00	0.50	8.07	0.00	2.28	1.480	10.49	0.90	-300	
11:10	4.16	160.00	0.75	8.06	0.00	1.51	1.390	10.78	0.90	-300	
11:20	4.16	160.00	1.00	8.05	0.00	0.91	1.360	11.05	0.90	-308	
11:30	4.16	160.00	1.25	8.05	0.00	1.03	1.340	11.56	0.90	-323	
11:40	4.16	160.00	1.50	8.05	0.00	1.40	1.330	11.65	0.90	-340	
11:50	4.16	160.00	1.75	8.05	0.00	1.35	1.330	11.70	0.90	-348	
12:00	4.16	160.00	2.00	8.05	0.00	1.35	1.330	11.45	0.90	-348	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/16/09-12:05

Total Volume of Water purged: 2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	8.05	Ferrous Iron (mg/L)	0.40
Spec. Cond.(mS/cm)	1.33	Manganese	0.00
Turbidity (NTU)	1.35	Sulfate	>200
DO (mg/L)	0.00	Carbon Dioxide	448.00
Temp.(°C)	11.45	Hydrogen Sulfide	1.75
TDS (g/L)	0.90	Alkalinty	388.00
ORP (mv)	-348.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-01

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/14/09-14:10

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
6.86	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:15	7.17	180.00	0.25	7.66	4.89	10.21	1.100	11.51	0.70	-326	
14:20	7.17	180.00	0.50	7.66	0.00	8.07	1.130	11.94	0.70	-337	
14:25	7.17	180.00	0.75	7.66	0.00	5.89	1.150	12.09	0.70	-344	
14:30	7.17	180.00	1.00	7.67	0.00	4.38	1.160	12.18	0.70	-346	
14:35	7.17	180.00	1.25	7.68	0.00	3.67	1.160	12.20	0.70	-348	
14:40	7.17	180.00	1.50	7.68	0.00	3.63	1.160	12.19	0.70	-350	
14:45	7.17	180.00	1.75	7.68	0.00	3.61	1.160	12.20	0.70	-351	
14:50	7.17	180.00	2.00	7.68	0.00	3.62	1.160	12.21	0.70	-351	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/14/09-15:00

Total Volume of Water purged: 2.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.66	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.16	Manganese	0.00
Turbidity (NTU)	3.62	Sulfate	100.00
DO (mg/L)	0.00	Carbon Dioxide	676.00
Temp.(°C)	12.21	Hydrogen Sulfide	1.15
TDS (g/L)	0.70	Alkalinty	436.00
ORP (mv)	-351.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-02

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/10/09-9:32

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:32	6.88	200.00	0.00	7.52	1.03	20.72	0.92	11.45	0.60	-286	
9:37		200.00	0.30	7.80	0.00	17.10	1.00	11.26	0.60	-319	
9:42	6.95	200.00	0.60	7.88	0.00	7.39	1.02	11.07	0.70	-322	
9:47		200.00	0.90	7.89	0.00	10.63	1.05	11.08	0.70	-326	
9:52	6.97	200.00	1.20	7.91	0.00	7.31	1.07	11.07	0.70	-336	
9:57		200.00	1.5	7.90	0.00	10.41	1.08	11.05	0.70	-339	
10:02	6.98	200.00	1.80	7.91	0.00	6.96	1.10	11.09	0.70	-341	
10:07		200.00	2.10	7.91	0.00	3.00	1.12	11.08	0.70	-342	
10:12	6.98	200.00	2.40	7.91	0.00	3.80	1.14	11.05	0.70	-341	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/10/09-10:15

Total Volume of Water purged: 2.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.91	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.14	Manganese	0*
Turbidity (NTU)	3.80	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	556.00
Temp.(°C)	11.05	Hydrogen Sulfide	0.75
TDS (g/L)	0.70	Alkalinty	916.00
ORP (mv)	-341.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: * Turns orangish yellow-not pink in color

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-03

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/15/09-09:10

<i>WATER VOLUME CALCULATION</i>	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.48	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:15	4.52	300.00	0.50	7.21	0.00	53.70	2.420	14.17	1.50	-343	
9:20	4.52	300.00	1.00	7.18	0.00	36.90	2.390	14.25	1.50	-345	
9:25	4.52	300.00	1.50	7.19	0.00	32.10	2.420	14.25	1.60	-345	
9:30	4.52	300.00	2.00	7.13	0.00	19.30	2.510	14.21	1.60	-345	
9:35	4.52	300.00	2.50	7.12	0.00	29.10	2.520	14.21	1.60	-345	
9:40	4.52	300.00	3.00	7.11	0.00	25.60	2.520	14.27	1.60	-344	
9:45	4.51	300.00	3.50	7.10	0.00	24.10	2.520	14.20	1.60	-344	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/15/09-10:00

Total Volume of Water purged: 3.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.10	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	2.52	Manganese	0.00
Turbidity (NTU)	24.10	Sulfate	0.00
DO (mg/L)	0.00	Carbon Dioxide	976.00
Temp.(°C)	14.20	Hydrogen Sulfide	0.65
TDS (g/L)	1.60	Alkalinty	678.00
ORP (mv)	-344.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Microbe	1-Filter	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-04

Well Diameter: 2 Inches

Samplers: RC Becken

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 12/10/09-09:05

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:10	4.50	160.00	0.25	10.25	2.66	197.00	2.320	10.52	1.20	-280	
9:15	4.50	160.00	0.50	6.38	3.26	42.90	2.370	5.48	1.5	-320	
9:20	4.60	160.00	0.75	6.38	2.78	32.10	2.260	6.38	1.40	-322	
9:30	4.60	160.00	1.00	6.53	2.31	21.10	2.160	9.08	1.40	-328	
9:35	4.60	160.00	1.25	6.64	2.24	25.00	2.170	9.67	1.40	-331	
9:40	4.60	160.00	1.50	6.75	2.25	16.40	2.220	9.73	1.40	-332	
9:45	4.60	160.00	1.75	6.89	2.25	15.20	2.210	9.97	1.40	-333	
9:50	4.60	160.00	2.00	6.91	2.25	18.00	2.210	10.11	1.40	-333	
9:55	4.60	160.00	2.25	6.92	2.24	17.10	2.210	10.07	1.40	-334	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 12/10/09-10:40

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.92	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	2.21	Manganese	0*
Turbidity (NTU)	17.10	Sulfate	0.00
DO (mg/L)	2.24	Carbon Dioxide	674.00
Temp.(°C)	10.07	Hydrogen Sulfide	0.50
TDS (g/L)	1.40	Alkalinty	460.00
ORP (mv)	-334.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	1-250mL plastic	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: *turns orangish yellow-not pink color

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7A

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-10:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.03

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:11	11.35	350.00	1.00	6.85	0.00	37.10	0.139	14.50	0.90	-362	clear w/ floating particles/septic odors
10:16	11.40	200.00	1.30	6.84	0.00	34.50	0.137	13.20	0.90	-355	same
10:21	11.43	200.00	1.60	6.83	0.00	29.50	0.136	12.90	0.90	-353	same
10:26	11.45	200.00	1.90	6.83	0.00	29.70	0.135	12.90	0.90	-350	same
10:31	11.46	200.00	2.10	6.83	0.00	30.10	0.134	12.90	0.90	-351	same
10:36	11.41	200.00	2.40	6.82	0.00	32.70	0.135	12.90	0.90	-351	same
10:41	11.40	200.00	2.70	6.81	0.00	32.80	0.136	12.70	0.90	-353	same
10:46	11.40	200.00	3.00	6.81	0.00	30.90	0.135	12.90	0.90	-355	same

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-10:50

Total Volume of Water purged: 3.3 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.81	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	0.135	Manganese	<0.1
Turbidity (NTU)	30.90	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	149.00
Temp.(°C)	12.90	Hydrogen Sulfide	0.50
TDS (g/L)	0.90	Alkalinity	770.00
ORP (mv)	-355.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range)

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7B

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-11:21

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.69

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:31	7.73	340.00	0.80	6.91	0.00	33.10	0.168	13.40	1.10	-365	clear w/ floating particles/septic odors
11:36	7.88	340.00	1.20	6.88	0.00	33.00	0.169	13.00	1.10	-359	same
11:41	7.88	340.00	1.60	6.88	0.00	38.00	0.169	13.10	1.10	-352	
11:46	7.89	340.00	2.00	6.88	0.00	39.40	0.169	13.10	1.10	-354	same
11:51	7.89	340.00	2.40	6.87	0.00	37.70	0.170	13.20	1.10	-354	
11:56	7.91	340.00	2.80	6.87	0.00	37.90	0.169	13.30	1.10	-353	same

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/2010-12:10

Total Volume of Water purged: 4.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.87	Ferrous Iron (mg/L)	<0.1
Spec. Cond.(mS/cm)	0.169	Manganese	<0.1
Turbidity (NTU)	37.90	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	118.00
Temp.(°C)	13.30	Hydrogen Sulfide	5.00
TDS (g/L)	1.10	Alkalinity	385.00
ORP (mv)	-353.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: Used AL-TA Alkalinity Kit (high range), Collected MS/MSD all parameters

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-10B

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/10/10-9:00

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
8.21	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:00	8.24	250.00	0.25	6.34	0.00	74.00	1.510	9.88	1.00	-95	
9:15	8.24	250.00	0.55	6.38	0.00	74.30	1.510	9.84	1.00	-100	
9:20	8.24	250.00	0.75	6.45	0.00	90.50	1.500	10.00	1.00	-106	
9:25	8.24	250.00	1.00	6.53	0.00	107.00	1.500	10.49	1.00	-116	
9:30	8.26	300.00	1.50	6.55	0.00	90.00	1.490	10.63	1.00	-121	
9:35	8.26	300.00	1.75	6.57	0.00	109.00	1.490	10.61	1.00	-127	
9:40	8.26	300.00	2.25	6.60	0.00	120.00	1.480	10.51	0.90	-132	
9:45	8.28	300.00	2.75	6.62	0.00	143.00	1.480	10.61	0.90	-141	
9:50	8.28	300.00	3.15	6.62	0.00	168.00	1.480	10.67	0.90	-145	
9:55	8.28	300.00	3.45	6.63	0.00	167.00	1.480	10.67	0.90	-149	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/10/2010-10:00

Total Volume of Water purged: 3.45 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.63	Ferrous Iron (mg/L)	0.50
Spec. Cond.(mS/cm)	1.48	Manganese	<0.1
Turbidity (NTU)	167.00	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	99.00
Temp.(°C)	10.67	Hydrogen Sulfide	0.10
TDS (g/L)	0.90	Alkalinity	385*
ORP (mv)	-149.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: *Used AL-TA Alkanlinity Kit (high range), Turbidity measurements came from the Horriba

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-11B

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/10/10-08:56

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
8.14

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:09	8.30	300.00	1.10	6.65	0.00	2.40	0.127	14.30	0.80	-376	clear
9:14	8.31	300.00	1.40	6.68	0.00	2.10	0.129	13.80	0.80	-376	septic odors
9:19	8.31	300.00	1.70	6.70	0.00	2.00	0.128	13.70	0.80	-377	
9:24	8.29	300.00	2.00	6.72	0.00	2.10	0.129	13.50	0.80	-378	
9:29	8.30	300.00	2.30	6.75	0.00	2.41	0.130	13.40	0.80	-379	
9:34	8.30	300.00	2.60	6.76	0.00	3.79	0.131	13.30	0.80	372	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/10/10-09:40

Total Volume of Water purged: 3.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.76	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	0.131	Manganese	0.20
Turbidity (NTU)	3.79	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	140.00
Temp.(°C)	13.30	Hydrogen Sulfide	2.00
TDS (g/L)	0.80	Alkalinity	770*
ORP (mv)	-372.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: *Used AL-TA Alkanlinity Kit (high range)

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17A

Well Diameter: 2 Inches

Samplers: Jim Schuetz/Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-15:07

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.31	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
15:07	4.74	450.00	0.50	6.77	0.00	304.00	4.180	9.29	2.70	-295	
15:13	4.76	450.00	1.00	6.85	0.00	189.00	4.820	9.20	2.70	-283	
15:18			1.30	6.88	0.00	120.00	4.300	9.31	2.70	-279	
15:24	4.80		1.60	6.89	0.00	99.00	4.280	9.29	2.70	-277	
15:29	4.82		2.40	6.90	0.00	88.90	4.230	9.33	2.70	-275	lower pump rate
15:48	4.75	280.00	3.50	6.91	0.00	44.80	4.190	9.00	2.70	-269	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-15:50

Total Volume of Water purged: 3.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.91	Ferrous Iron (mg/L)	2.20
Spec. Cond.(mS/cm)	4.19	Manganese	0.10
Turbidity (NTU)	44.80	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	220.00
Temp.(°C)	9.00	Hydrogen Sulfide	<0.1
TDS (g/L)	2.70	Alkalinity	<350
ORP (mv)	-269.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	300
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used AL-TA Alkalinity Kit (high range), MW-17A looks as though there is an additional stick-up from original casing

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17B

Well Diameter: 2 Inches

Samplers: Jim Schuetz, Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-13:30

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.5

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:35	4.62	500.00	0.75	6.52	0.00	422.00	1.810	11.55	1.10	-335	
13:40	4.64	500.00	1.25	6.60	0.00	120.00	4.330	11.86	2.80	-353	
13:45		500.00	1.75	6.63	0.00	57.00	4.500	11.69	2.90	-357	
13:50		500.00	2.50	6.57	0.00	96.00	4.410	12.02	2.80	-358	
13:56	4.65	500.00	3.50	6.54	0.00	60.00	4.250	11.95	2.70	-358	
14:04		500.00	5.00	6.51	0.00	78.00	4.030	12.05	2.60	-365	
14:11	4.56	500.00	6.00	6.51	0.00	46.10	4.010	11.13	2.60	-367	
14:14		500.00		6.51	0.00	75.90	4.010	11.18	2.60	-367	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-14:00

Total Volume of Water purged: 6.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.51	Ferrous Iron (mg/L)	0.09
Spec. Cond.(mS/cm)	4.01	Manganese	0.10
Turbidity (NTU)	7.50	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	60**
Temp.(°C)	11.18	Hydrogen Sulfide	5.00
TDS (g/L)	2.60	Alkalinity	670*
ORP (mv)	-367.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: *Used AL-TA Alkanlinity Kit (high range), **When performing the Carbon Dioxide HACH Kit Test the sample turned grey

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-1

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-14:32

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.26

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:45	9.41	300.00	0.90	7.06	0.00	6.21	0.115	11.30	0.70	-357	clear w/ few black particles
14:50	9.39	300.00	1.20	7.00	0.00	4.45	0.114	11.40	0.70	-360	
14:55	9.38	300.00	1.50	6.95	0.00	4.01	0.114	11.70	0.70	-361	
15:00	9.37	300.00	1.80	6.91	0.00	4.44	0.115	11.90	0.70	-365	
15:05	9.36	300.00	2.10	6.87	0.00	5.04	0.120	11.90	0.80	-370	
15:10	9.36	300.00	2.40	6.84	0.00	4.91	0.126	11.90	0.80	-371	
15:15	9.35	300.00	2.70	6.82	0.00	4.00	0.133	11.90	0.90	-375	
15:20	9.32	300.00	3.00	6.82	0.00	4.99	0.134	11.90	0.90	-375	
15:25	9.31	300.00	3.30	6.81	0.00	4.32	0.135	12.00	0.90	-375	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-15:30

Total Volume of Water purged: 4.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.81	Ferrous Iron (mg/L)	<0.1
Spec. Cond.(mS/cm)	0.135	Manganese	0.20
Turbidity (NTU)	4.32	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	196.00
Temp.(°C)	12.00	Hydrogen Sulfide	3.00
TDS (g/L)	0.90	Alkalinity	770.00
ORP (mv)	-375.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used AL-TA Alkalinity Kit (high range)

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-2

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/11/2010-9:00

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
8.82	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:00	9.40	300.00	0.50	6.39	0.00	241.00	1.660	9.92	1.10	-202	substrate particles
9:05	9.50	300.00	0.80	6.50	0.00	241.00	1.650	9.44	1.10	-263	present when pumping
9:10	9.38	300.00	1.00	6.51	0.00	347.00	1.650	9.45	1.00	-301	
9:15	9.30	300.00	1.50	6.55	0.00	14.30	1.670	9.49	1.10	-307	
9:20	9.32	300.00	1.75	6.54	0.00	15.60	1.650	9.59	1.10	-307	
9:25	9.38	300.00	2.00	6.53	0.00	16.80	1.650	9.61	1.10	-309	
9:30	9.38	300.00	2.25	6.52	0.00	9.53	1.650	9.61	1.10	-310	
9:35	9.38	300.00	2.50	6.52	0.00	9.57	1.650	9.60	1.10	-311	
9:40	9.36	300.00	2.75	6.51	0.00	9.56	1.650	9.60	1.10	-312	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/11/10-10:00

Total Volume of Water purged: 2.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.51	Ferrous Iron (mg/L)	2.50
Spec. Cond.(mS/cm)	1.65	Manganese	0.20
Turbidity (NTU)	9.56	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	40*
Temp.(°C)	9.60	Hydrogen Sulfide	5.00
TDS (g/L)	1.10	Alkalinty	306.00
ORP (mv)	-312.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060

Comments: *When performing the Carbon Dioxide HACH Kit Test the sample turned dark grey, not pink

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-3

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-13:16

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.52

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:29	8.61	280.00	1.00	6.96	0.00	7.08	0.145	12.50	0.90	-371	clear w/ few black particles
13:34	8.66	280.00	1.30	6.89	0.00	6.98	0.147	12.40	0.90	-372	
13:39	8.69	280.00	1.60	6.89	0.00	8.33	0.147	12.60	0.90	-373	
13:44	8.68	280.00	1.90	6.79	0.00	8.03	0.147	12.60	0.90	-373	
13:49	8.68	280.00	2.20	6.76	0.00	7.67	0.147	12.50	0.90	-375	
13:54	8.68	280.00	2.50	6.72	0.00	6.61	0.148	12.40	0.90	-374	
13:59	8.66	280.00	2.90	6.71	0.00	5.89	0.148	12.30	0.90	-374	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-14:05

Total Volume of Water purged: 4.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.71	Ferrous Iron (mg/L)	<0.1
Spec. Cond.(mS/cm)	0.148	Manganese	0.10
Turbidity (NTU)	5.89	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	197.00
Temp.(°C)	12.30	Hydrogen Sulfide	5.00
TDS (g/L)	0.90	Alkalinity	770.00
ORP (mv)	-374.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range)

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-4

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/11/10-08:44

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
8.06	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:54	8.33	320.00	0.90	6.40	0.05	30.90	0.149	12.90	0.90	-120	slightly cloudy
8:59	8.34	320.00	1.20	6.37	0.00	31.20	0.146	13.00	0.90	-124	
9:04	8.36	300.00	1.50	6.48	0.00	21.70	0.150	12.90	1.00	-135	clearer
9:09	8.42	300.00	1.80	6.52	0.00	20.90	0.152	13.20	1.00	-142	
9:14	8.43	300.00	2.10	6.59	0.00	20.40	0.157	12.90	1.00	-153	same
9:19	8.43	300.00	2.40	6.67	0.00	19.60	0.160	12.90	1.00	-157	
9:24	8.43	300.00	2.70	6.68	0.00	19.30	0.161	12.80	1.00	-160	
9:29	8.43	300.00	3.00	6.69	0.00	19.00	0.162	12.80	1.00	-162	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/11/10-9:35

Total Volume of Water purged: 4.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.69	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	0.162	Manganese	<0.1
Turbidity (NTU)	19.00	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	162.00
Temp.(°C)	12.80	Hydrogen Sulfide	<0.1
TDS (g/L)	1.00	Alkalinity	187.00
ORP (mv)	-162.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060

Comments: Used lower range HACH Kit for alkalinity

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-5

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/10/10-13:26

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.19

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:48	4.21	300.00	1.30	6.20	0.00	11.0	0.252	13.00	1.60	-341	started off cloudy but
13:53	4.28	300.00	1.60	6.18	0.00	8.00	0.250	13.10	1.60	-341	cleared up before starting
13:58	4.28	300.00	1.90	6.17	0.00	6.90	0.251	12.70	1.60	-340	taking readings.
14:03	4.28	300.00	2.20	6.19	0.00	7.60	0.244	12.80	1.60	-342	
14:08	4.28	300.00	2.50	6.15	0.00	6.10	0.245	13.00	1.60	-342	
14:11	4.28	300.00	2.80	6.14	0.00	6.00	0.244	12.90	1.60	-343	
14:16	4.28	300.00	3.20	6.14	0.00	5.50	0.244	12.90	1.60	-342	
14:21	4.28	300.00	3.50	6.09	0.00	5.10	0.241	13.00	1.50	-344	clear

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/10/10-14:25

Total Volume of Water purged: 4.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.09	Ferrous Iron (mg/L)	<0.1
Spec. Cond.(mS/cm)	0.241	Manganese	0.40
Turbidity (NTU)	5.10	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	347.00
Temp.(°C)	13.00	Hydrogen Sulfide	5.00
TDS (g/L)	1.50	Alkalinity	1155.00
ORP (mv)	-344.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range), gas bubbles coming through tubing during purging and sampling

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-6

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/10/10-14:15

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.3

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:15	4.28	300.00	0.25	6.32	0.00	150.00	2.380	6.64	1.50	-343	
14:20	4.28	300.00	0.50	6.31	0.00	40.00	2.350	7.75	1.50	-345	
14:25	4.28	300.00	0.75	6.32	0.00	15.90	2.340	7.88	1.50	-345	
14:30	4.28	300.00	1.00	6.31	0.00	12.00	2.360	7.40	1.50	-343	temp. of well dropped and
14:35	4.28	300.00	1.25	6.32	0.00	11.90	2.370	7.22	1.50	-344	pump slowed a little during purging
14:40	4.28	300.00	1.50	6.33	0.00	9.08	2.340	7.39	1.50	-345	(may be due to temp. outside)
14:45	4.28	300.00	1.75	6.33	0.00	6.30	2.360	7.30	1.50	-346	
14:50	4.28	300.00	2.00	6.32	0.00	5.27	2.370	6.64	1.50	-348	
15:00	4.28	300.00	2.25	6.33	0.00	4.10	2.350	6.97	1.50	-346	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/10/10-15:00

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.33	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	2.35	Manganese	0.70
Turbidity (NTU)	4.10	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	290.00
Temp.(°C)	6.97	Hydrogen Sulfide	2.00
TDS (g/L)	1.50	Alkalinity	770.00
ORP (mv)	-346.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range), When performing the manganese HACH Test Kit the color turned orange, Temp. outside dropped as day went on and may have affectec temp. readings. Pump speed slowed as pumping went on.

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-7

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/10/10-11:30

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.6

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:30	4.62	300.00	0.50	6.41	1.70	25.00	1.950	10.56	1.20	-350	
11:35	4.62	300.00	1.00	6.39	1.46	26.00	1.940	10.64	1.20	-353	
11:40	4.64	300.00	1.25	6.42	1.04	26.00	1.940	10.74	1.20	-355	
11:45	4.64	300.00	1.50	6.41	0.67	26.00	1.940	10.76	1.20	-357	
11:50	4.64	300.00	1.75	6.41	0.23	25.00	1.940	10.84	1.20	-358	
11:55	4.64	300.00	2.00	6.41	0.04	24.00	1.930	10.93	1.20	-359	
12:00	4.64	300.00	2.50	6.42	0.00	23.00	1.930	10.93	1.20	-359	
12:05	4.64	300.00	2.75	6.41	0.00	18.00	1.920	10.91	1.20	-360	
12:10	4.64	300.00	3.00	6.41	0.00	18.00	1.900	10.90	1.20	-361	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/10/10-12:10

Total Volume of Water purged: 3.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.41	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.90	Manganese	0.20
Turbidity (NTU)	18.00	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	215.00
Temp.(°C)	10.90	Hydrogen Sulfide	2.00
TDS (g/L)	1.20	Alkalinty	770.00
ORP (mv)	-361.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range), several gas bubbles where present while purging, when using the manganese HACH Test Kit the result was cloudy

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-8

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-8:33

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.66

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:43	4.66	320.00	0.75	7.56	0.00	5.50	0.128	15.10	0.80	-206	
8:48	4.68	320.00	1.10	7.86	0.00	4.47	0.140	14.90	0.90	-197	
8:53	4.68	320.00	1.50	7.08	0.00	3.73	0.154	15.50	1.00	-248	
8:58	4.68	320.00	1.90	6.99	0.00	3.70	0.156	15.50	1.00	-251	
9:03	4.68	320.00	2.10	6.91	0.00	3.70	0.157	15.30	1.00	-257	
9:06	4.68	320.00	2.40	6.86	0.00	3.44	0.157	15.30	1.00	-259	
9:09	4.68	320.00	2.75	6.85	0.00	2.83	0.157	15.20	1.00	-265	
9:12	4.68	320.00	3.10	6.86	0.00	2.75	0.158	15.20	1.00	-267	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-9:20

Total Volume of Water purged: 3.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.86	Ferrous Iron (mg/L)	0.30
Spec. Cond.(mS/cm)	0.158	Manganese	<0.1
Turbidity (NTU)	2.75	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	300.00
Temp.(°C)	15.20	Hydrogen Sulfide	0.10
TDS (g/L)	1.00	Alkalinty	180.00
ORP (mv)	-267.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used Alkalinity kit 5-400 range

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-9

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/1/10-10:52

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.95

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:07	3.92	320.00	0.90	7.00	0.15	4.10	0.127	12.70	0.80	-316	clear
11:12	3.92	320.00	1.20	6.92	0.00	2.70	0.123	12.20	0.80	-318	
11:17	3.91	320.00	1.50	6.91	0.00	3.10	0.130	11.90	0.80	-317	
11:22	3.91	320.00	1.80	6.88	0.00	3.60	0.129	11.80	0.80	-310	
11:27	3.91	320.00	2.10	6.87	0.00	3.40	0.130	11.80	0.80	-312	
11:32	3.91	320.00	2.40	6.86	0.00	3.20	0.130	11.80	0.80	-316	
11:37	3.91	320.00	2.70	6.83	0.00	1.50	0.129	11.80	0.80	-319	
11:42	3.92	320.00	3.00	6.84	0.00	1.90	0.129	11.80	0.80	-314	
11:47	3.92	320.00	3.30	6.84	0.00	2.10	0.130	11.70	0.80	-312	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/10/10-11:55

Total Volume of Water purged: 4.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.84	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	0.13	Manganese	<0.1
Turbidity (NTU)	2.10	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	96.00
Temp.(°C)	11.70	Hydrogen Sulfide	0.70
TDS (g/L)	0.80	Alkalinty	770.00
ORP (mv)	-312.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range)

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-01

Well Diameter: 2 Inches

Samplers: Cheryl Huey

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/11/10-10:05

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.04

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:18	7.29	300.00	1.20	6.76	0.00	12.60	0.136	16.70	0.90	-355	clear
10:23	7.30	300.00	1.50	6.79	0.00	6.80	0.146	12.90	1.00	-357	
10:28	7.30	300.00	1.80	6.80	0.00	5.7	0.150	12.50	1.00	-359	
10:33	7.37	300.00	2.10	6.82	0.00	6.26	0.153	12.40	1.00	-361	
10:38	7.39	300.00	2.40	6.83	0.00	5.90	0.154	11.90	1.00	-362	
10:43	7.40	300.00	2.70	6.85	0.00	5.64	0.157	11.70	1.00	-363	
10:48	7.41	300.00	3.00	6.86	0.00	4.95	0.158	12.00	1.00	-364	
10:53	7.41	300.00	3.30	6.88	0.00	4.06	0.158	11.90	1.00	-365	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/11/10-11:00

Total Volume of Water purged: 4.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.89	Ferrous Iron (mg/L)	<0.1
Spec. Cond.(mS/cm)	0.159	Manganese	<0.1
Turbidity (NTU)	4.06	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	212.00
Temp.(°C)	11.90	Hydrogen Sulfide	5.00
TDS (g/L)	1.00	Alkalinity	323*
ORP (mv)	-365.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060

Comments: * Used low range kit for alkalinity

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-02

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/11/10-10:40

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.16

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:40	7.24	300.00	0.25	6.69	0.00	11.40	1.390	9.01	0.90	-356	
10:45	7.26	300.00	0.50	6.70	0.00	6.85	1.380	8.79	0.90	-360	
10:50	7.28	300.00	0.75	6.70	0.00	3.71	1.390	8.79	0.90	-363	
10:55	7.28	300.00	1.15	6.69	0.00	1.30	1.400	8.69	0.90	-364	
11:00	7.28	300.00	1.45	6.70	0.00	1.19	1.410	8.70	1.00	-366	
11:05	7.28	300.00	1.75	6.71	0.00	1.20	1.410	8.70	1.00	-367	
11:10	7.28	300.00	2.15	6.71	0.00	1.30	1.400	8.69	1.00	-367	
11:15	7.28	300.00	2.45	6.72	0.00	1.31	1.410	8.70	1.00	-367	
11:20	7.28	300.00	2.75	6.73	0.00	1.30	1.420	8.70	1.00	-368	
11:25	7.28	300.00	3.15	6.74	0.00	1.31	1.410	8.71	1.00	-370	
11:30	7.28	300	3.45	6.73	0.00	1.30	1.42	8.72	1	-371	

Sampling Data

Method: Geopump/Low Flow Date/Time: 2/11/10-11:30 Total Volume of Water purged: 3.45 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.73	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.42	Manganese	<0.1
Turbidity (NTU)	1.30	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	200.00
Temp.(°C)	8.72	Hydrogen Sulfide	5.00
TDS (g/L)	1.00	Alkalinty	289.00
ORP (mv)	-371.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: _____

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-03

Well Diameter: 2 Inches

Samplers: Jim Schuetz and Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-8:45

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.49

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:00	4.79	450.00	3.00	5.76	0.00		3.110	10.46	2.00	-210	
9:15	4.82	450.00	6.00	5.91	0.00		3.370	10.47	2.20	-267	
9:20	4.84	450.00	9.00	5.97	0.00		3.510	10.85	2.20	-299	
9:25	4.86	450.00	11.50	5.99	0.00		3.600	10.83	2.30	-313	
9:31	4.81	450.00	13.50	6.00	0.00		3.640	11.03	2.30	-322	
9:40		450.00	17.50	6.01	0.00		3.690	11.01	2.40	-330	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-9:40

Total Volume of Water purged: 4.6 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.01	Ferrous Iron (mg/L)	2.40
Spec. Cond.(mS/cm)	3.69	Manganese	0.20
Turbidity (NTU)	539.00	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	162.00
Temp.(°C)	11.01	Hydrogen Sulfide	1.50
TDS (g/L)	2.40	Alkalinity	1925.00
ORP (mv)	-330.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Chloride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060

Comments: Used AL-TA Alkalinity Kit (high range), When performing the Carbon Dioxide HACH Kit Test the sample turned grey, observed semi-cloudy white particulates

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-04

Well Diameter: 2 Inches

Samplers: Jim Schuetz and Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 2/9/10-11:00

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.64

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:37	4.74	410.00	1.20	6.22	0.00	-5.00	2.650	11.13	1.70	-336	
11:45	4.76	410.00	2.00	6.26	0.00	NA	2.690	11.37	1.70	-341	
11:50	4.75	410.00		6.27	0.00		2.650	11.32	1.70	-341	
11:55	4.74	410.00	3.25	6.28	0.00		2.600	11.46	1.70	-348	
12:00		410.00	3.70	6.28	0.00	531.00	2.590	11.45	1.70	-349	
12:05		410.00	4.20	6.28	0.00		2.580	11.52	1.70	-351	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 2/9/10-12:10

Total Volume of Water purged: 4.2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.28	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	2.58	Manganese	0.20
Turbidity (NTU)	8.50	Sulfate	NA
DO (mg/L)	0.00	Carbon Dioxide	146.00
Temp.(°C)	11.52	Hydrogen Sulfide	2.00
TDS (g/L)	1.70	Alkalinty	1155.00
ORP (mv)	-351.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP
Choride/Bromide/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	Lab SOP

Comments: Used AL-TA Alkanlinity Kit (high range), When performing the Carbon Dioxide HACH Kit Test the sample turned grey, sample tube only at ~23' BTOC

MEE - Methane, ethane, ethene. Dissolved Inorganics - Al, As, Ca, K, Mg, Mn, Na. VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7A

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 4/1/10-0925

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.4

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
09:25	6.40	180	0	6.42	0.34	466.0	1.51	11.1	1.0	-335	
09:30	8.80	180	0.25	6.43	0.0	39.2	1.51	11.2	1.0	-338	
09:35		180	0.50	6.52	0.0	31.4	1.50	11.4	1.0	-342	
09:40	9.56	160	0.75	6.58	0.0	23.4	1.48	11.4	0.9	-341	Adjusted rate to reduce drawdown
09:45	9.75	160	0.90	6.56	0.0	20.6	1.48	11.5	0.9	-340	of water level. Lowest rate of
09:50	10.03	160	1.10	6.55	0.0	24.5	1.48	11.8	0.9	-340	flow possible.
09:55	10.26	160	1.35	6.56	0.0	16.1	1.48	11.8	0.9	-340	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 4/1/10-10:00

Total Volume of Water purged: 1.4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.56	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.48	Manganese	0.00
Turbidity (NTU)	16.10	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	3572
Temp.(°C)	11.80	Hydrogen Sulfide	2.25
TDS (g/L)	0.90	Alkalinty	153
ORP (mv)	-340.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7B

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/31/10-1405

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.18

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:05	7.18	275	0.00	6.61	0.00	116.0	1.48	12.30	1.00	-344	white, milky substraight material
14:10	7.19	275	0.25	6.60	0.00	111.0	1.44	12.01	1.00	-345	noticed
14:15	7.20	275	0.50	6.60	0.00	98.0	1.43	12.00	1.00	-345	
14:20	7.18	275	0.75	6.53	0.00	75.0	1.42	12.10	1.00	-346	
14:25	7.19	275	1.00	6.54	0.00	63.0	1.41	12.11	1.00	-347	small white particles observed
14:30	7.20	275	1.25	6.53	0.00	36.2	1.39	12.10	1.00	-348	
14:35	7.19	275	1.50	6.54	0.00	34.0	1.38	12.10	1.00	-348	
14:40	7.19	275	1.75	6.53	0.00	33.4	1.38	12.11	1.00	-347	
14:45	7.19	275	2.00	6.54	0.00	30.2	1.39	12.11	1.00	-347	
14:50	7.18	275	2.25	6.55	0.00	30.0	1.39	12.11	1.00	-348	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/31/10-1450

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.55	Ferrous Iron (mg/L)	0.01
Spec. Cond.(mS/cm)	1.39	Manganese	0.10
Turbidity (NTU)	30.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	1234.00
Temp.(°C)	12.11	Hydrogen Sulfide	2.00
TDS (g/L)	1.00	Alkalinty	204.00
ORP (mv)	-348.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-10B

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-09:00

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
7.85	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:00	7.85										
9:05		250	0.3	6.23	0.88	5.27	1.71	11.2	1.1	-81	
9:10	7.85	250	0.6	6.33	0.00	1.71	1.74	11.4	1.1	-128	
9:15		250	1.0	6.34	0.00	5.26	1.74	11.4	1.1	-131	
9:20	7.85	250	1.3	6.44	0.00	3.71	1.73	11.7	1.1	-141	
9:25		250	1.7	6.43	0.00	6.18	1.73	11.7	1.1	-143	
9:30	7.86	250	2.0	6.46	0.00	6.13	1.72	11.8	1.1	-145	
9:35	7.86	250	2.2	6.48	0.00	5.32	1.72	11.7	1.1	-146	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-09:40

Total Volume of Water purged: 2.2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.48	Ferrous Iron (mg/L)	0.4
Spec. Cond.(mS/cm)	1.72	Manganese	0.1
Turbidity (NTU)	5.32	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	180
Temp.(°C)	11.7	Hydrogen Sulfide	0.125
TDS (g/L)	1.1	Alkalinty	136
ORP (mv)	-146.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-11B

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-0950

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.95

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:50	7.95	300	0.25	6.75	0.00	0.00	1.69	11.77	1.1	-361	
9:55	8.00	300	0.50	6.75	0.00	0.00	1.67	11.72	1.1	-364	
10:00	7.99	300	0.75	6.76	0.00	0.00	1.68	11.76	1.1	-364	
10:05	7.99	300	1.25	6.76	0.00	0.00	1.66	11.73	1.1	-367	
10:10	7.98	300	1.50	6.75	0.00	0.40	1.67	11.73	1.1	-365	
10:15	7.98	300	1.75	6.76	0.00	0.00	1.66	11.74	1.1	-366	
10:20	7.99	300	2.00	6.76	0.00	0.00	1.66	11.74	1.1	-367	
10:25	7.98	300	2.25	6.76	0.00	0.00	1.66	11.73	1.1	-367	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-1030

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.75	Ferrous Iron (mg/L)	0.1
Spec. Cond.(mS/cm)	1.66	Manganese	0.0
Turbidity (NTU)	0.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	180
Temp.(°C)	11.73	Hydrogen Sulfide	5.0
TDS (g/L)	1.10	Alkalinty	170
ORP (mv)	-367.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17A

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-1520

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.70

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
15:20	3.70	300	0.00	7.17	0.0	987	3.96	12.40	2.5	-154	
15:25	3.75	300	0.25	7.13	0.0	980	3.95	12.39	2.5	-155	
15:30	3.76	300	0.50	7.11	0.0	980	3.94	12.40	2.5	-156	
15:35	3.79	300	0.75	7.10	0.0	760	3.92	12.39	2.6	-156	
15:40	3.79	300	1.00	7.08	0.0	743	3.90	12.40	2.6	-156	
15:45	3.80	300	1.25	6.88	0.0	740	3.90	12.40	2.6	-155	
15:50	3.79	300	1.50	6.86	0.0	420	3.95	12.39	2.6	-155	
15:55	3.79	300	1.75	6.85	0.0	317	3.97	12.39	2.6	-155	
16:00	3.80	300	2.00	6.86	0.0	316	3.98	12.40	2.6	-156	
16:05	3.79	300	2.20	6.85	0.0	316	3.97	12.40	2.6	-155	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-1605

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.85	Ferrous Iron (mg/L)	2.0
Spec. Cond.(mS/cm)	3.97	Manganese	0.0
Turbidity (NTU)	316	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	1632
Temp.(°C)	12.40	Hydrogen Sulfide	0.0
TDS (g/L)	2.6	Alkalinty	1.7
ORP (mv)	-155	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: Saw a lot of residual veg. oil in well,pump began slowly

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17B

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-1350

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.00

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:50	4.00	300.00	0.00	6.57	0.0	60.2	3.97	13.89	2.0	-330	
13:55	4.05	300.00	0.25	6.56	0.0	11.1	3.98	12.24	2.3	-332	
14:00	4.05	300.00	0.50	6.57	0.0	2.23	4.31	12.26	2.8	-327	
14:05	4.05	300.00	0.75	6.57	0.0	1.17	4.32	12.28	2.9	-329	
14:10	4.05	300.00	1.00	6.58	0.0	1.11	4.33	12.28	2.9	-330	
14:15	4.05	300.00	1.25	6.58	0.0	1.03	4.32	12.27	2.9	-330	
14:20	4.05	300.00	1.50	6.57	0.0	1.0	4.33	12.28	2.9	-331	
14:25	4.05	300.00	1.75	6.57	0.0	1.0	4.32	12.28	2.9	-331	
14:30	4.05	300.00	2.00	6.58	0.0	1.0	4.31	12.28	2.9	-330	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-14:30

Total Volume of Water purged: 2.00 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.58	Ferrous Iron (mg/L)	0.1
Spec. Cond.(mS/cm)	4.31	Manganese	0.0
Turbidity (NTU)	1.0	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	1684
Temp.(°C)	12.28	Hydrogen Sulfide	2.0
TDS (g/L)	2.90	Alkalinty	204
ORP (mv)	-330.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: *MS,MSD*

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-1

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/31/10-09:30

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
5.37

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:30	5.37		0.00	6.79	0.0	8.21	1.37	9.9	0.9	-289	
9:35		200	0.25	6.81	0.0	9.06	1.36	9.9	0.9	-295	
9:40	7.30	200	0.50	7.01	0.0	5.27	1.34	10.1	0.9	-310	
9:45		200	0.75	7.09	0.0	4.43	1.31	10.4	0.8	-314	Reduced flow rate stabilize drawdown
9:50	8.42	180	1.00	7.12	0.0	4.40	1.34	10.5	0.9	-328	of water level
9:55	8.27	180	1.20	7.16	0.0	4.31	1.36	10.5	0.9	-338	
10:00	8.24	180	1.40	7.17	0.0	4.12	1.40	10.6	0.9	-341	
10:05	8.12	180	1.60	7.15	0.0	3.53	1.45	10.7	0.9	-346	
10:10	7.99	180	1.80	7.12	0.0	4.18	1.48	10.6	1.0	-350	
10:15	7.83	180	2.00	7.10	0.0	3.87	1.49	10.8	1.0	-353	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/31/10-10:20

Total Volume of Water purged: 2.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.10	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.49	Manganese	0.00
Turbidity (NTU)	3.87	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	3892.00
Temp.(°C)	10.80	Hydrogen Sulfide	>2.25
TDS (g/L)	1.00	Alkalinty	136.00
ORP (mv)	-353.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: Collected duplicate sample PMW-10 (labeled)-10:30

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-2

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-15:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.65

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
15:00	6.65		0.0	7.63	0.81	15.10	1.77	10.9	1.1	-241	
15:05		225	0.6	7.43	0.04	11.70	1.77	10.8	1.1	-237	
15:10	7.25	225	0.6	7.26	0.0	8.24	1.76	10.8	1.1	-231	
15:15	7.28	225	0.9	7.13	0.0	6.97	1.76	10.8	1.1	-226	
15:20		225	1.2	7.10	0.0	5.46	1.76	10.9	1.1	-226	
15:25	7.31	225	1.5	7.08	0.0	5.42	1.76	10.9	1.1	-224	
15:30	7.32	225	1.8	7.05	0.0	5.04	1.76	10.9	1.1	-223	
15:35	7.32	225	2.1	7.01	0.0	4.86	1.75	11.0	1.1	-225	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.01	Ferrous Iron (mg/L)	4.0
Spec. Cond.(mS/cm)	1.75	Manganese	0.0
Turbidity (NTU)	4.86	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	3200
Temp.(°C)	11.0	Hydrogen Sulfide	0.125
TDS (g/L)	1.10	Alkalinty	136
ORP (mv)	-225	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-3

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/31/10-14:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
5.75

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:00	5.75	220	0.0	7.34	0.0	9.21	1.64	10.8	1.0	-332	
14:05		220	0.3	7.31	0.0	6.28	1.62	10.9	1.0	-338	
14:10	7.38	220	0.6	7.24	0.0	4.99	1.63	10.8	1.0	-345	
14:15	7.56	220	0.9	7.11	0.0	5.23	1.64	10.8	1.0	-353	
14:20	7.62	220	1.2	7.04	0.0	6.55	1.64	10.8	1.0	-360	
14:25	7.65	220	1.5	6.96	0.0	6.62	1.64	11.2	1.0	-365	
14:30	7.68	220	1.8	6.90	0.0	6.53	1.64	11.5	1.0	-368	
14:35	7.69	220	2.1	6.89	0.0	5.94	1.64	11.5	1.1	-371	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/31/10-14:40

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.89	Ferrous Iron (mg/L)	0.0
Spec. Cond.(mS/cm)	1.64	Manganese	0.0
Turbidity (NTU)	5.94	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	124
Temp.(°C)	11.5	Hydrogen Sulfide	2.25
TDS (g/L)	1.10	Alkalinty	170
ORP (mv)	-371.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-4

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/31/10-08:05

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.3

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:05	7.30	240	0.00	6.17	0.29	148	1.51	10.40	1.0	-1	
8:10		240	0.25	8.29	0.00	121	1.52	10.60	1.0	-72	
8:15	7.59	240	0.50	6.34	0.00	78.3	1.53	10.70	1.0	-88	
8:20		240	0.75	6.37	0.00	64.6	1.55	10.80	1.0	-100	
8:25	7.59	240	1.0	6.42	0.00	11.1	1.58	10.90	1.0	-111	
8:30	7.60	240	1.3	6.48	0.00	7.3	1.60	11.00	1.0	-125	
8:35	7.61	240	1.6	6.50	0.00	5.52	1.60	11.10	1.0	-130	
8:40	7.62	240	1.9	6.51	0.00	5.90	1.60	11.20	1.0	-132	
8:45	7.63	240	2.2	6.52	0.00	5.65	1.60	11.20	1.0	-136	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/31/10-08:50

Total Volume of Water purged: 2.2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.52	Ferrous Iron (mg/L)	1.2
Spec. Cond.(mS/cm)	1.6	Manganese	0.0
Turbidity (NTU)	5.65	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	3390
Temp.(°C)	11.20	Hydrogen Sulfide	0.0
TDS (g/L)	1.00	Alkalinty	119
ORP (mv)	-136.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-5

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/31/10-08:20

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.67

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:20	3.67	300	0.00	6.01	0.0	35.30	3.21	11.29	2.0	-292	
8:25	3.68	300	0.25	6.02	0.0	21.20	3.23	11.08	2.2	-300	
8:30	3.68	300	0.50	6.02	0.0	16.60	3.22	11.10	2.2	-302	
8:35	3.69	300	0.75	6.02	0.0	11.20	3.25	11.11	2.2	-301	
8:40	3.69	300	1.00	6.01	0.0	7.80	3.24	11.10	2.2	-301	
8:45	3.69	300	1.25	6.01	0.0	4.66	3.22	11.09	2.1	-300	
8:50	3.68	300	1.50	6.01	0.0	3.34	3.22	11.09	2.1	-301	
9:00	3.68	300	1.75	6.01	0.0	3.33	3.21	11.09	2.2	-300	
9:05	3.68	300	2.00	6.02	0.0	3.32	3.21	11.10	2.2	-300	
9:10	3.68	300	2.25	6.02	0.0	3.32	3.21	11.10	2.2	-300	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/31/10-09:10

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.02	Ferrous Iron (mg/L)	0.02
Spec. Cond.(mS/cm)	3.21	Manganese	0.01
Turbidity (NTU)	3.32	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	1648
Temp.(°C)	11.10	Hydrogen Sulfide	2.0
TDS (g/L)	2.2	Alkalinty	170
ORP (mv)	-300	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: Slight septic odor, small black particles present

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-6

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-11:25

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.88

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:25	3.88	300	0.00	6.85	0.0	24.10	2.66	11.71	1.7	-343	
11:30	3.89	300	0.50	6.56	0.0	18.10	2.49	11.70	1.6	-348	
11:35	3.89	300	1.00	6.55	0.0	13.80	2.50	11.72	1.6	-346	
11:40	3.90	300	1.25	6.56	0.0	8.62	2.50	11.73	1.6	-345	
11:45	3.90	300	1.50	6.56	0.0	3.53	2.49	11.74	1.6	-345	
11:50	3.89	300	1.75	6.56	0.0	3.74	2.49	11.74	1.6	-345	
11:55	3.89	300	2.00	6.56	0.0	3.80	2.48	11.74	1.6	-344	
12:00	3.90	300	2.25	6.55	0.0	3.74	2.48	11.73	1.6	-343	
12:05	3.90	300	2.50	6.56	0.0	3.75	2.47	11.73	1.6	-344	
12:10	3.90	300	2.75	6.56	0.0	3.74	2.47	11.73	1.5	-344	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-12:10

Total Volume of Water purged: 2.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.56	Ferrous Iron (mg/L)	0.1
Spec. Cond.(mS/cm)	2.47	Manganese	0.0
Turbidity (NTU)	3.74	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	1786
Temp.(°C)	11.73	Hydrogen Sulfide	0.50
TDS (g/L)	1.50	Alkalinity	136
ORP (mv)	-344	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-7

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 4/1/10-11:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.28

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:00	4.28	300	0.00	6.10	0.0	25.10	2.00	13.61	1.4	-343	slight septic odor
11:05	4.28	300	0.25	6.12	0.0	21.30	2.19	12.88	1.4	-353	
11:10	4.28	300	0.50	6.15	0.0	4.00	2.17	12.88	1.4	-355	
11:15	4.28	300	0.75	6.11	0.0	3.73	2.16	12.90	1.4	-356	
11:20	4.28	300	1.00	6.10	0.0	3.71	2.15	12.91	1.4	-357	
11:25	4.28	300	1.25	6.10	0.0	3.70	2.14	12.92	1.4	-356	
11:30	4.28	300	1.50	6.09	0.0	3.70	2.13	12.92	1.4	-356	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 4/1/10-11:30

Total Volume of Water purged: 1.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.09	Ferrous Iron (mg/L)	0.02
Spec. Cond.(mS/cm)	2.13	Manganese	0.40
Turbidity (NTU)	3.70	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	988
Temp.(°C)	12.92	Hydrogen Sulfide	2.00
TDS (g/L)	1.40	Alkalinty	221
ORP (mv)	-356	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-8

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.1

Method: Geopump/Low Flow Date/Time: 3/30/10-13:35

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:35	4.10										
13:40		180	0.25	7.62	0.89	8.06	0.84	11.5	0.54	-239	
13:45	4.14	180	0.50	7.51	0.0	5.42	0.81	11.8	0.52	-256	
13:50		180	0.75	6.92	0.0	3.78	1.65	12.0	1.0	-279	
13:55	4.14	180	1.00	7.02	0.0	3.36	1.69	12.1	1.0	-302	
14:00		180	1.25	7.05	0.0	3.24	1.71	12.1	1.1	-309	
14:05	4.14	180	1.50	7.05	0.0	3.18	1.72	12.2	1.1	-314	
14:10		180	1.75	7.05	0.0	3.09	1.72	12.3	1.1	-315	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-14:15

Total Volume of Water purged: 1.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.05	Ferrous Iron (mg/L)	0.2
Spec. Cond.(mS/cm)	1.72	Manganese	0.00
Turbidity (NTU)	3.09	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	2154
Temp.(°C)	12.3	Hydrogen Sulfide	>2.25
TDS (g/L)	1.1	Alkalinty	136
ORP (mv)	-315	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-9

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/30/10-10:55

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.53

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:55	3.53										
11:00	3.53	240	0.25	7.14	0.0	5.10	1.88	10.8	1.2	-322	
11:05	3.54	240	0.50	7.32	0.0	4.93	1.88	10.7	1.2	-324	
11:10	3.54	240	0.75	7.33	0.0	3.42	1.85	10.9	1.2	-331	
11:15	3.54	240	1.00	7.19	0.0	3.47	1.83	11.0	1.2	-331	
11:20	3.54	240	1.25	7.17	0.0	3.54	1.82	11.0	1.2	-333	
11:25	3.54	240	1.50	7.16	0.0	3.75	1.81	11.1	1.2	-334	
11:30	3.54	240	2.00	7.15	0.0	3.69	1.80	11.2	1.2	-335	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/30/10-11:35

Total Volume of Water purged: 2.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.15	Ferrous Iron (mg/L)	0.2
Spec. Cond.(mS/cm)	1.80	Manganese	0.0
Turbidity (NTU)	3.69	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	3032
Temp.(°C)	11.2	Hydrogen Sulfide	>2.25
TDS (g/L)	1.2	Alkalinty	153
ORP (mv)	-335	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-01

Well Diameter: 2 Inches

Samplers: Bill Adams/Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 4/1/10-13:40

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.57

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:40	6.57	200		6.87	2.7	11.50	1.57	13.6	1.0	-322	
13:45	6.86	200	0.3	6.64	0.0	8.24	1.52	12.3	1.0	-344	
13:50	6.91	200	0.6	6.63	0.0	7.97	1.49	12.1	1.0	-351	
13:55		200	1.0	6.58	0.0	9.38	1.50	12.3	1.0	-357	
14:00	6.91	200	1.3	6.53	0.0	10.12	1.51	12.4	1.0	-359	
14:05	6.83	200	1.6	6.57	0.0	9.76	1.53	12.4	1.0	-358	
14:10	6.84	200	2.0	6.54	0.0	9.97	1.54	12.7	1.0	-359	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 4/1/10-14:15

Total Volume of Water purged: 2.0 gal

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.54	Ferrous Iron (mg/L)	0.1
Spec. Cond.(mS/cm)	1.54	Manganese	0.1
Turbidity (NTU)	9.97	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	290
Temp.(°C)	12.7	Hydrogen Sulfide	0.5
TDS (g/L)	1.0	Alkalinty	170
ORP (mv)	-359	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-02

Well Diameter: 2 Inches

Samplers: Bill Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 4/1/10-10:30

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.31

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:30	6.31	200		6.99	10.23	6.75	1.59	13.0	1.0	-333	
10:35	6.63	200	0.30	6.48	0.0	9.75	1.45	12.3	0.9	-354	
10:40		200	0.60	6.45	0.0	9.55	1.47	12.4	0.9	-362	
10:45	6.66	200	1.00	6.44	0.0	8.61	1.51	12.4	1.0	-364	
10:50	6.67	200	1.30	6.42	0.0	11.40	1.57	12.6	1.0	-365	
10:55	6.68	200	1.50	6.39	0.0	10.58	1.60	12.7	1.0	-366	
11:00		200	1.75	6.38	0.0	9.23	1.61	12.7	1.0	-366	
11:05	6.70	200	2.00	6.37	0.0	8.74	1.62	12.8	1.0	-367	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 4/1/10-11:10

Total Volume of Water purged: 2.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.37	Ferrous Iron (mg/L)	
Spec. Cond.(mS/cm)	1.62	Manganese	0.00
Turbidity (NTU)	8.74	Sulfate	n/a
DO (mg/L)	0.0	Carbon Dioxide	2156
Temp.(°C)	12.8	Hydrogen Sulfide	2.125
TDS (g/L)	1.0	Alkalinty	170
ORP (mv)	-367	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-03

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 3/31/10-10:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:00	4.00	300	0.00	6.02	0.0	310.0	3.24	12.00	2.1	-300	
10:05	4.12	300	0.25	6.15	0.0	85.0	3.26	11.98	2.1	-304	
10:10	4.13	300	0.50	6.13	0.0	44.8	3.26	11.97	2.1	-304	
10:15	4.13	300	0.75	6.11	0.0	34.0	3.28	11.99	2.1	-305	
10:20	4.13	300	1.00	6.12	0.0	23.2	3.28	11.97	2.1	-306	
10:25	4.12	250	1.15	6.11	0.0	21.0	3.29	11.97	2.2	-307	
10:30	4.12	250	1.35	6.10	0.0	20.0	3.30	11.98	2.2	-308	
10:35	4.12	250	1.65	6.09	0.0	18.0	3.31	11.98	2.2	-309	
10:40	4.13	250	1.90	6.10	0.0	17.0	3.32	11.99	2.2	-309	
10:45	4.12	250	2.20	6.09	0.0	18.0	3.32	11.99	2.2	-308	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/31/10-10:45

Total Volume of Water purged: 2.2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.09	Ferrous Iron (mg/L)	0.08
Spec. Cond.(mS/cm)	3.32	Manganese	0.20
Turbidity (NTU)	18.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	609*
Temp.(°C)	11.99	Hydrogen Sulfide	2.0
TDS (g/L)	2.20	Alkalinty	204
ORP (mv)	-308.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP

Comments: *turned grey rather than pink

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-04

Well Diameter: 2 Inches

Samplers: Lauren Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 4/1/10-09:45

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.25

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:45	4.25	250	0.00	6.15	0.0	8.00	3.04	13.08	2.0	-255	
9:50	4.24	250	0.15	6.11	0.0	8.00	3.06	13.01	2.0	-256	
9:55	4.24	250	0.45	6.12	0.0	6.67	3.07	12.98	2.0	-255	
10:00	4.24	250	0.75	6.11	0.0	6.53	3.09	12.90	2.0	-256	
10:05	4.25	250	1.15	6.10	0.0	6.15	3.10	12.89	2.0	-256	
10:10	4.25	250	1.45	6.10	0.0	6.03	3.11	12.90	2.0	-257	
10:15	4.25	250	1.85	6.11	0.0	6.01	3.12	12.91	2.0	-257	
10:20	4.25	250	2.05	6.12	0.0	6.00	3.11	12.92	2.0	-258	
10:25	4.25	250	2.35	6.11	0.0	6.01	3.12	12.92	2.0	-258	
10:30	4.25	250	2.65	6.12	0.0	6.01	3.11	12.91	2.0	-257	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 4/1/10-10:30

Total Volume of Water purged: 2.65 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.12	Ferrous Iron (mg/L)	1.0
Spec. Cond.(mS/cm)	3.11	Manganese	0.0
Turbidity (NTU)	6.01	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	599*
Temp.(°C)	12.91	Hydrogen Sulfide	2.0
TDS (g/L)	2.0	Alkalinty	221
ORP (mv)	-257	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	Lab SOP

Comments: *turned grey rather than pink

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7A

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/6/10-08:55

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
7.12	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:55	7.12		0.00								
9:00		260.00	0.40	7.07	0.00	24.80	1.590	11.00	1.00	-305	
9:05			0.80	7.16	0.00	15.20	1.570	11.20	1.00	-325	
9:10	11.20	200.00	1.20	7.23	0.00	6.57	1.560	11.40	1.00	-331	
9:15			1.50	7.24	0.00	5.21	1.560	11.40	1.00	-337	
9:20		120.00	1.90	7.25	0.00	4.83	1.550	11.50	1.00	-340	
9:25	12.30	120.00	2.20	7.25	0.00	3.50	1.550	11.50	1.00	-341	
9:30	12.45	120.00	2.50	7.25	0.00	3.42	1.560	11.50	1.00	-341	
9:35	12.54	120.00	2.80	7.24	0.00	2.40	1.570	11.50	1.00	-340	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/6/10-09:40

Total Volume of Water purged: 3.2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.24	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.57	Manganese	0.00
Turbidity (NTU)	2.40	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	394.00
Temp.(°C)	11.50	Hydrogen Sulfide	>2.25
TDS (g/L)	1.00	Alkalinty	153.00
ORP (mv)	-340.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Microbials	1 Filter	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-7B

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/6/10-12:35

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:35		140.00	0.00	7.41	2.48		1.940	12.60	1.20	-323	
12:40	8.24	140.00	0.30	7.56	0.00	47.00	1.860	12.60	1.20	-335	
12:45	8.30	140.00	0.60	7.49	0.00	31.00	1.870	12.80	1.20	-340	
12:50		140.00	1.00	7.48	0.00	25.00	1.870	12.60	1.20	-343	
12:55	8.33	140.00	1.30	7.44	0.00	18.00	1.870	12.30	1.20	-345	
13:00	8.29	140.00	1.70	7.44	0.00	23.00	1.860	12.40	1.20	-346	
13:05		140.00	2.00	7.42	0.00	16.00	1.870	12.70	1.20	-348	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/6/10-13:10

Total Volume of Water purged: 2.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.42	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.87	Manganese	0.00
Turbidity (NTU)	16.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	408.00
Temp.(°C)	12.70	Hydrogen Sulfide	2.25
TDS (g/L)	1.20	Alkalinty	92.00
ORP (mv)	-348.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	SW6010B

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-10B

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/6/10-14:45

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:45	8.66	180.00	0.00	7.68	8.00	2.41	1.940	13.40	1.20	-146	
14:50		180.00	0.30	7.53	0.28	2.50	1.840	13.40	1.20	-146	
14:55	8.68	180.00	0.60	7.35	0.00	0.20	1.790	13.60	1.10	-151	
15:00		180.00	0.90	7.32	0.00	0.18	1.800	13.30	1.10	-150	
15:05	8.67	180.00	1.20	7.31	0.00	0.13	1.790	13.50	1.10	-152	
15:10	8.67	180.00	1.50	7.27	0.00	0.15	1.780	13.30	1.10	-151	
15:15	8.67	180.00	1.80	7.25	0.00	0.12	1.770	13.30	1.10	-152	
15:20	8.67	180.00	2.10	7.25	0.00	0.12	1.770	13.30	1.10	-152	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/6/10-15:30

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.25	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	1.77	Manganese	0.00
Turbidity (NTU)	0.12	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	436.00
Temp.(°C)	13.30	Hydrogen Sulfide	0.10
TDS (g/L)	1.10	Alkalinty	153.00
ORP (mv)	-152.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-11B

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/6/10-14:55

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
8.34	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:55	8.34	275.00	0.00	7.24	0.20	19.90	1.870	12.40	1.20	-358	
15:00	8.35	275.00	0.25	7.19	0.00	19.20	1.850	12.30	1.20	-359	
15:05	8.34	275.00	0.50	7.13	0.00	18.00	1.840	12.40	1.20	-361	
15:10	8.34	275.00	0.75	7.11	0.00	16.30	1.830	12.30	1.20	-362	
15:15	8.35	275.00	1.00	7.09	0.00	15.90	1.830	12.40	1.20	-363	
15:20	8.34	275.00	1.25	7.09	0.00	6.30	1.840	12.40	1.20	-362	
15:25	8.35	275.00	1.50	7.08	0.00	3.30	1.830	12.30	1.20	-363	
15:30	8.35	275.00	1.75	7.08	0.00	3.00	1.830	12.40	1.20	-364	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/6/10-15:35

Total Volume of Water purged: 1.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.08	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.83	Manganese	0.00
Turbidity (NTU)	3.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	*232
Temp.(°C)	12.40	Hydrogen Sulfide	5.00
TDS (g/L)	1.20	Alkalinty	255.00
ORP (mv)	-364.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: * turned grey not pink

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17A

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/6/10-09:00

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.35	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:30	4.36	275.00	0.00	6.92	0.00	40.00	7.590	11.90	5.10	-79	
9:35	4.41	275.00	0.25	6.81	0.00	22.00	9.900	11.90	5.20	-75	
9:40	4.42	275.00	0.50	6.78	0.00	17.00	9.900	11.89	5.30	-99	
9:45	4.41	275.00	0.75	6.76	0.00	11.00	63.100	11.90	36.00	-92	
9:50	4.42	275.00	1.00	6.76	0.00	7.00	62.800	11.90	35.00	-93	
9:55	4.43	275.00	1.25	6.77	0.00	6.00	62.500	11.91	36.00	-92	
10:00	4.44	275.00	1.50	6.76	0.00	5.00	44.000	11.90	29.00	-93	
10:05	4.43	275.00	1.75	6.77	0.00	5.00	42.000	11.90	28.00	-94	
10:10	4.43	275.00	2.00	6.76	0.00	6.00	43.000	11.91	29.00	-94	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/6/10-10:15

Total Volume of Water purged: 2.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.76	Ferrous Iron (mg/L)	2.00
Spec. Cond.(mS/cm)	43.00	Manganese	0.00
Turbidity (NTU)	6.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	*530
Temp.(°C)	11.91	Hydrogen Sulfide	0.10
TDS (g/L)	29.00	Alkalinty	258.00
ORP (mv)	-94.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: water was very turbid at start and pump filled with sediment. *turned grey not pink

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-17B

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/6/10-12:50

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.8	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:50	4.80	250.00	0.00	6.86	0.00	35.30	2.670	13.10	2.50	-309	
12:55	4.83	250.00	0.25	6.85	0.00	33.00	2.650	13.00	2.50	-310	
13:00	4.84	250.00	0.50	6.83	0.00	18.00	2.660	12.90	2.60	-307	
13:05	4.85	250.00	0.75	6.81	0.00	16.50	3.950	13.00	2.70	-306	
13:10	4.85	250.00	1.00	6.80	0.00	15.00	4.010	13.10	2.60	-307	
13:15	4.85	250.00	1.25	6.79	0.00	11.00	4.000	13.00	2.70	-308	
13:20	4.85	250.00	1.50	6.79	0.00	6.10	4.010	13.10	2.70	-309	
13:25	4.85	250.00	1.75	6.79	0.00	6.10	4.000	13.10	2.60	-310	
13:30	4.86	250.00	2.00	6.78	0.00	6.00	4.000	13.00	2.50	-309	
13:35	4.85	250.00	2.25	6.78	0.00	6.00	4.010	13.00	2.60	-310	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/6/10-13:40

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.78	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	4.01	Manganese	0.00
Turbidity (NTU)	6.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	494.00
Temp.(°C)	13.00	Hydrogen Sulfide	2.00
TDS (g/L)	2.60	Alkalinty	289.00
ORP (mv)	-310.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	SW6010B
Microbials	1 Filter	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-1

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-08:05

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
6.45	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:05	6.45	250.00	0.00	6.72	0.00	0.00	1.360	10.90	0.90	-292	
8:10	6.46	250.00	0.20	6.71	0.00	0.00	1.310	10.90	0.80	-303	
8:15	6.46	250.00	0.45	6.70	0.00	0.00	1.280	10.90	0.80	-305	
8:20	6.47	250.00	0.65	6.68	0.00	0.00	1.260	11.00	0.80	-328	
8:25	6.47	250.00	0.85	6.67	0.00	0.00	1.260	11.00	0.80	-329	
8:30	6.46	250.00	1.10	6.68	0.00	0.00	1.270	11.10	0.80	-351	
8:35	6.46	250.00	1.30	6.68	0.00	0.00	1.260	11.10	0.80	-362	
8:40	6.46	250.00	1.55	6.67	0.00	0.00	1.270	11.10	0.80	-363	
8:45	6.46	250.00	1.80	6.66	0.00	0.00	1.260	11.20	0.80	-361	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-08:50

Total Volume of Water purged: 1.8 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.66	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.26	Manganese	0.00
Turbidity (NTU)	0.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	548.00
Temp.(°C)	11.20	Hydrogen Sulfide	5.00
TDS (g/L)	0.80	Alkalinty	187.00
ORP (mv)	-361.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-2

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-12:10

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:05	6.96	200.00	0.00	7.08	4.06	9.10	1.770	11.10	1.10	-262	
12:10	7.84	200.00	0.25	6.89	0.25	15.20	1.790	11.10	1.10	-235	
12:15		160.00	0.50	6.84	0.02	12.60	1.780	11.20	1.10	-231	reduced flow rate to stop drawdown
12:20	7.83	160.00	0.65	6.81	0.00	10.40	1.780	11.20	1.10	-230	of DTW
12:25		160.00	0.80	6.75	0.00	13.10	1.760	11.20	1.10	-232	
12:30	7.88	160.00	1.00	6.73	0.00	9.80	1.760	11.20	1.10	-232	
12:35	7.90	160.00	1.25	6.71	0.00	10.60	1.750	11.10	1.10	-233	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-12:45

Total Volume of Water purged: 1.0 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.71	Ferrous Iron (mg/L)	425.00
Spec. Cond.(mS/cm)	1.75	Manganese	0.00
Turbidity (NTU)	10.60	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	794.00
Temp.(°C)	11.10	Hydrogen Sulfide	*0
TDS (g/L)	1.10	Alkalinty	153.00
ORP (mv)	-233.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060

Comments: *turned pink not blue

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-3

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-7:55

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
7:55	6.48	200.00	0.00	6.22	2.01	3.80	1.600	10.60	1.00	-314	
8:00		200.00	0.30	6.43	0.20	2.50	1.580	10.60	1.00	-327	
8:05	8.12	150.00	0.60	6.53	0.00	1.20	1.580	10.70	1.00	-342	reduced flow rate to stop drawdown
8:10	8.04	150.00	0.80	6.54	0.00	3.60	1.590	10.80	1.00	-343	of water level
8:15	8.02	150.00	1.10	6.53	0.00	3.40	1.600	10.90	1.00	-344	
8:20		150.00	1.40	6.52	0.00	2.80	1.600	10.90	1.00	-346	
8:25	8.04	150.00	1.60	6.53	0.00	2.40	1.590	11.10	1.00	-346	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-8:35

Total Volume of Water purged: 1.6 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.53	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.59	Manganese	0.00
Turbidity (NTU)	2.40	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	528.00
Temp.(°C)	11.10	Hydrogen Sulfide	2.00
TDS (g/L)	1.00	Alkalinty	170.00
ORP (mv)	-346.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	SW6010B
Microbials	1 Filter	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-4

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/10/10-11:10

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.85

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:10	7.85	250.00	0.00	6.09	1.80	25.00	1.600	11.70	1.00	-71	
11:15	7.90	250.00	0.25	6.52	0.00	24.10	1.600	11.70	1.10	-93	
11:20	7.91	250.00	0.50	6.65	0.00	10.30	1.600	11.70	1.10	-96	
11:25	7.91	250.00	0.75	6.66	0.00	6.70	1.600	11.80	1.10	-98	
11:30	7.91	250.00	1.00	6.67	0.00	6.30	1.600	11.70	1.10	-98	
11:35	7.91	250.00	1.25	6.67	0.00	6.10	1.600	11.80	1.10	-99	
11:40	7.90	250.00	1.50	6.66	0.00	6.00	1.600	11.80	1.10	-99	
11:45	7.90	250.00	1.75	6.67	0.00	6.00	1.600	11.80	1.10	-99	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/10/10-11:45

Total Volume of Water purged: 1.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.67	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	1.60	Manganese	0.00
Turbidity (NTU)	6.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	594.00
Temp.(°C)	11.80	Hydrogen Sulfide	0.00
TDS (g/L)	1.10	Alkalinty	153.00
ORP (mv)	-99.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-5

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-9:15

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:15	4.43	220.00	0.00	7.17	10.27	12.00	2.600	12.50	1.80	-271	
9:20	4.48	220.00	0.25	5.74	0.00	7.40	3.400	12.50	2.20	-308	
9:25	4.47	220.00	0.70	5.73	0.00	4.10	3.380	12.50	2.20	-310	
9:30	4.48	220.00	0.90	5.74	0.00	2.70	3.330	12.60	2.10	-311	
9:35	4.47	220.00	1.10	5.76	0.00	1.10	3.280	12.60	2.10	-312	
9:40	4.46	220.00	1.30	5.80	0.00	1.20	3.280	12.60	2.00	-314	
9:45	4.45	220.00	1.60	5.82	0.00	1.40	3.260	12.70	2.00	-315	
9:50	4.45	220.00	1.80	5.82	0.00	1.20	3.240	12.60	2.00	-315	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-10:00

Total Volume of Water purged: 1.8 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	5.82	Ferrous Iron (mg/L)	0.10
Spec. Cond.(mS/cm)	3.24	Manganese	0.70
Turbidity (NTU)	1.20	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	526.00
Temp.(°C)	12.60	Hydrogen Sulfide	2.50
TDS (g/L)	2.00	Alkalinty	255.00
ORP (mv)	-315.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP
Dissolved Inorganics	1-500mL plastic	None	SW6010B
Microbials	1 Filter	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-6

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-09:25

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.65	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
9:25	4.65	250.00	0.00	6.78	0.00	40.00	2.400	13.20	1.50	-351	
9:30	4.64	250.00	0.25	6.59	0.00	23.00	2.400	13.10	1.60	-353	
9:35	4.63	250.00	0.55	6.58	0.00	7.60	2.400	13.40	1.50	-352	
9:40	4.62	250.00	0.85	6.57	0.00	5.10	2.400	13.50	1.60	-352	
9:45	4.62	250.00	1.15	6.56	0.00	4.20	2.400	13.50	1.60	-351	
9:50	4.63	250.00	1.35	6.55	0.00	3.20	2.500	13.60	1.60	-350	
9:55	4.62	250.00	1.60	6.54	0.00	3.10	2.500	13.60	1.60	-349	
10:00	4.62	250.00	1.95	6.54	0.00	3.00	2.500	13.60	1.60	-349	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-10:05

Total Volume of Water purged: 1.95 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.54	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	2.50	Manganese	*0.8
Turbidity (NTU)	3.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	562.00
Temp.(°C)	13.60	Hydrogen Sulfide	5.00
TDS (g/L)	1.60	Alkalinty	255.00
ORP (mv)	-349.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: *turned orange, not pink

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-7

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-10:50

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.96	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:50	4.96	250.00	0.00	7.18	0.00	2.80	2.600	13.00	1.70	-345	
10:55	4.97	250.00	0.25	7.16	0.00	2.60	2.600	13.10	1.60	-343	
11:00	4.98	250.00	0.50	7.11	0.00	2.60	2.700	12.90	1.60	-344	
11:05	4.98	250.00	0.80	6.99	0.00	2.40	2.700	12.90	1.70	-345	
11:10	4.98	250.00	1.05	6.88	0.00	2.30	2.700	12.90	1.80	-345	
11:15	4.98	250.00	1.35	6.78	0.00	2.40	2.690	12.90	1.70	-345	
11:20	4.98	250.00	1.65	6.77	0.00	2.50	2.700	12.80	1.70	-345	
11:25	4.97	250.00	2.00	6.77	0.00	2.50	2.600	12.80	1.60	-344	
11:30	4.98	250.00	2.25	6.76	0.00	2.50	2.600	12.70	1.60	-345	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-11:35

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.76	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	2.60	Manganese	*0.1
Turbidity (NTU)	2.50	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	542.00
Temp.(°C)	12.70	Hydrogen Sulfide	2.00
TDS (g/L)	1.60	Alkalinty	204.00
ORP (mv)	-345.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: *turned orange not pink

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-8

Well Diameter: 2 Inches

Samplers: B. Adams

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot

Method: Geopump/Low Flow Date/Time: 5/7/10-11:00

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:00	4.86	230.00	0.00	7.29	0.77	10.80	1.260	13.00	0.80	-293	
11:05		200.00	0.25	7.45	0.12	10.40	1.220	12.90	0.70	-298	reduced flow rate
11:10	4.88	200.00	0.50	7.87	0.00	9.30	1.150	12.80	0.70	-317	
11:15	4.88	200.00	0.75	7.99	0.00	8.70	1.130	12.70	0.70	-321	
11:20		200.00	1.00	7.27	0.00	10.30	1.580	12.70	1.00	-297	
11:25	4.88	200.00	1.25	7.24	0.00	9.70	1.590	12.80	1.00	-300	
11:30	4.88	200.00	1.50	7.25	0.00	8.90	1.590	12.70	1.00	-302	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-11:40

Total Volume of Water purged: 1.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.25	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.59	Manganese	0.00
Turbidity (NTU)	8.90	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	397.00
Temp.(°C)	12.70	Hydrogen Sulfide	1.75
TDS (g/L)	1.00	Alkalinty	119.00
ORP (mv)	-302.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: PMW-9

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/7/10-12:10

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.4

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:10	4.40	250.00	0.00	7.63	0.00	3.10	1.600	11.60	1.00	-308	
12:15	4.41	250.00	0.25	7.32	0.00	1.50	1.600	11.90	1.10	-310	
12:20	4.40	250.00	0.55	7.30	0.00	1.30	1.700	11.90	1.10	-311	
12:25	4.39	250.00	0.85	7.10	0.00	1.00	1.700	11.90	1.10	-311	
12:30	4.38	250.00	1.15	7.09	0.00	1.00	1.600	11.90	1.10	-312	
12:35	4.38	250.00	1.45	7.08	0.00	1.10	1.600	12.00	1.10	-311	
12:40	4.38	250.00	1.75	7.07	0.00	1.00	1.600	12.00	1.10	-311	
12:45	4.39	250.00	2.10	7.06	0.00	1.00	1.600	12.00	1.10	-310	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/7/10-12:50

Total Volume of Water purged: 2.1 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.06	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.60	Manganese	0.00
Turbidity (NTU)	1.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	582.00
Temp.(°C)	12.00	Hydrogen Sulfide	0.30
TDS (g/L)	1.10	Alkalinty	170.00
ORP (mv)	-310.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
VFA	2-40mL glass	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-01

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/10/10-11:05

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.67

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
11:05	6.67	250.00	0.00	6.73	1.10	10.80	1.540	11.60	1.00	-305	
11:10	7.40	250.00	1.25	7.05	0.00	3.50	1.510	11.50	1.00	-333	clear
11:15	7.38	250.00	2.50	7.10	0.00	3.20	1.510	11.50	1.00	-349	
11:20	7.38	250.00	3.75	7.16	0.00	2.70	1.520	11.50	1.00	-355	
11:25	7.38	250.00	5.00	7.19	0.00	2.80	1.540	11.60	1.00	-358	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/10/10-11:30

Total Volume of Water purged: 2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.19	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.55	Manganese	0.50
Turbidity (NTU)	2.90	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	562.00
Temp.(°C)	11.60	Hydrogen Sulfide	5.00
TDS (g/L)	1.00	Alkalinty	255.00
ORP (mv)	-359.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Microbials	1 Filter	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-02

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/10/10-12:05

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
6.89	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
12:05	6.89	200.00	0.00	6.85	0.00	3.10	1.520	12.50	1.00	-350	clear
12:10	7.14	200.00	1.00	7.70	0.00	3.20	1.480	12.20	0.90	-359	
12:15	7.14	200.00	2.00	7.58	0.00	2.80	1.500	12.00	1.00	-365	
12:20	7.14	200.00	3.00	7.54	0.00	2.30	1.540	12.10	1.00	-365	stable
12:25	7.14	200.00	4.00	7.52	0.00	2.50	1.560	12.10	1.00	-365	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/10/10-12:30

Total Volume of Water purged: 4 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.52	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.56	Manganese	0.30
Turbidity (NTU)	2.50	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	554.00
Temp.(°C)	12.10	Hydrogen Sulfide	2.00
TDS (g/L)	1.00	Alkalinty	170.00
ORP (mv)	-365.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	SW6010B

Comments: Ran dup. INJ-01, MS and MSD

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-03

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/10/10-14:45

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.52	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
14:45	4.52	300.00	0.00	6.84	4.90	>2000	2.580	13.40	1.60	-233	cloudy/milky
14:50	4.91	300.00	1.50	6.49	0.00	1100.00	2.410	13.40	1.50	-289	
14:55	4.92	300.00	3.00	6.32	0.00	750.00	2.510	13.40	1.60	-299	
15:00	4.96	300.00	4.50	6.27	0.28	330.00	2.840	13.60	1.80	-308	
15:05	4.90	200.00	5.50	6.26	1.11	280.00	3.090	13.70	2.00	-308	
15:10	4.89	200.00	6.50	6.27	1.58	150.00	3.220	13.60	2.10	-309	
15:15	4.90	200.00	7.50	6.28	1.62	65.00	3.410	13.70	2.20	-311	
15:20	4.90	200.00	8.50	6.28	1.30	45.00	3.570	13.60	2.30	-312	mostly clear
15:25	4.92	200.00	9.50	6.28	0.68	40.00	3.590	13.60	2.30	-312	
15:30	4.92	200.00	10.50	6.27	0.66	40.00	3.610	13.60	2.40	-311	stable

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/10/10-15:40

Total Volume of Water purged: 10.5 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.27	Ferrous Iron (mg/L)	1.20
Spec. Cond.(mS/cm)	3.61	Manganese	0.30
Turbidity (NTU)	40.00	Sulfate	n/a
DO (mg/L)	0.66	Carbon Dioxide	584.00
Temp.(°C)	13.60	Hydrogen Sulfide	5.00
TDS (g/L)	2.40	Alkalinty	187.00
ORP (mv)	-311.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Microbials	1 Filter	None	Lab SOP

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: INJ-04

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/10/10-14:45

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.9

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:45	4.90	250.00	0.00	6.60	1.20	16.00	2.900	13.10	1.90	-181	
14:50	4.89	250.00	0.25	6.52	0.20	8.84	2.900	13.20	1.90	-236	
14:55	4.89	250.00	0.50	6.51	0.00	8.81	2.900	13.20	1.90	-237	
15:00	4.90	250.00	0.75	6.50	0.00	8.01	2.900	13.30	1.90	-237	
15:05	4.90	250.00	1.00	6.50	0.00	8.00	2.900	13.20	1.90	-237	
15:10	4.90	250.00	1.25	6.50	0.00	7.99	2.900	13.30	1.90	-236	
15:15	4.90	250.00	1.50	6.50	0.00	7.98	2.900	13.30	1.90	-237	
15:20	4.90	250.00	1.75	6.50	0.00	7.99	2.900	13.30	1.90	-237	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/10/10-15:25

Total Volume of Water purged: 1.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.50	Ferrous Iron (mg/L)	0.80
Spec. Cond.(mS/cm)	2.90	Manganese	0.30
Turbidity (NTU)	7.99	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	580.00
Temp.(°C)	13.30	Hydrogen Sulfide	2.00
TDS (g/L)	1.90	Alkalinty	187.00
ORP (mv)	-237.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Bromide/Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-120mL amber	H3PO4	SW9060
Dissolved Inorganics	1-500mL plastic	None	SW6010B

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-2A

Well Diameter: 2 Inches

Samplers: L.Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-08:25

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
5.55

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
8:25	5.55	275.00	0.00	6.00	2.20	6.30	1.600	10.40	1.10	-24	
8:30	5.56	275.00	0.25	6.42	0.16	4.80	1.600	10.40	1.10	-64	
8:35	5.56	275.00	0.55	6.64	0.00	2.70	1.600	10.40	1.10	-80	
8:40	5.57	275.00	0.85	6.77	0.00	1.90	1.600	10.50	1.10	-91	
8:45	5.56	275.00	1.15	6.88	0.00	1.90	1.600	10.50	1.10	-106	
8:50	5.57	275.00	1.50	6.94	0.00	1.90	1.600	10.50	1.00	-107	
8:55	5.57	275.00	1.80	6.95	0.00	1.90	1.600	10.60	1.00	-107	
9:00	5.57	275.00	2.05	6.95	0.00	1.90	1.600	10.60	1.00	-107	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-09:05

Total Volume of Water purged: 2.05 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.95	Ferrous Iron (mg/L)	1.40
Spec. Cond.(mS/cm)	1.60	Manganese	0.00
Turbidity (NTU)	1.90	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	562.00
Temp.(°C)	10.60	Hydrogen Sulfide	0.10
TDS (g/L)	1.00	Alkalinty	119.00
ORP (mv)	-107.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-2B

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-08:25

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
7.32

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
8:25	7.32	200.00	0.00	6.06	5.60	18.00	1.810	11.20	1.20	-213	
8:30	7.48	200.00	1.00	7.31	0.00	15.00	2.180	11.30	1.40	-286	
8:35	7.48	200.00	2.00	7.66	0.00	9.10	2.110	11.30	1.30	-300	
8:40	7.48	200.00	3.00	7.69	0.00	6.30	2.010	11.40	1.30	-320	
8:45	7.50	200.00	4.00	7.71	0.00	4.70	1.830	11.60	1.20	-331	
8:50	7.50	200.00	5.00	7.73	0.00	5.10	1.820	11.60	1.20	-336	stable

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-09:00

Total Volume of Water purged: 5 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.73	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.81	Manganese	0.00
Turbidity (NTU)	3.50	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	180.00
Temp.(°C)	11.60	Hydrogen Sulfide	5.00
TDS (g/L)	1.20	Alkalinty	136.00
ORP (mv)	-338.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-4A

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/14/10-09:05

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
3.11	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
9:05	3.11	200.00	0.00	6.05	3.72	11.20	1.640	12.00	1.00	67	
9:10	4.08	200.00	1.00	6.53	0.00	8.35	1.600	11.80	1.00	13	
9:15	4.18	200.00	2.00	6.87	0.00	7.87	1.580	11.70	1.00	-37	
9:20	4.24	200.00	3.00	7.05	0.00	5.41	1.580	11.80	1.00	-52	
9:25	4.30	200.00	4.00	7.18	0.00	3.42	1.570	12.00	1.00	-63	10%ORP=6
9:30	4.33	200.00	5.00	7.27	0.00	3.81	1.590	11.80	1.00	-71	
9:35	4.35	200.00	6.00	7.34	0.00	2.32	1.590	11.90	1.00	-74	
9:40	4.35	200.00	7.00	7.37	0.00	2.16	1.590	11.80	1.00	-80	
9:45	4.35	200.00	8.00	7.37	0.00	2.15	1.590	11.80	1.00	-80	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/14/10-09:45

Total Volume of Water purged: 8 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.37	Ferrous Iron (mg/L)	0.80
Spec. Cond.(mS/cm)	1.59	Manganese	0.00
Turbidity (NTU)	2.15	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	26.00
Temp.(°C)	11.80	Hydrogen Sulfide	0.00
TDS (g/L)	1.00	Alkalinity	306.00
ORP (mv)	-80.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-4B

Well Diameter: 2 Inches

Samplers: DC Burkert, L.Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/14/10-10:10

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
2.97	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:10	2.97	250.00	0.00	7.50	1.30	1.84	1.980	12.40	1.30	-87	
10:15	2.98	250.00	0.40	7.47	0.00	1.78	1.950	12.50	1.20	-107	
10:20	2.98	250.00	0.85	7.46	0.00	0.78	1.940	12.60	1.20	-117	
10:25	2.98	250.00	1.10	7.47	0.00	0.71	1.930	12.60	1.20	-122	
10:30	2.98	250.00	1.50	7.47	0.00	0.70	1.920	12.60	1.20	-126	
10:35	2.98	250.00	1.75	7.48	0.00	0.69	1.920	12.60	1.20	-128	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/14/10-10:40

Total Volume of Water purged: 1.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.48	Ferrous Iron (mg/L)	0.60
Spec. Cond.(mS/cm)	1.92	Manganese	0.00
Turbidity (NTU)	0.69	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	526.00
Temp.(°C)	12.60	Hydrogen Sulfide	0.00
TDS (g/L)	1.20	Alkalinity	170.00
ORP (mv)	-128.00	* NOTE - HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Choride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-5A

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/13/10-13:55

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
9.87	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:55	9.87	275.00	0.00	7.52	3.40	63.30	1.600	11.40	1.00	-113	
14:00	9.91	275.00	0.25	7.58	2.50	60.00	1.600	11.40	1.00	-115	
14:05	9.90	275.00	0.55	7.56	1.10	46.30	1.600	11.40	1.00	-117	
14:10	9.91	275.00	0.90	7.57	0.00	40.00	1.600	11.50	1.00	-120	
14:15	9.91	275.00	1.15	7.50	0.00	38.00	1.600	11.50	1.10	-121	
14:20	9.91	275.00	1.30	7.50	0.00	37.90	1.600	11.50	1.10	-121	
14:25	9.91	275.00	1.60	7.50	0.00	26.00	1.600	11.50	1.00	-120	
14:30	9.90	275.00	2.00	7.50	0.00	25.00	1.600	11.50	1.00	-120	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/13/10-14:35

Total Volume of Water purged: 2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.50	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.60	Manganese	0.00
Turbidity (NTU)	25.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	582.00
Temp.(°C)	11.50	Hydrogen Sulfide	0.00
TDS (g/L)	1.00	Alkalinity	170.00
ORP (mv)	-120.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-5B

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/13/10-13:40

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
9.46	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
13:40	9.46	300.00	0.00	7.79	0.53	57.20	1.780	12.30	1.10	-91	
13:45	9.50	300.00	1.50	7.67	0.00	17.30	1.760	12.10	1.10	-92	
13:50	9.50	300.00	3.00	7.61	0.00	7.41	1.750	12.20	1.10	-78	
13:55	9.48	300.00	4.50	7.58	0.00	5.72	1.740	12.20	1.10	-77	
14:00	9.48	300.00	6.00	7.57	0.00	4.54	1.730	12.30	1.10	-78	
14:05	9.48	300.00	7.50	7.56	0.00	2.48	1.710	12.30	1.10	-78	
14:10	9.48	300.00	9.00	7.56	0.00	2.75	1.700	12.70	1.10	-76	
								12.90			

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/10-14:15

Total Volume of Water purged: 9 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.57	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.68	Manganese	0.00
Turbidity (NTU)	4.08	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	542.00
Temp.(°C)	12.90	Hydrogen Sulfide	0.00
TDS (g/L)	1.10	Alkalinty	221.00
ORP (mv)	-76.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Choride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-6

Well Diameter: 2 Inches

Samplers: DC Burkert

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/12/10-10:20

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
7.06	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
10:20	7.06	300.00	0.00	7.59	9.39	4.22	1.930	10.80	1.50	-274	
10:25	7.08	300.00	1.50	7.41	0.00	2.95	2.010	11.10	1.30	-314	
10:30	7.08	300.00	3.00	7.53	0.00	2.65	1.810	11.20	1.20	-308	
10:35	7.08	300.00	4.50	7.54	0.00	2.80	1.800	11.20	1.20	-312	
10:40	7.08	300.00	6.00	7.54	0.00	2.78	1.800	11.30	1.20	-314	stable

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/12/10-10:45

Total Volume of Water purged: 6 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.53	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.80	Manganese	0.00
Turbidity (NTU)	2.75	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	600.00
Temp.(°C)	11.30	Hydrogen Sulfide	1.50
TDS (g/L)	1.20	Alkalinty	119.00
ORP (mv)	-315.00	* NOTE - HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Choride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-8

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/12/10-13:30

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
10.32	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
13:30	10.32	300.00	0.00	7.94	6.45	8.82	1.910	11.10	1.20	-108	clear
13:35	10.36	300.00	1.50	7.67	0.00	2.63	1.820	11.20	1.20	-132	
13:40	10.38	300.00	3.00	7.62	0.00	2.57	1.810	11.20	1.20	-149	
13:45	10.38	300.00	4.50	7.60	0.00	1.87	1.820	11.20	1.20	-181	
13:50	10.38	300.00	6.00	7.57	0.00	3.44	1.830	11.20	1.20	-219	
13:55	10.38	300.00	7.50	7.55	0.00	2.05	1.850	11.30	1.21	-242	
14:00	10.38	300.00	9.00	7.54	0.00	2.67	1.850	11.30	1.20	-256	
14:05	10.38	300.00	10.50	7.54	0.00	2.44	1.860	11.30	1.20	-264	stable
14:10	10.38	300.00	12.00	7.52	0.00	2.42	1.870	11.40	1.20	-272	ok

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/12/10-14:15

Total Volume of Water purged: 12 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.52	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.87	Manganese	0.00
Turbidity (NTU)	2.43	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	624.00
Temp.(°C)	11.40	Hydrogen Sulfide	1.00
TDS (g/L)	1.20	Alkalinty	49.00
ORP (mv)	273.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-10A

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-10:00

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
9.15	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:00	9.15	275.00	0.00	7.10	3.80	113.00	4.200	11.80	2.70	-63	
10:05	9.16	275.00	0.30	7.08	0.00	111.00	3.800	11.60	2.50	-59	
10:10	9.17	275.00	0.65	7.07	0.00	109.00	3.800	11.60	2.40	-60	
10:15	9.17	275.00	1.00	7.06	0.00	55.00	3.700	11.60	2.40	-61	
10:20	9.16	275.00	1.30	7.07	0.00	31.00	3.700	11.60	2.40	-69	
10:25	9.16	275.00	1.65	7.07	0.00	23.00	3.700	11.60	2.40	-71	
10:30	9.16	275.00	2.00	7.07	0.00	15.00	3.700	11.60	2.40	-72	
10:35	9.17	275.00	2.30	7.07	0.00	11.00	3.700	11.60	2.40	-74	
10:40	9.16	275.00	2.65	7.07	0.00	10.00	3.700	11.60	2.40	-73	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-10:45

Total Volume of Water purged: 2.65 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.02	Ferrous Iron (mg/L)	1.60
Spec. Cond.(mS/cm)	3.70	Manganese	0.00
Turbidity (NTU)	10.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	462.00
Temp.(°C)	11.60	Hydrogen Sulfide	1.00
TDS (g/L)	2.40	Alkalinity	170.00
ORP (mv)	-73.00	* NOTE - HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Choride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: very turbid to start

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

 Site Name: Hyde Park Facility

 Well ID: MW-11A

 Well Diameter: 2 Inches

 Samplers: DC Burkert, L. Bell

 Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

 Method: Geopump/Low Flow Date/Time: 5/11/10-100:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
8.18

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
10:00	8.18	250.00	0.00	7.91	8.74	170.00	2.540	11.60	1.70	-81	slug of orange at start
10:04	9.84	250.00	1.00	7.80	0.00	70.00	2.560	11.50	1.60	-94	clearing
10:09	10.08	200.00	2.00	7.77	0.00	37.00	2.550	11.70	1.60	-99	clear
10:14	10.21	150.00	2.75	7.73	0.00	30.00	2.550	11.70	1.60	-103	
10:19	10.12	150.00	3.50	7.71	0.00	18.00	2.540	11.80	1.60	-106	pump stalled, reset at 250
10:23	10.38	250.00	4.55	7.70	0.00	50.00	2.530	11.60	1.60	-110	
10:27	10.64	250.00	5.50	7.70	0.00	22.00	2.520	11.60	1.60	-110	
10:31	10.80	250.00	6.50	7.70	0.00	14.00	2.510	11.60	1.60	-111	
10:35	11.06	250.00	7.50	7.70	0.00	9.90	2.500	11.60	1.60	-111	
10:39	11.11	250.00	8.50	7.69	0.00	5.70	2.490	11.60	1.60	-113	
10:43	11.19	250.00	9.50	7.69	0.00	5.70	2.490	11.60	1.60	-113	stable

Sampling Data

 Method: Geopump/Low Flow

 Date/Time: 5/11/10-10:45

 Total Volume of Water purged: 5.5 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.69	Ferrous Iron (mg/L)	2.00
Spec. Cond.(mS/cm)	2.49	Manganese	0.00
Turbidity (NTU)	5.70	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	200.00
Temp.(°C)	11.60	Hydrogen Sulfide	0.10
TDS (g/L)	1.60	Alkalinty	68.00
ORP (mv)	-113.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-12A

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-11:40

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.24

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
11:40	4.24	200.00	0.00	7.96	5.37	55.00	1.670	11.30	1.10	-57	clear
11:45	4.30	200.00	1.00	7.75	0.00	31.00	1.670	11.40	1.10	-102	
11:50	4.30	200.00	2.00	7.67	0.00	19.00	1.670	11.40	1.10	-124	
11:55	4.30	200.00	3.00	7.63	0.00	9.00	1.660	11.30	1.10	-151	
12:00	4.30	200.00	4.00	7.62	0.00	6.40	1.660	11.40	1.10	-165	
12:05	4.30	200.00	5.00	7.60	0.00	5.90	1.660	11.40	1.10	-180	
12:10	4.30	200.00	6.00	7.61	0.00	5.40	1.660	11.40	1.10	-195	
12:15	4.30	200.00	7.00	7.60	0.00	4.70	1.650	11.40	1.10	-203	
12:20	4.30	200.00	8.00	7.60	0.00	3.20	1.650	11.40	1.10	-209	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-12:30

Total Volume of Water purged: 8 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.60	Ferrous Iron (mg/L)	1.00
Spec. Cond.(mS/cm)	1.65	Manganese	0.00
Turbidity (NTU)	2.80	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	600.00
Temp.(°C)	11.50	Hydrogen Sulfide	0.40
TDS (g/L)	1.10	Alkalinty	136.00
ORP (mv)	-213.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-12B

Well Diameter: 4 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-12:10

<i>WATER VOLUME CALCULATION</i>
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
2.6

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
12:10	2.60	250.00	0.00	7.38	1.90	0.95	0.800	11.40	0.50	-103	
12:15	2.55	250.00	0.25	7.27	1.10	0.97	0.800	11.40	0.50	-111	
12:20	2.56	250.00	0.50	7.22	0.90	0.96	0.800	11.40	0.50	-113	
12:25	2.57	250.00	0.75	7.21	0.89	0.95	0.800	11.50	0.50	-113	
12:30	2.56	250.00	1.00	7.20	0.88	0.96	0.800	11.50	0.50	-114	
12:35	2.56	250.00	1.25	7.20	0.88	0.95	0.800	11.50	0.50	-114	
12:40	2.56	250.00	1.50	7.20	0.87	0.96	0.800	11.50	0.50	-114	
12:45	2.55	250.00	1.75	7.20	0.87	0.95	0.800	11.50	0.50	-114	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-12:50

Total Volume of Water purged: 1.75 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.20	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	0.80	Manganese	0.00
Turbidity (NTU)	0.95	Sulfate	n/a
DO (mg/L)	0.87	Carbon Dioxide	422.00
Temp.(°C)	11.50	Hydrogen Sulfide	0.00
TDS (g/L)	0.50	Alkalinty	35.00
ORP (mv)	-114.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-13B

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/13/10-11:10

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
6.98

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
11:10	6.98	275.00	0.00	6.79	1.90	321.00	6.300	11.90	3.80	-136	
11:15	6.87	275.00	0.25	6.87	0.00	179.00	5.600	11.90	3.60	-140	
11:20	6.88	275.00	0.50	6.90	0.00	137.00	4.900	11.90	3.10	-138	
11:25	6.87	275.00	0.75	6.90	0.00	136.00	4.300	11.80	2.70	-136	
11:30	6.88	275.00	1.00	6.91	0.00	85.70	4.000	11.80	2.60	-127	
11:35	6.89	275.00	1.25	6.90	0.00	85.40	3.800	11.80	2.40	-126	
11:40	6.89	275.00	1.50	6.91	0.00	63.20	3.600	11.80	2.30	-125	
11:45	6.89	275.00	1.75	6.90	0.00	62.70	3.600	11.80	2.30	-124	
11:50	6.89	275.00	2.00	6.90	0.00	62.50	3.600	11.80	2.30	-124	
11:55	6.89	275.00	2.25	6.90	0.00	62.40	3.600	11.80	2.20	-123	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 3/10-12:00

Total Volume of Water purged: 2.25 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.90	Ferrous Iron (mg/L)	1.80
Spec. Cond.(mS/cm)	3.60	Manganese	0.00
Turbidity (NTU)	62.40	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	1200.00
Temp.(°C)	11.80	Hydrogen Sulfide	0.00
TDS (g/L)	2.20	Alkalinty	323.00
ORP (mv)	-123.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-14B

Well Diameter: 2 Inches

Samplers: DC Burkert, L.Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/13/10-09:55

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
5.2

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
9:55	5.20	200.00	0.00	6.28	4.76	7.88	2.210	11.90	1.40	-270	
10:00	5.92	200.00	1.00	7.22	0.00	5.90	1.830	12.10	1.20	-306	
10:05	5.96	200.00	2.00	7.53	0.00	4.31	1.790	12.10	1.10	-335	
10:10	5.98	200.00	3.00	7.61	0.00	3.72	1.760	12.10	1.10	-340	
10:15	5.98	200.00	4.00	7.62	0.00	3.13	1.740	12.10	1.10	-342	stable
10:20	5.98	200.00	5.00	7.64	0.00	3.21	1.730	12.10	1.10	-343	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/13/10-10:25

Total Volume of Water purged: 5 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.64	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.71	Manganese	0.00
Turbidity (NTU)	3.16	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	680.00
Temp.(°C)	12.20	Hydrogen Sulfide	5.00
TDS (g/L)	1.10	Alkalinity	510.00
ORP (mv)	344.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-15

Well Diameter: 2 Inches

Samplers: L. Bell, J. Schuetz

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/12/10-10:00

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.47

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
10:00	3.55		0.00	6.65	1.77	9.00	1.560	11.60	1.00	-303	
10:03	3.54		1.00	7.24	0.00	5.90	1.560	11.80	1.00	-327	
10:06	3.55		2.10	7.26	0.00	2.40	1.550	11.80	1.00	-335	
10:09	3.55		2.75	7.28	0.00	7.00	1.550	11.80	1.00	-337	
10:12	3.55			7.29	0.00	4.20	1.550	11.80	1.00	-339	
10:15	3.55		4.00	7.29	0.00	8.10	1.550	11.80	1.00	-341	
				7.30	0.00	10.01	1.550	11.80	1.00	-343	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/12/10-10:25

Total Volume of Water purged: 4 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.30	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	1.55	Manganese	0.00
Turbidity (NTU)	10.01	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	1600.00
Temp.(°C)	11.80	Hydrogen Sulfide	4.00
TDS (g/L)	1.00	Alkalinty	136.00
ORP (mv)	-343.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: *slight veg. oil odor in the well

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-16A

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-14:30

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.1	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
14:30	4.10	300.00	0.00	7.79	4.09	3.70	3.710	11.00	2.40	30	clear
14:35	7.25	150.00	1.50	7.59	0.00	2.30	3.580	11.00	2.30	36	adjust rate
14:40	8.24	150.00	2.25	7.55	0.00	3.40	3.560	11.20	2.30	34	
14:45	9.20	150.00	3.00	7.54	0.00	1.80	3.580	11.10	2.30	34	adjust:speed up
14:50	12.00	500.00	5.50	7.52	0.00	1.80	3.570	10.80	2.30	35	
14:55	14.40	500.00	8.00	7.52	0.00	1.80	3.570	10.80	2.30	40	
15:00	15.50	500.00	10.50	7.53	0.00	3.60	3.570	10.90	2.30	45	adjust:speed down
15:05	15.78	150.00	11.25	7.53	0.00	3.20	3.540	11.10	2.30	44	
15:10	15.98	150.00	12.00	7.53	0.00	3.60	3.560	11.10	2.30	44	
15:15	16.12	150.00	12.75	7.53	0.00	3.50	3.570	11.00	2.30	43	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-15:35

Total Volume of Water purged: 15.75 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.53	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	3.57	Manganese	0.00
Turbidity (NTU)	3.70	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	438.00
Temp.(°C)	11.00	Hydrogen Sulfide	0.00
TDS (g/L)	2.30	Alkalinity	170.00
ORP (mv)	37.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: This is page #1 for MW-16A

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-16A

Well Diameter: 2 Inches

Samplers: DC Burkert, L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-14:30

WATER VOLUME CALCULATION	
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot	
4.1	

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
15:20	16.38	150.00	13.50	7.53	0.00	3.50	3.570	10.90	2.30	40	
15:25	16.56	150.00	14.25	7.53	0.00	3.60	3.570	10.90	2.30	39	
15:30	16.68	150.00	15.00	7.54	0.00	3.50	3.570	11.00	2.30	35	
15:35	16.78	150.00	15.75	7.53	0.00	3.70	3.570	11.00	2.30	37	stable

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-15:35

Total Volume of Water purged: 15.75 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.53	Ferrous Iron (mg/L)	0.00
Spec. Cond.(mS/cm)	3.57	Manganese	0.00
Turbidity (NTU)	3.70	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	438.00
Temp.(°C)	11.00	Hydrogen Sulfide	0.00
TDS (g/L)	2.30	Alkalinity	170.00
ORP (mv)	37.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: This is page #2 for MW-16A

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-16B

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/11/10-14:40

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
3.5

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
14:40	3.50	255.00	0.00	7.06	0.40	3.70	1.600	11.70	1.00	-140	
14:45	3.45	255.00	0.25	7.04	0.00	3.60	1.600	11.80	1.10	-148	
14:50	3.44	255.00	0.50	7.03	0.00	3.10	1.600	11.90	1.10	-160	
15:00	3.44	255.00	0.75	7.03	0.00	2.80	1.600	11.90	1.10	-166	
15:05	3.43	255.00	1.00	7.03	0.00	2.30	1.600	11.90	1.00	-168	
15:10	3.43	255.00	1.25	7.03	0.00	2.30	1.600	11.90	1.00	-168	
15:15	3.43	255.00	1.50	7.03	0.00	2.30	1.600	11.90	1.00	-169	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/11/10-15:20

Total Volume of Water purged: 1.5 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.03	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.60	Manganese	0.00
Turbidity (NTU)	2.30	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	546.00
Temp.(°C)	11.90	Hydrogen Sulfide	1.00
TDS (g/L)	1.00	Alkalinity	170.00
ORP (mv)	-169.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane



LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-18A

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/12/10-07:40

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
5.1

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
7:40	5.10	275.00	0.00	6.29	0.40	18.00	1.300	11.00	0.90	-147	
7:45	5.11	275.00	0.40	6.54	0.00	18.00	2.200	11.20	1.50	-145	
7:50	5.10	275.00	0.80	6.55	0.00	17.00	2.100	11.30	1.60	-146	
7:55	5.11	275.00	1.15	6.54	0.00	11.00	2.000	11.30	2.00	-147	
8:00	5.11	275.00	1.50	6.54	0.00	0.00	2.000	11.30	2.00	-146	
8:05	5.11	275.00	1.85	6.55	0.00	0.00	2.000	11.30	2.00	-147	
8:10	5.10	275.00	2.15	6.56	0.00	0.00	2.000	11.30	2.00	-147	
8:15	5.10	275.00	2.45	6.55	0.00	0.00	2.000	11.30	2.00	-148	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/12/10-08:20

Total Volume of Water purged: 2.45 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	6.58	Ferrous Iron (mg/L)	1.20
Spec. Cond.(mS/cm)	2.00	Manganese	0.00
Turbidity (NTU)	0.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	560.00
Temp.(°C)	11.30	Hydrogen Sulfide	0.00
TDS (g/L)	2.00	Alkalinity	49.00
ORP (mv)	-148.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175
Chloride/Sulfate	2-40mL glass	None	Lab SOP
TOC	1-amber	H3PO4	5310C
Total Iron	1-500mL plastic	HNO3	SW6010B
BOD	1-500 mL plastic	none	SM5210B
COD	1-120 mL amber	H2SO4	EPA 410.4
Nitrate	1-40 mL glass	H2SO4	EPA 353.2
Nitrite	1-40 mL glass	none	EPA 354.1
Sulfide	1-500 mL plastic	NaOH/ZnAc	SM204500

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-18B

Well Diameter: 2 Inches

Samplers: DC Burkert

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/12/10-07:35

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
4.9

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	L		mg/L	NTU	mS/cm	°C	g/L	mv	
7:35	4.90	200.00	0.00	6.08	3.53	4.30	1.740	12.40	1.10	-18	
7:40	4.95	200.00	1.00	6.80	0.00	4.20	1.790	12.40	1.10	-63	
7:45	4.95	200.00	2.00	7.02	0.00	3.60	1.790	12.30	1.10	-79	
7:50	4.95	200.00	3.00	7.12	0.00	3.30	1.780	12.30	1.10	-82	
7:55	4.95	200.00	4.00	7.20	0.00	3.90	1.770	12.40	1.10	-85	
8:00	4.95	200.00	5.00	7.25	0.00	3.90	1.760	12.40	1.10	-84	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/12/10-08:10

Total Volume of Water purged: 5 L

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.26	Ferrous Iron (mg/L)	0.80
Spec. Cond.(mS/cm)	1.76	Manganese	0.00
Turbidity (NTU)	2.50	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	180.00
Temp.(°C)	12.50	Hydrogen Sulfide	0.00
TDS (g/L)	1.10	Alkalinty	136.00
ORP (mv)	-84.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park Facility

Well ID: MW-19B

Well Diameter: 2 Inches

Samplers: L. Bell

Monitored Natural Attenuation Sample Set (Y/N)? Yes

Purging Data

Method: Geopump/Low Flow Date/Time: 5/12/10-13:50

WATER VOLUME CALCULATION
= (Total Depth of Well - Depth To Water) x Casing Volume per Foot
5.35

Time	DTW	Pump Rate	Vol.	pH	DO	Turbidity	Spec. Cond.	Temp.	TDS	ORP	Comments
24 hr.	ft.	ml/min.	gal.		mg/L	NTU	mS/cm	°C	g/L	mv	
13:50	5.35	275.00	0.00	7.74	3.00	7.50	1.420	12.20	1.00	-168	
13:55	5.36	275.00	0.30	7.57	0.00	2.60	1.710	12.30	1.10	-214	
14:00	5.36	275.00	0.65	7.52	0.00	4.30	1.710	12.40	1.10	-243	
14:05	5.36	275.00	1.00	7.50	0.00	0.00	1.720	12.50	1.10	-244	
14:10	5.36	275.00	1.30	7.49	0.00	0.00	1.710	12.50	1.10	-245	
14:15	5.36	275.00	1.65	7.48	0.00	0.00	1.700	12.50	1.10	-245	
14:20	5.36	275.00	2.00	7.47	0.00	0.00	1.700	12.50	1.10	-244	

Sampling Data

Method: Geopump/Low Flow

Date/Time: 5/12/15:25

Total Volume of Water purged: 2 gal.

Field Parameters

HORRIBA		HACH TEST KITS	
pH	7.47	Ferrous Iron (mg/L)	0.20
Spec. Cond.(mS/cm)	1.70	Manganese	0.00
Turbidity (NTU)	0.00	Sulfate	n/a
DO (mg/L)	0.00	Carbon Dioxide	572.00
Temp.(°C)	12.50	Hydrogen Sulfide	2.00
TDS (g/L)	1.10	Alkalinty	170.00
ORP (mv)	-244.00	* NOTE * HACH test kits are only required for MNA analysis wells.	

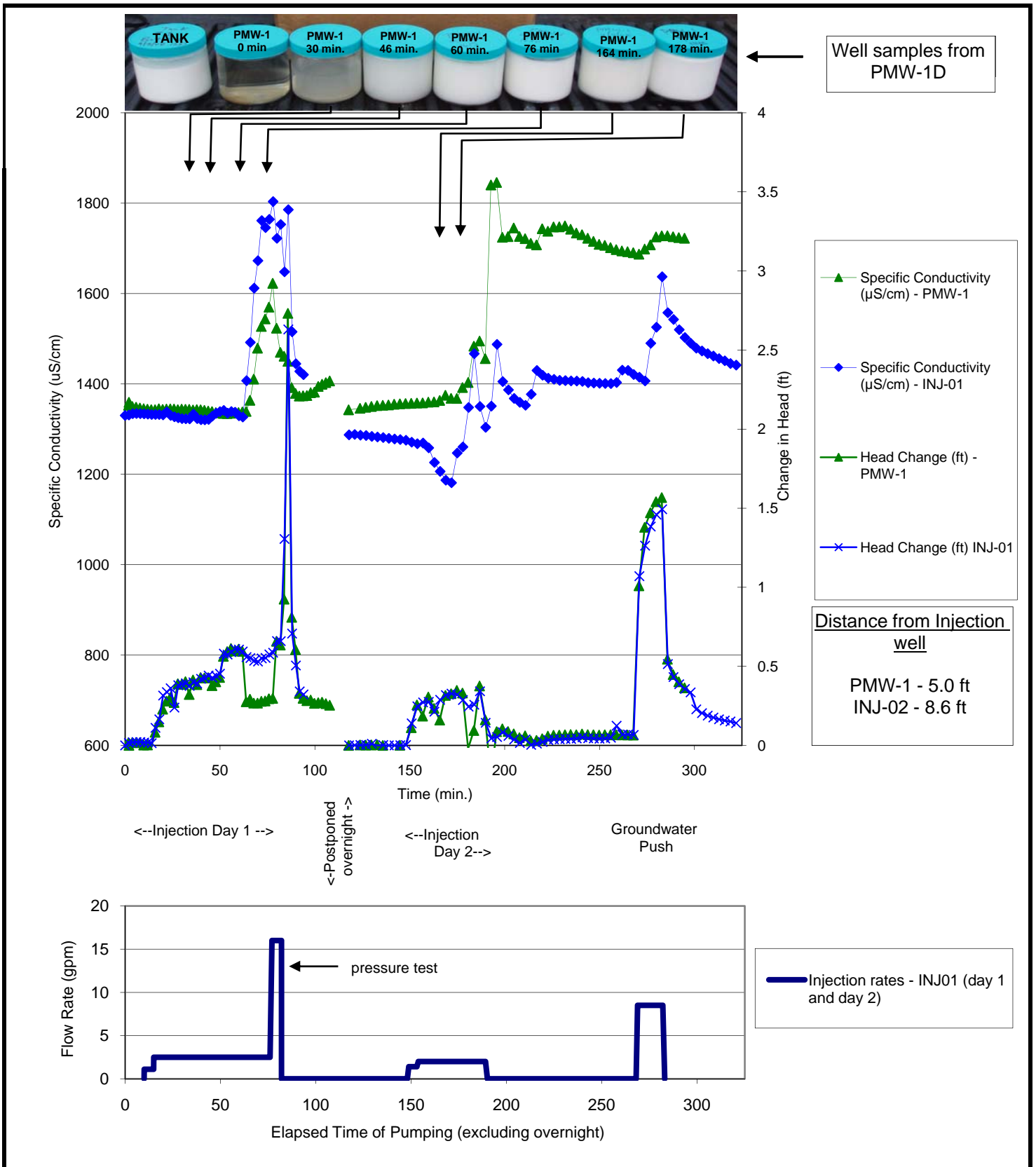
SAMPLE SET			
Parameter	Bottle	Pres.	Method
Select VOCs	3-40mL glass	HCl	EPA 8260
MEE	2-40mL glass	HCl	RSK-175

Comments: _____

VOCs - PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and Chloroethane

APPENDIX E

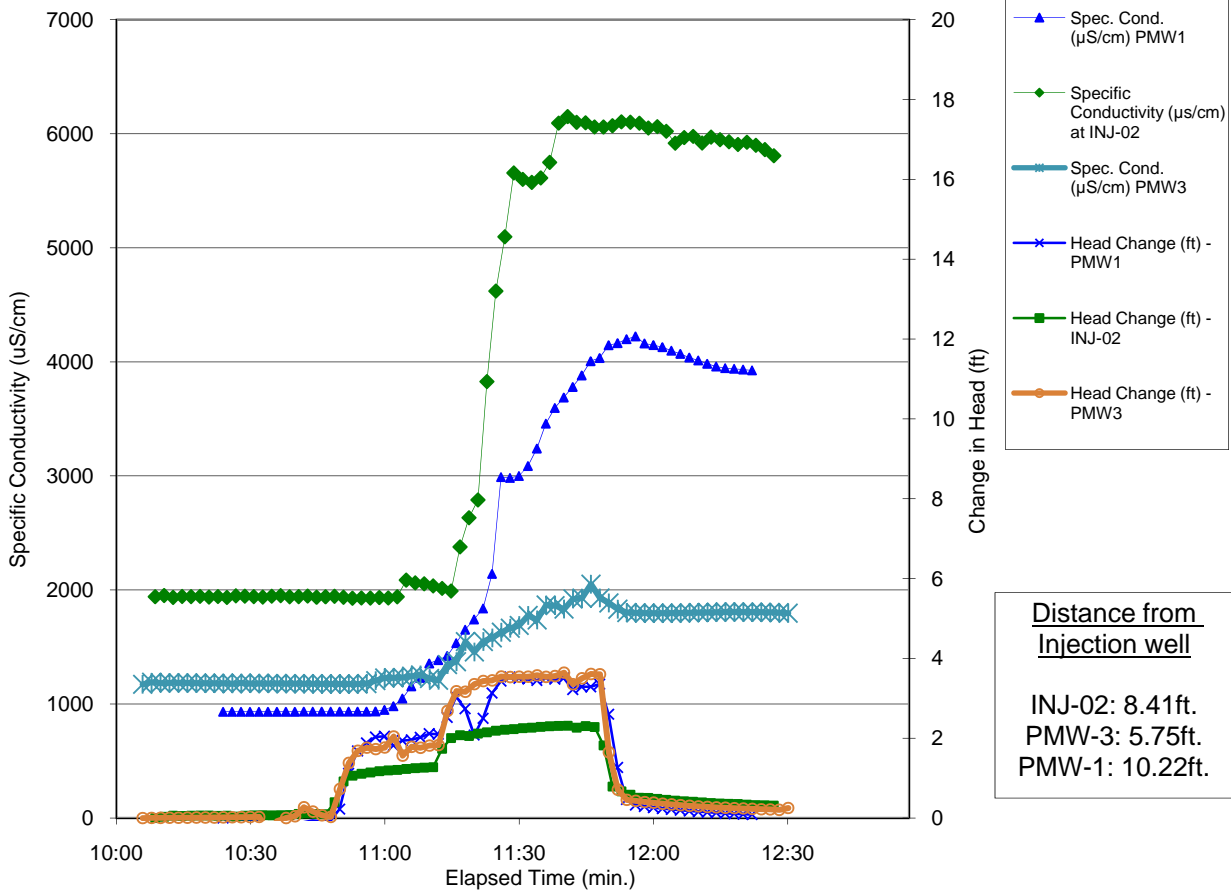
SUBSTRATE BREAKTHROUGH PLOTS



**INJ-02 INJECTION MONITORING - OBSERVATIONS AT PMW-1
OVERBURDEN BIOREMEDIATION PILOT TEST
HYDE PARK SITE
HYDE PARK, NIAGARA FALLS**

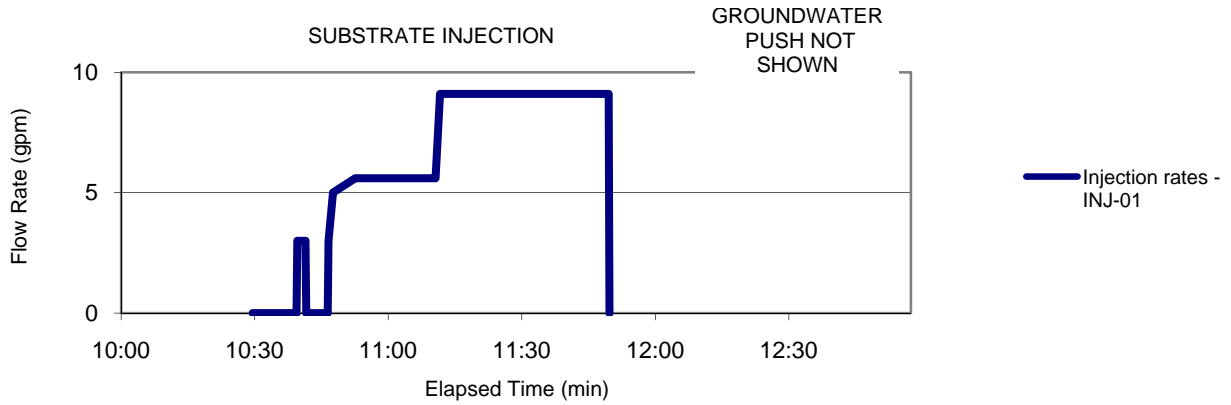
Project No.
444022

APPENDIX E



Distance from Injection well

INJ-02: 8.41ft.
 PMW-3: 5.75ft.
 PMW-1: 10.22ft.

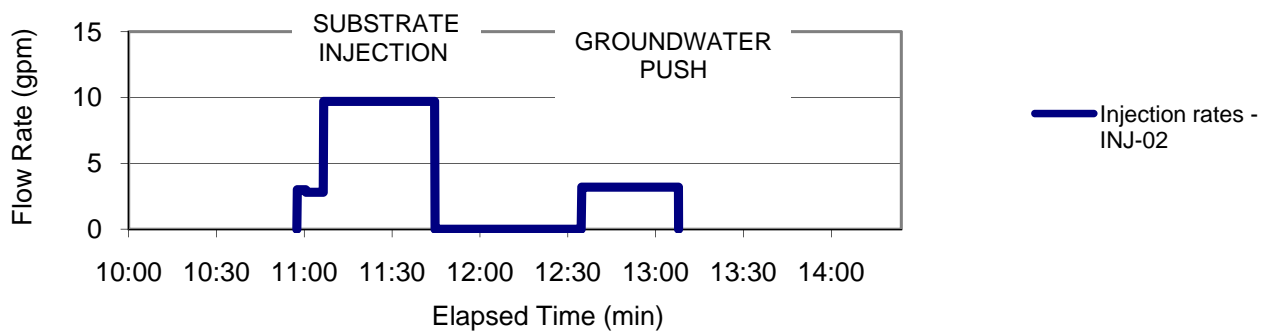
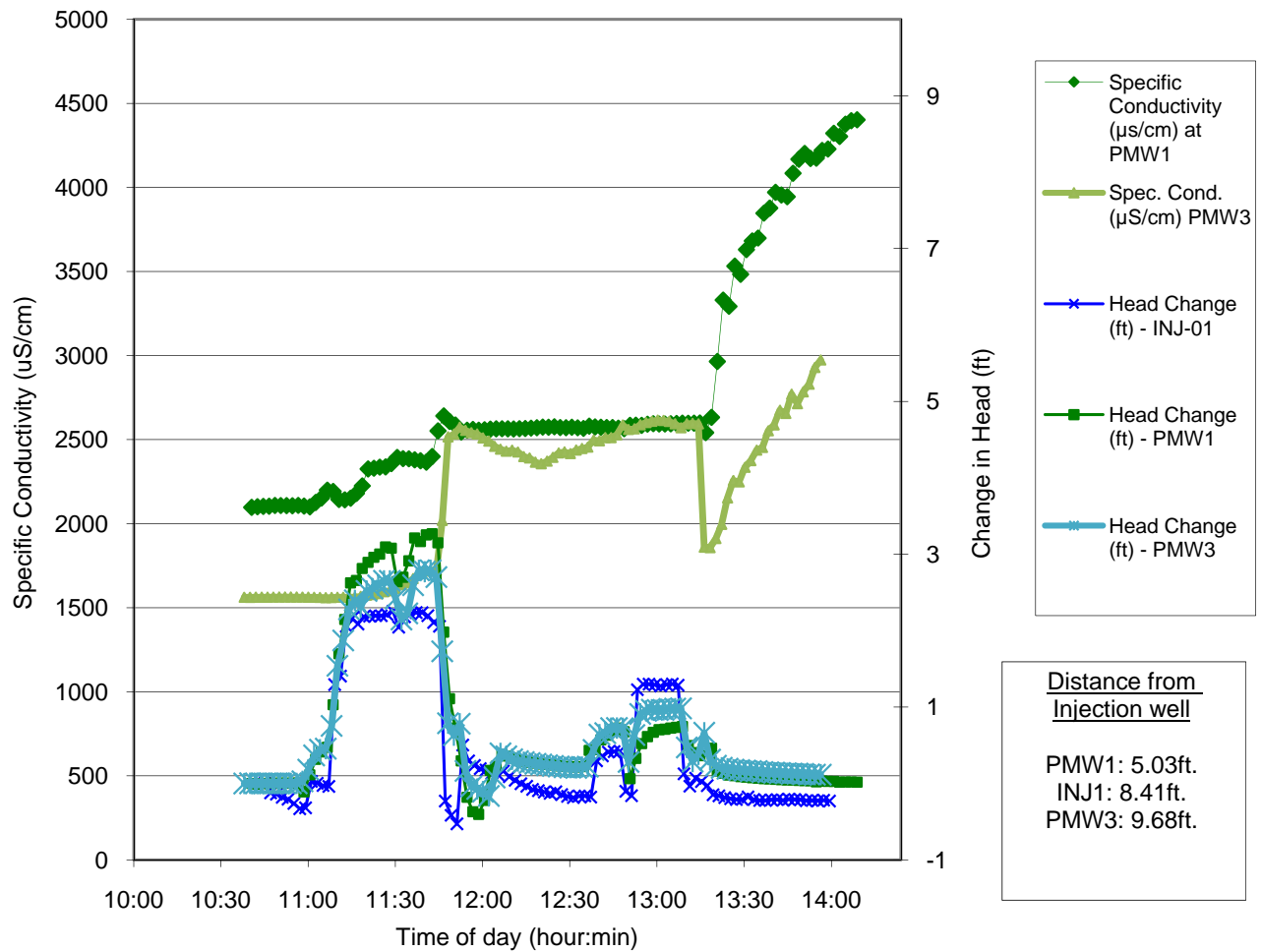


PARSONS

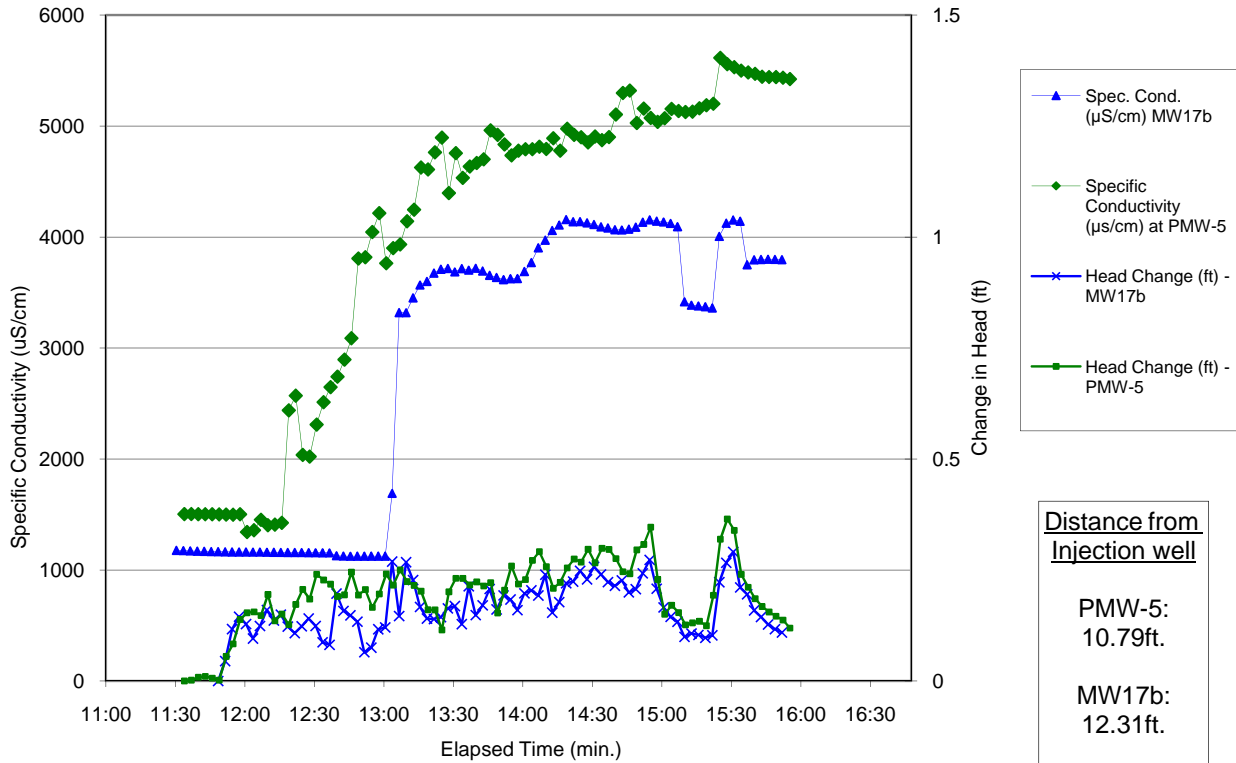
**INJ-01 - TEST - INJECTION MONITORING - OBSERVATIONS AT
 PMW3, PMW1 AND INJ-02
 OVERBURDEN BIOREMEDIATION PILOT TEST - FALL 2009
 HYDE PARK SITE
 HYDE PARK, NIAGARA FALLS**

Project No.
445335

APPENDIX E



PARSONS	INJ-02 - TEST - INJECTION MONITORING - OBSERVATIONS AT PMW1, INJ-01 AND PMW3 OVERBURDEN BIOREMEDIATION PILOT TEST - FALL 2009 HYDE PARK SITE HYDE PARK, NIAGARA FALLS	Project No. 445335
		APPENDIX E

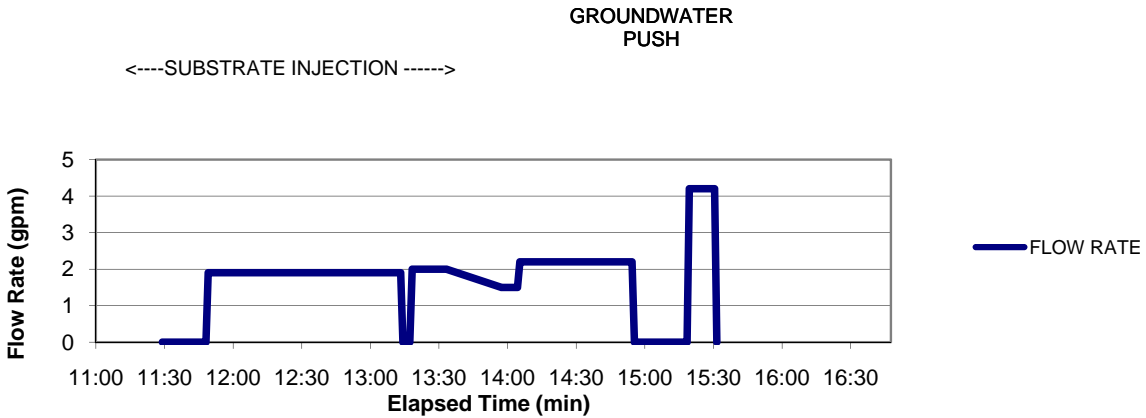


Distance from Injection well

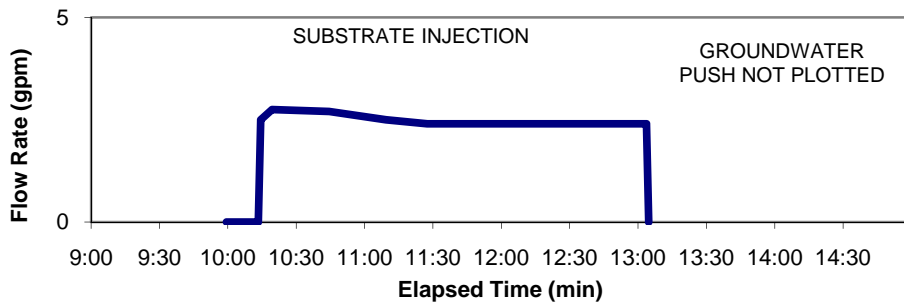
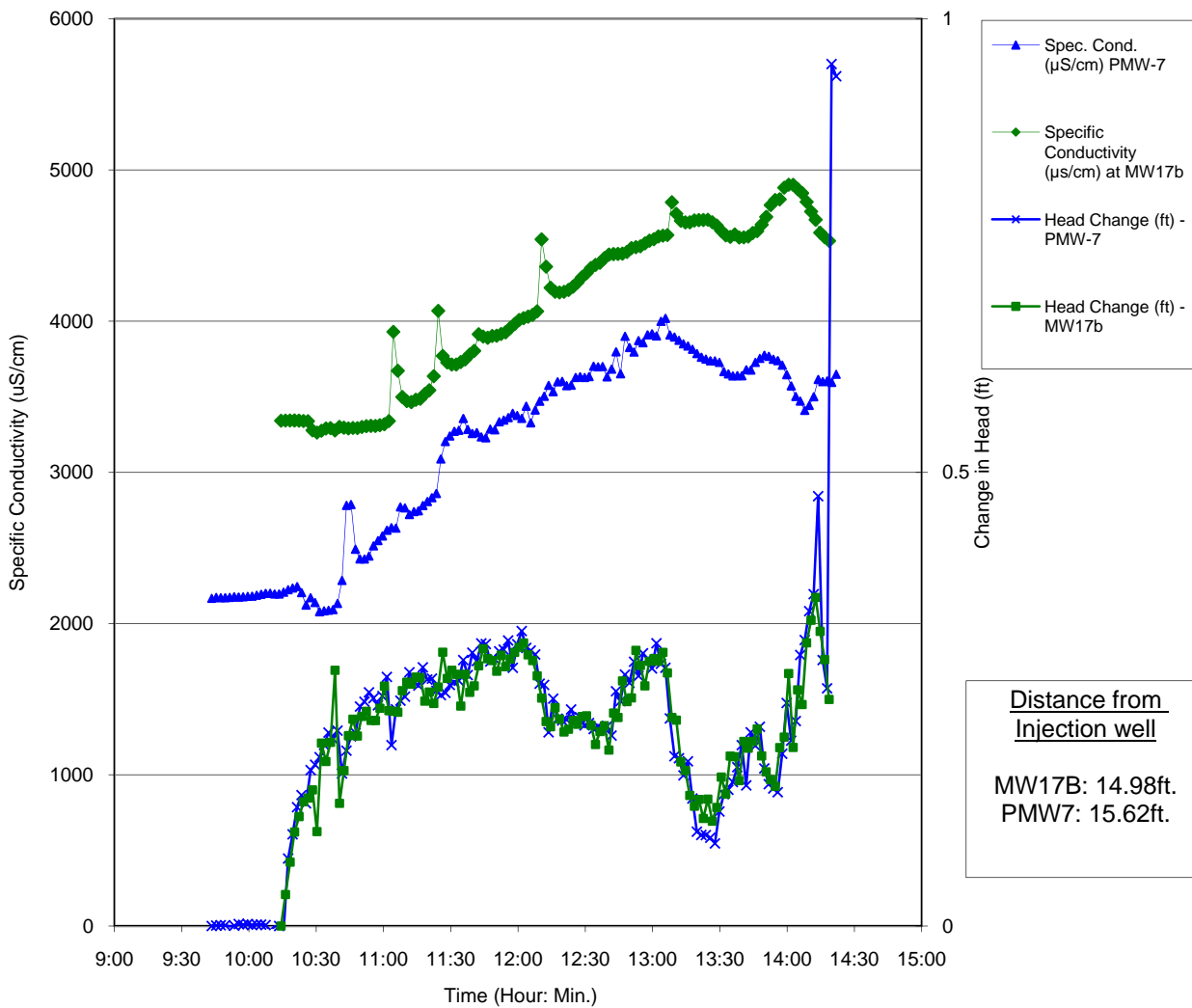
PMW-5:
10.79ft.

MW17b:
12.31ft.

Head change at MW-17B measurements were corrected due to adjustment of the transducer at approximately 84 to 90 minutes.



PARSONS	INJ-03 - TEST - INJECTION MONITORING - OBSERVATIONS AT PMW-5 AND MW17B BEDROCK BIOREMEDIATION PILOT TEST - FALL 2009 HYDE PARK SITE HYDE PARK, NIAGARA FALLS	Project No. 445335
		APPENDIX E



PARSONS

**INJ-04 - TEST - INJECTION MONITORING - OBSERVATIONS AT
PMW-7 AND MW17B
BEDROCK BIOREMEDIATION PILOT TEST - FALL 2009
HYDE PARK SITE
HYDE PARK, NIAGARA FALLS**

Project No.
445335

APPENDIX E

APPENDIX F

DATA USABILITY SUMMARY REPORTS

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

Prepared For:

Atlantic Richfield Company

4850 East 49th Street
MBC 3-147
Cuyahoga Heights, Ohio 44125

Prepared By:

PARSONS

40 La Riviere Drive, Suite 350
Buffalo, New York 14202
(716) 541-0730

SEPTEMBER 2008

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LIST OF ATTACHMENTS

Attachment A Validated Laboratory Data

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from August 11, 2008 through August 13, 2008. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI) and Microbial Insights (MI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 23 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, properly preserved, shipped under a COC record, and received at the laboratory within one to three days of sampling. All samples were received intact and in good condition at LLI and MI.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Hyde Park site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethane; the dissolved metals arsenic, manganese, and selenium; chloride; bromide; sulfate; total organic carbon (TOC); bacteria; and/or metabolic fatty acids.. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,

"N" - presumptive evidence at the value given, and
"R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. Certain reported results for the VOC samples were considered estimated due to noncompliant matrix spike/matrix spike duplicate recoveries and field duplicate precision. Therefore, the reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.2 Dissolved Arsenic, Manganese, and Selenium Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for dissolved arsenic, manganese, and selenium using the USEPA SW-846 6010B analytical method. The reported metals results did not require qualification resulting from data validation. Therefore, the reported metals analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; TOC using the SM20 5310C analytical method; dechlorinating bacteria and functional genes; and/or metabolic fatty acids. Holding times, laboratory blanks, matrix spike/matrix spike duplicate, laboratory duplicate precision, laboratory control samples, instrument calibrations, quantitation limits, sample result identification, and field duplicate precision were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation. Therefore, the reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 GROUNDWATER SAMPLES

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy, blank contamination, and field duplicate precision.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were compliant and within QC acceptance limits with the exception of the low MSD recovery for trichloroethene (25%R; QC limit 83-136%R) and the high MS/MSD recoveries for methane (183%R/150%R; QC limit 71-123%R) during the spiked analyses of sample INJ-02. Therefore, the positive methane result for the unspiked sample INJ-02 was considered estimated, possibly biased high, and qualified “J”.

Blank Contamination

The laboratory method blank PBLKKK associated with all samples contained methane at a concentration of 2 µg/L. Validation qualification of the methane sample results was not warranted since the samples were not affected by the contamination in this blank.

Field Duplicate Precision

All field duplicate precision results (RPDs) were compliant and considered acceptable with the exception of the precision for 1,1-dichloroethane (99%RPD), trichloroethene (94.3%RPD), and methane (71.2%RPD) associated with sample INJ-02 and its field duplicate sample INJ-200. Therefore, the positive results for these compounds were considered estimated and qualified “J” for INJ-02 and INJ-200.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

2.1.2 Dissolved Arsenic, Manganese, and Selenium

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike recoveries

- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All metals sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved arsenic, manganese, and selenium data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – GROUNDWATER

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
MW-3A	WATER	8/12/08	OK	OK		OK
MW-7A	WATER	8/13/08	OK	OK	OK	OK
MW-17A	WATER	8/12/08	OK	OK		OK
PMW-1	WATER	8/11/08	OK	OK		OK
PMW-2	WATER	8/11/08	OK	OK		OK
PMW-3	WATER	8/13/08	OK	OK	OK	OK
PMW-4	WATER	8/13/08	OK	OK		OK
PMW-8	WATER	8/12/08	OK	OK		OK
INJ-1	WATER	8/13/08	OK	OK		OK
INJ-02	WATER	8/12/08	OK	OK		OK
INJ-200	WATER	8/12/08	OK	OK		OK
TOTAL SAMPLES			11	11	2	11

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern Validated August 2008 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 1105320			Sample ID:	INJ-1	INJ-02	Dup of INJ-02	INJ-200	MW-17A	MW-3A	MW-7A
			Lab Sample Id:	5440894	5440895		5440899	5440888	5440886	5440887
			Source:	Lancaster	Lancaster		Lancaster	Lancaster	Lancaster	Lancaster
			SDG:	1105320	1105320		1105320	1105320	1105320	1105320
			Matrix:	WATER	WATER		WATER	WATER	WATER	WATER
			Sampled:	8/13/2008	8/12/2008		8/12/2008	8/12/2008	8/12/2008	8/13/2008
			Validated:	9/10/2008	9/10/2008		9/10/2008	9/10/2008	9/10/2008	9/10/2008
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	47	38	26	24	1 U	130		
75-35-4	1,1-Dichloroethene	ug/l	6.8	1.1 J	3 J	11	0.8 U	34		
75-15-0	Carbon Disulfide	ug/l	1 U	1 U	1 U	1 U	1 U	2.5 U		
75-09-2	Methylene Chloride	ug/l	2 U	2 U	2 U	2 U	2 U	5 U		
156-60-5	trans-1,2-Dichloroethene	ug/l	1.9 J	0.8 U	0.83 J	2.5 J	0.8 U	5.9 J		
75-34-3	1,1-Dichloroethane	ug/l	37	5.4 J	16 J	21	1 U	280		
156-59-2	cis-1,2-Dichloroethene	ug/l	470	66	76	190	0.89 J	1800		
71-55-6	1,1,1-Trichloroethane	ug/l	1.2 J	0.8 U	0.8 U	0.8 U	0.8 U	4.1 J		
79-01-6	Trichloroethene	ug/l	85	79 J	220 J	40	1 U	270		
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2 U		
	RSK-175 VOCs									
74-84-0	Ethane	ug/l	2.1 J	1.5 J	1.9 J	1 U	1 U	1 U		
74-85-1	Ethene	ug/l	2.5 J	2.4 J	2.2 J	1.5 J	1 U	7.2		
74-82-8	Methane	ug/l	140	120 J	57 J	120	25	21		
	DISSOLVED METALS									
7440-38-2	Arsenic	mg/l						0.0102 U		
7439-96-5	Manganese	mg/l						0.0502		
7782-49-2	Selenium	mg/l						0.0107 U		
	OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	3.7	3.8	3.7	2.4	2.6	3.2		
16887-00-6	Chloride	mg/l	85.1	124	109	1250	17.6	22.3		
14808-79-8	Sulfate	mg/l	280	298	298	168	318	282		
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U		

Analytical Summary Table for Chemicals of Concern Validated August 2008 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 1105320		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-1 5440889 Lancaster 1105320 WATER 8/11/2008 9/10/2008	PMW-2 5440890 Lancaster 1105320 WATER 8/11/2008 9/10/2008	PMW-3 5440891 Lancaster 1105320 WATER 8/13/2008 9/10/2008	PMW-4 5440892 Lancaster 1105320 WATER 8/13/2008 9/10/2008	PMW-8 5440893 Lancaster 1105320 WATER 8/12/2008 9/10/2008
CAS NO.	COMPOUND	UNITS:					
	VOLATILES						
75-01-4	Vinyl chloride	ug/l	57	38	39	1 U	83
75-35-4	1,1-Dichloroethene	ug/l	13	39	2.5 J	0.8 U	0.8 U
75-15-0	Carbon Disulfide	ug/l	1 U	5 U	1 U	1 U	1 U
75-09-2	Methylene Chloride	ug/l	2 U	10 U	2 U	2 U	2 U
156-60-5	trans-1,2-Dichloroethene	ug/l	1.4 J	11 J	4 J	0.8 U	0.99 J
75-34-3	1,1-Dichloroethane	ug/l	74	180	10	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	330	2700	460	2.7 J	78
71-55-6	1,1,1-Trichloroethane	ug/l	1.8 J	5.7 J	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	280	3600	270	8.4	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	4 U	0.8 U	0.8 U	0.8 U
	RSK-175 VOCs						
74-84-0	Ethane	ug/l	3.7 J	2.4 J	2.9 J	4 J	1 U
74-85-1	Ethene	ug/l	4.3 J	5.2	3 J	1 U	4 J
74-82-8	Methane	ug/l	98	150	120	12	140
	DISSOLVED METALS						
7440-38-2	Arsenic	mg/l			0.0102 U		
7439-96-5	Manganese	mg/l			0.0955		
7782-49-2	Selenium	mg/l			0.0107 U		
	OTHER						
7440-44-0	Carbon, Total Organic (TOC)	mg/l	4.2	4.4	4.4	5	4.3
16887-00-6	Chloride	mg/l	115	88.6	106	14.4	110
14808-79-8	Sulfate	mg/l	291	288	289	222	331
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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LIST OF ATTACHMENTS

Attachment A Validated Laboratory Data

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from October 6, 2008 through October 8, 2008. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI). LLI is approved to conduct project analyses through the New York Department of Health (NYDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 28 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, shipped under a COC record, and received at the laboratory within one to three days of sampling. All samples were received intact and in good condition at LLI.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Hyde Park site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethane; the dissolved metals arsenic, manganese, and selenium; chloride; bromide; sulfate; and total organic carbon (TOC). Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,

"N" - presumptive evidence at the value given, and

"R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. Certain reported results for the VOC samples were considered estimated due to noncompliant sample holding times and instrument calibrations. Therefore, the reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.2 Dissolved Arsenic, Manganese, and Selenium Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for dissolved arsenic, manganese, and selenium using the USEPA SW-846 6010B analytical method. The reported metals results did not require qualification resulting from data validation. Therefore, the reported metals analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; and TOC using the SM20 5310C analytical method; dechlorinating bacteria and functional genes; and/or metabolic fatty acids. Holding times, laboratory blanks, matrix spike/matrix spike duplicate, laboratory duplicate precision, laboratory control samples, instrument calibrations, quantitation limits, sample result identification, and field duplicate precision were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation with the exception of the detected chloride results. These chloride results were considered estimated, possibly biased high, and qualified "J" since the associated matrix spike recovery (127%R) exceeded the QC acceptance range (QC limit 90-110%R). Therefore, the reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 GROUNDWATER SAMPLES

Data review has been completed for data packages generated by LLI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were shipped under a COC record and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of holding times, MS/MSD precision and accuracy, and initial calibrations.

Holding Times

All analytical holding times were compliant for the volatile and methane, ethane, and ethane samples with the exception of volatile sample MW-7B. This sample was received by the laboratory unpreserved (i.e., pH was greater than 2) and exceeded the 7-day holding time requirement for unpreserved samples by 3 days. Therefore, volatile sample results were considered estimated, possibly biased low, with positive results qualified “J” and nondetected results qualified “UJ” for this sample.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were compliant and within QC acceptance limits with the exception of the high MS recovery for vinyl chloride (151%R; QC limit 68-147%R) and the high MSD recovery for methane (169%R; QC limit 35-157%R) during the spiked analyses of sample MW-7B. Validation qualification of the unspiked sample MW-7B was not required since only one MS or MSD spiked accuracy result was an outlier.

Initial Calibrations

All initial calibration compounds were compliant with a percent relative standard deviation (%RSD) less than 30% and a mean relative response factor (RRF) greater than 0.05 with the exception of methane (39%RSD) in the initial calibration associated with all samples. Therefore, the methane results which were all detected concentrations, were considered estimated and qualified “J” for all samples.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

2.1.2 Dissolved Arsenic, Manganese, and Selenium

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries

- Matrix spike recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All metals sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved arsenic, manganese, and selenium data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – GROUNDWATER

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
MW-3A	WATER	10/6/08	OK	OK		OK
MW-7A	WATER	10/8/08	OK	OK	OK	OK
MW-7B	WATER	10/7/08	OK	OK	OK	OK
MW-17A	WATER	10/7/08	OK	OK		OK
MW-17B	WATER	10/8/08	OK	OK	OK	OK
MW-70B	WATER	10/7/08	OK	OK	OK	OK
PMW-1	WATER	10/7/08	OK	OK		OK
PMW-2	WATER	10/7/08	OK	OK		OK
PMW-3	WATER	10/8/08	OK	OK	OK	OK
PMW-4	WATER	10/7/08	OK	OK		OK
PMW-8	WATER	10/6/08	OK	OK	OK	OK
INJ-1	WATER	10/8/08	OK	OK	OK	OK
INJ-2	WATER	10/7/08	OK	OK		OK
TOTAL SAMPLES			13	13	7	13

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern Validated October 2008 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 1114197			Sample ID:	INJ-1	INJ-2	MW-3A	MW-7A	MW-7B	Dup of MW-7B	MW-70B	MW-17A
			Lab Sample Id:	5493657	5493658	5493664	5493659	5493660		5493667	5493665
			Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster		Lancaster	Lancaster
			SDG:	1114197	1114197	1114197	1114197	1114197		1114197	1114197
			Matrix:	WATER	WATER	WATER	WATER	WATER		WATER	WATER
			Sampled:	10/8/2008	10/7/2008	10/6/2008	10/8/2008	10/7/2008		10/7/2008	10/7/2008
			Validated:	11/17/2008	11/17/2008	11/17/2008	11/17/2008	11/17/2008		11/17/2008	11/17/2008
CAS NO.	COMPOUND	UNITS:									
VOLATILES											
75-01-4	Vinyl chloride	ug/l	58	47	1 U	210	29 J	35	23		
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	
75-35-4	1,1-Dichloroethene	ug/l	3.4 J	4 J	0.8 U	25	0.8 UJ	0.8 U	13		
156-60-5	trans-1,2-Dichloroethene	ug/l	1.5 J	0.8 U	0.8 U	3.5 J	0.8 UJ	0.8 U	3.5 J		
75-34-3	1,1-Dichloroethane	ug/l	19	22	1 U	250	1 UJ	1 U	23		
156-59-2	cis-1,2-Dichloroethene	ug/l	340	170	11	1800	19 J	20	200		
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 UJ	0.8 U	0.8 U	0.8 U	
79-01-6	Trichloroethene	ug/l	21	87	1.9 J	58	1 UJ	1 U	43		
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 UJ	0.8 U	0.8 U	0.8 U	
74-84-0	Ethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
74-85-1	Ethene	ug/l	3.9 J	3.4 J	1 U	12	3.1 J	3.3 J	1.3 J		
74-82-8	Methane	ug/l	150 J	200 J	19 J	21 J	220 J	200 J	120 J		
METALS, DISSOLVED											
7440-38-2	Arsenic	mg/l	0.0102 U			0.0102 U	0.0102 U	0.0102 U			
7439-96-5	Manganese	mg/l	0.124			0.261	0.0951	0.088			
7782-49-2	Selenium	mg/l	0.0107 U			0.0107 U	0.0107 U	0.0107 U			
OTHER											
7440-44-0	Carbon, Total Organic (TOC)	mg/l	37.8	36.6	2.3	143	5	5.1	2.2		
16887-00-6	Chloride	mg/l	115 J	138 J	19.4 J	21.3 J	164 J	167 J	1270 J		
14808-79-8	Sulfate	mg/l	227	230	347	60.4	271	270	165		
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U		

Analytical Summary Table for Chemicals of Concern Validated October 2008 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 1114197		Sample ID: Lab Sample Id	MW-17B 5493666	PMW-1 5493652	PMW-2 5493653	PMW-3 5493654	PMW-4 5493655	PMW-8 5493656
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1114197	1114197	1114197	1114197	1114197	1114197
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	10/8/2008	10/7/2008	10/7/2008	10/8/2008	10/7/2008	10/6/2008
		Validated:	11/17/2008	11/17/2008	11/17/2008	11/17/2008	11/17/2008	11/17/2008
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
75-01-4	Vinyl chloride	ug/l	120	53	53	65	14	85
75-00-3	Chloroethane	ug/l	1 U	1 U	4 U	2 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	4.4 J	6.2	67	10	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	5.9	1.2 J	15 J	19	0.8 U	0.92 J
75-34-3	1,1-Dichloroethane	ug/l	22	39	260	19	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	600	350	3500	3600	20	92
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	14 J	1.6 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	3.3 J	47	5600	680	2.3 J	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	3.2 U	1.6 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U	2 J	1.6 J	4.1 J	4.3 J	1 U
74-85-1	Ethene	ug/l	6.6	4.7 J	6.5	14	1.9 J	5.4
74-82-8	Methane	ug/l	170 J	130 J	130 J	100 J	180 J	170 J
	METALS, DISSOLVED							
7440-38-2	Arsenic	mg/l	0.0102 U			0.0102 U		0.0102 U
7439-96-5	Manganese	mg/l	0.102			0.337		0.0603
7782-49-2	Selenium	mg/l	0.0107 U			0.0107 U		0.0107 U
	OTHER							
7440-44-0	Carbon, Total Organic (TOC)	mg/l	55.7	75.3	28.5	91.2	3.7	11.9
16887-00-6	Chloride	mg/l	561 J	97.7 J	91.8 J	92.3 J	101 J	116 J
14808-79-8	Sulfate	mg/l	169	160	275	175	256	307
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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FEBRUARY 2009

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Attachment A Validated Laboratory Data

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from December 8, 2008 through December 10, 2008. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI) and Microbial Insights (MI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 50 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, shipped under a COC record, and received at the laboratory within one to two days of sampling. All samples were received intact and in good condition at LLI and MI.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Hyde Park site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethene; the dissolved metals arsenic, manganese, and selenium; chloride; bromide; sulfate; total organic carbon (TOC); and metabolic acids. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,

"N" - presumptive evidence at the value given, and

"R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. The reported results for the VOC and methane, ethane, and ethene samples did not require qualification from data validation. Therefore, the reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.2 Dissolved Arsenic, Manganese, and Selenium Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for dissolved arsenic, manganese, and selenium using the USEPA SW-846 6010B analytical method. The reported metals results did not require qualification resulting from data validation. Therefore, the reported metals analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; TOC using the SM20 5310C analytical method; and/or metabolic fatty acids. Holding times, laboratory blanks, matrix spike/matrix spike duplicate, laboratory duplicate precision, laboratory control samples, instrument calibrations, quantitation limits, sample result identification, and field duplicate precision were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation with the exception of the nondetected butyric acid results. These results were considered estimated and qualified "UJ" due to laboratory duplicate precision. Therefore, the reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 GROUNDWATER SAMPLES

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were shipped under a COC record and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were compliant and within QC acceptance limits with the exception of the low MS recovery for cis-1,2-dichloroethene (-53%R; QC limit 83-126%R) during the spiked analyses of sample PMW-3. Validation qualification of the unspiked sample PMW-3 was not required since MSD accuracy results were compliant.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

2.1.2 Dissolved Arsenic, Manganese, and Selenium

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All metals sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved arsenic, manganese, and selenium data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – GROUNDWATER

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
MW-3A	WATER	12/8/08	OK	OK		OK
MW-7A	WATER	12/9/08	OK	OK	OK	OK
MW-7B	WATER	12/9/08	OK	OK	OK	OK
MW-17A	WATER	12/10/08	OK	OK		OK
MW-17B	WATER	12/10/08	OK	OK	OK	OK
PMW-1	WATER	12/9/08	OK	OK		OK
PMW-2	WATER	12/10/08	OK	OK		OK
PMW-3	WATER	12/9/08	OK	OK	OK	OK
PMW-300	WATER	12/9/08	OK	OK	OK	OK
PMW-4	WATER	12/10/08	OK	OK		OK
PMW-8	WATER	12/9/08	OK	OK	OK	OK
INJ-01	WATER	12/9/08	OK	OK		OK
INJ-02	WATER	12/9/08	OK	OK		OK
TOTAL SAMPLES			13	13	6	13

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern Validated December 2008 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 1123961										Dup of PMW-3	PMW-8
CAS NO.	COMPOUND	Sample ID: Lab Sample Id	INJ-01 5553696	INJ-02 5553694	MW-3A 5553690	MW-7A 5553692	MW-7B 5553693	PMW-1 5553695	PMW-3 5553697	PMW-300 5553701	PMW-8 5553691
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1123961	1123961	1123961	1123961	1123961	1123961	1123961	1123961	1123961
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	12/9/2008	12/9/2008	12/8/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/8/2008	12/8/2008
		Validated:	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009
CAS NO.	COMPOUND	UNITS:									
	VOLATILES										
75-01-4	Vinyl chloride	ug/l	110	44	1 U	180	33	72	66	68	83
75-00-3	Chloroethane	ug/l	2 U	1 U	1 U	2 U	1 U	1 U	2 U	2 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	6.2 J	1.9 J	0.8 U	9.6 J	0.8 U	2.3 J	2.9 J	2.7 J	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	3.4 J	0.81 J	0.8 U	1.7 J	0.8 U	1.2 J	4.3 J	4.4 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	45	9.4	1 U	150	1 U	26	8.6 J	8.6 J	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	1000	170	0.8 U	1100	21	320	1100	990	77
71-55-6	1,1,1-Trichloroethane	ug/l	1.6 U	0.8 U	0.8 U	1.6 U	0.8 U	0.8 U	1.6 U	1.6 U	0.8 U
79-01-6	Trichloroethene	ug/l	5.6 J	14	1.4 J	4.3 J	1 U	3.7 J	11	11	1 U
127-18-4	Tetrachloroethene	ug/l	1.6 U	0.8 U	0.8 U	1.6 U	0.8 U	0.8 U	1.6 U	1.6 U	0.8 U
74-84-0	Ethane	ug/l	1 U	1 U	1 U	1 U	1 U	8.7	1 J	1.1 J	1 U
74-85-1	Ethene	ug/l	11	4.3 J	1 U	27	4.1 J	16	9.7	10	12
74-82-8	Methane	ug/l	190	160	7.7 J	24	250	160	160	170	180
	METALS, DISSOLVED										
7440-38-2	Arsenic	mg/l				0.01 U	0.01 U		0.01 U	0.01 U	0.01 U
7439-96-5	Manganese	mg/l				0.0539	0.11		0.108	0.112	0.0666
7782-49-2	Selenium	mg/l				0.0107 U	0.0107 U		0.0107 U	0.0107 U	0.0107 U
	OTHER										
7440-44-0	Carbon, Total Organic (TOC)	mg/l	29	18.5	4.9	25.1	9	12	18.7	18.6	6.2
16887-00-6	Chloride	mg/l	59.8	74.5	23.3	24.1	153	78.9	92.6	92.4	119
14808-79-8	Sulfate	mg/l	182	245	444	295	384	245	213	226	309
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

Analytical Summary Table for Chemicals of Concern Validated December 2008 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 1124261		Sample ID: Lab Sample Id:	MW-17A 5555247	MW-17B 5555248	PMW-2 5555249	PMW-4 5555250
		Source:	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1124261	1124261	1124261	1124261
		Matrix:	WATER	WATER	WATER	WATER
		Sampled:	12/10/2008	12/10/2008	12/10/2008	12/10/2008
		Validated:	2/2/2009	2/2/2009	2/2/2009	2/2/2009
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
75-01-4	Vinyl chloride	ug/l	27	170	63 J	11
75-00-3	Chloroethane	ug/l	1 U	1 U	20 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	12	2.9 J	95 J	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	2.2 J	3.1 J	18 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	25	28	430	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	210	260	5800	15
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	21 J	0.8 U
79-01-6	Trichloroethene	ug/l	39	2.6 J	7400	9.8
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	16 U	0.8 U
74-84-0	Ethane	ug/l	1 U	1 U	1 U	1.7 J
74-85-1	Ethene	ug/l	1.1 J	33	4.8 J	1 U
74-82-8	Methane	ug/l	65	120	47	87
	METALS, DISSOLVED					
7440-38-2	Arsenic	mg/l		0.01 U		
7439-96-5	Manganese	mg/l		0.109		
7782-49-2	Selenium	mg/l		0.0107 U		
	OTHER					
7440-44-0	Carbon, Total Organic (TOC)	mg/l	2.2	3	4	2.8
16887-00-6	Chloride	mg/l	1070	802	45.5	94.8
14808-79-8	Sulfate	mg/l	161	180	295	236
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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MARCH 2009

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LIST OF ATTACHMENTS

Attachment A Validated Laboratory Data

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from January 26, 2009 through January 27, 2009. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- July 2005 NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs) for organic data review.

The analytical laboratory for this project was Lancaster Laboratories, Inc. (LLI). LLI is certified to conduct project analyses in the State of New York through the National Environmental Laboratory Accreditation Program (NELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 31 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, properly preserved, shipped under a COC record, and received at the laboratory within one to two days of sampling. All samples were received intact and in good condition at LLI with the exception of one volatile vial which was received broken for samples MW-3A and MW-17B. Enough volume remained in the alternate vials to conduct volatile analysis for these samples.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Hyde Park site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethene. A summary of issues concerning these laboratory analyses are presented in Subsection 1.3.1. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,

"N" - presumptive evidence at the value given, and

"R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for certain VOCs using the USEPA SW-846 8260B analytical method; and methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. The reported results for the VOC and methane, ethane, and ethene samples did not require qualification from data validation. Therefore, the reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 GROUNDWATER SAMPLES

Data review has been completed for data packages generated by LLI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were shipped under a COC record and received intact by the analytical laboratory with the exception of one volatile vial which was received broken for samples MW-3A and MW-17B. Enough volume remained in the alternate vials to conduct volatile analysis for these samples. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were compliant and within QC acceptance limits with the exception of the high MS recovery for cis-1,2-dichloroethene (152%R; QC limit 83-126%R); the low MSD recovery for methane (17%R; QC limit 35-157%R); and the precision results for ethane (22%RPD; QC limit 0-20%RPD) and ethene (22%RPD; QC limit 0-20%RPD) during the spiked analyses of sample INJ-02. Validation qualification of the parent sample INJ-02 was not required.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – GROUNDWATER

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>
MW-3A	WATER	1/26/09	OK	OK
MW-7A	WATER	1/27/09	OK	OK
MW-7B	WATER	1/27/09	OK	OK
MW-17A	WATER	1/26/09	OK	OK
MW-17B	WATER	1/26/09	OK	OK
PMW-1	WATER	1/27/09	OK	OK
PMW-2	WATER	1/27/09	OK	OK
PMW-3	WATER	1/27/09	OK	OK
PMW-4	WATER	1/27/09	OK	OK
PMW-8	WATER	1/27/09	OK	OK
INJ-01	WATER	1/27/09	OK	OK
INJ-02	WATER	1/27/09	OK	OK
INJ-20	WATER	1/27/09	OK	OK
TOTAL SAMPLES			13	13

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

			Dup of INJ-02							
Analytical Summary Table for Chemicals of Concern Validated January 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility			Sample ID: Lab Sample Id:	INJ-01 5586953	INJ-02 5586954	INJ-20 5586957	MW- 3A 5586943	MW- 7A 5586944	MW- 7B 5586945	MW-17A 5586946
			Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
			SDG:	1129861	1129861	1129861	1129861	1129861	1129861	1129861
			Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
			Sampled:	1/27/2009	1/27/2009	1/27/2009	1/26/2009	1/27/2009	1/27/2009	1/26/2009
			Validated:	3/16/2009	3/16/2009	3/16/2009	3/16/2009	3/16/2009	3/16/2009	3/16/2009
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	200	64	61	1 U	390	29	29	
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
75-35-4	1,1-Dichloroethene	ug/l	5.4	1.2 J	1.3 J	0.8 U	7.6	0.8 U	11	
156-60-5	trans-1,2-Dichloroethene	ug/l	3.8 J	0.8 U	0.8 U	0.8 U	2.4 J	0.8 U	2.1 J	
75-34-3	1,1-Dichloroethane	ug/l	50	8.7	8.9	1 U	230	1 U	23	
156-59-2	cis-1,2-Dichloroethene	ug/l	830	150	160	1 J	840	13	210	
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
79-01-6	Trichloroethene	ug/l	8.7	3.7 J	4 J	1 U	3.2 J	1 U	32	
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
74-84-0	Ethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
74-85-1	Ethene	ug/l	21	6.6	6.4	1 U	51	3.3 J	1.4 J	
74-82-8	Methane	ug/l	320	210	210	7.3 J	110	220	88	

Analytical Summary Table for Chemicals of Concern Validated January 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample Id	MW-17B 5586947	PMW-1 5586948	PMW-2 5586949	PMW-3 5586950	PMW-4 5586951	PMW-8 5586952
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1129861	1129861	1129861	1129861	1129861	1129861
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	1/26/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009
		Validated:	3/16/2009	3/16/2009	3/16/2009	3/16/2009	3/16/2009	3/16/2009
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
75-01-4	Vinyl chloride	ug/l	210	67	150	420	26	80
75-00-3	Chloroethane	ug/l	1 U	1.6 J	5 U	5 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	3.1 J	1.7 J	47	9.3 J	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	4.2 J	0.85 J	14 J	20 J	0.8 U	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	24	38	200	47	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	280	240	3200	4300	34	51
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	7.8 J	4 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	2.1 J	6.9	2500	34	1.7 J	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	4 U	4 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U	4.9 J	1 U	1 U	1 U	1 U
74-85-1	Ethene	ug/l	61	27	15	44	1.2 J	19
74-82-8	Methane	ug/l	130	980	140	92	130	130

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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APRIL 2009

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SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from March 16, 2009 through March 18, 2009. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI) and Microbial Insights (MI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 32 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, properly preserved, shipped under a COC record, and received at the laboratory within one to three days of sampling. All samples were received intact and in good condition at LLI and MI.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Hyde Park site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethene; the dissolved metals arsenic, manganese, and selenium; chloride; bromide; sulfate; total organic carbon (TOC); metabolic acids; and dechlorinating bacteria and functional genes. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

"U" - not detected at the value given,

"UJ" - estimated and not detected at the value given,

"J" - estimated at the value given,

"N" - presumptive evidence at the value given, and

"R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. The reported results for the VOC and methane, ethane, and ethene samples did not require qualification from data validation. Therefore, the reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.2 Dissolved Arsenic, Manganese, and Selenium Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for dissolved arsenic, manganese, and selenium using the USEPA SW-846 6010B analytical method. The reported metals results did not require qualification resulting from data validation. Therefore, the reported metals analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; TOC using the SM20 5310C analytical method; and/or metabolic fatty acids, dechlorinating bacteria, and functional genes. Holding times, laboratory blanks, matrix spike/matrix spike duplicate, laboratory duplicate precision, laboratory control samples, instrument calibrations, quantitation limits, sample result identification, and field duplicate precision were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation. The reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 GROUNDWATER SAMPLES

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

2.1.2 Dissolved Arsenic, Manganese, and Selenium

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All metals sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved arsenic, manganese, and selenium data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – GROUNDWATER

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
MW-3A	WATER	3/16/09	OK	OK		OK
MW-7A	WATER	3/17/09	OK	OK	OK	OK
MW-7B	WATER	3/17/09	OK	OK	OK	OK
MW-11B	WATER	3/18/09				OK ⁽¹⁾
MW-17A	WATER	3/16/09	OK	OK		OK
MW-17B	WATER	3/17/09	OK	OK	OK	OK
PMW-1	WATER	3/16/09	OK	OK		OK
PMW-2	WATER	3/18/09	OK	OK		OK
PMW-3	WATER	3/17/09	OK	OK	OK	OK
PMW-4	WATER	3/18/09	OK	OK		OK
PMW-8	WATER	3/18/09	OK	OK	OK	OK
PMW-80	WATER	3/18/09	OK	OK	OK	OK
INJ-01	WATER	3/17/09	OK	OK		OK
INJ-02	WATER	3/18/09	OK	OK		OK
TOTAL SAMPLES			13	13	6	14

NOTES: OK - Sample analysis considered valid and usable.
 1 - Sample analyzed for TOC only.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern Validated April 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample ID:	INJ-01 5626566/045GC-4/15	INJ-02 5626575/045GC-16/20	MW- 3A 5626562/045GC-5	MW- 7A 5626567/045GC-3/6	MW- 7B 5626565/045GC-7	MW-11B 5626577/045GC-20	MW-17A 5626561/045GC-8
		Source:	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI
		SDG:	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC
		Matrix:	Water	Water	Water	Water	Water	Water	Water
		Sampled:	3/17/2009	3/18/2009	3/16/2009	3/17/2009	3/17/2009	3/18/2009	3/16/2009
		Validated:	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/21/2009
CAS NO.	COMPOUND	UNITS:							
VOLATILES									
75-01-4	Vinyl chloride	ug/l	170	56	1 U	250	30		28
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U		1 U
75-35-4	1,1-Dichloroethene	ug/l	3.6 J	1.9 J	0.8 U	3.6 J	0.8 U		12
156-60-5	trans-1,2-Dichloroethene	ug/l	3.1 J	0.82 J	0.8 U	1.5 J	0.8 U		2.5 J
75-34-3	1,1-Dichloroethane	ug/l	33	10	1 U	140	1 U		20
156-59-2	cis-1,2-Dichloroethene	ug/l	550	150	0.99 J	620	20		210
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U		0.8 U
79-01-6	Trichloroethene	ug/l	6.2	5.4	1 U	2.9 J	1 U		29
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U		0.8 U
74-84-0	Ethane	ug/l	1 U	1 U	1 U	1 U	1 U		1 U
74-85-1	Ethene	ug/l	25	8.8	1 U	69	2.1 J		1.4 J
74-82-8	Methane	ug/l	710	260	5 J	210	150		78
METALS									
7440-38-2	Arsenic	mg/l				0.01 U	0.01 U		
7439-96-5	Manganese	mg/l				0.0473	0.101		
7782-49-2	Selenium	mg/l				0.0107 U	0.0107 U		
OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	7.2	5.7	3.7	8.8	5.3	3.8	2.3
16887-00-6	Chloride	mg/l	24.6	116	27.3	25	179		1220
14808-79-8	Sulfate	mg/l	260	297	334	253	296		170
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U		2 U

Analytical Summary Table for Chemicals of Concern Validated April 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample Id:	MW-17B 5626564/045GC-1/9	PMW-1 5626563/045GC-10	PMW-2 5626574/045GC-11	PMW-3 5626568/045GC-2/12	PMW-4 5626576/045GC-13	PMW-8 5626569/045GC-14	Dup of PMW-8 PMW-80 5626573/045GC-19
		Source:	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI	Lancaster/MI
		SDG:	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC	1136859/045GC
		Matrix:	Water	Water	Water	Water	Water	Water	Water
		Sampled:	3/17/2009	3/16/2009	3/18/2009	3/17/2009	3/18/2009	3/18/2009	3/18/2009
		Validated:	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/21/2009
CAS NO.	COMPOUND	UNITS:							
VOLATILES									
75-01-4	Vinyl chloride	ug/l	180	100	120	310	26	56	57
75-00-3	Chloroethane	ug/l	1 U	1 U	10 U	2 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	3.2 J	2.9 J	81	2.1 J	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	3.6 J	1.3 J	16 J	7.5 J	0.8 U	0.8 U	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	22	23	320	13	1 U	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	270	260	4200	900	40	40	41
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	11 J	1.6 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1.6 J	15	3400	13	1.3 J	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	8 U	1.6 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U	1.7 J	1 U	1.1 J	1 U	1 U	1 U
74-85-1	Ethene	ug/l	71	22	12	91	1 U	27	26
74-82-8	Methane	ug/l	180	1000	110	320	93	140	130
METALS									
7440-38-2	Arsenic	mg/l	0.01 U			0.01 U		0.01 U	0.01 U
7439-96-5	Manganese	mg/l	0.0933			0.103		0.0602	0.0617
7782-49-2	Selenium	mg/l	0.0107 U			0.0107 U		0.0107 U	0.0107 U
OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	3.5	10.2	4.1	22.6	3.4	4	4.1
16887-00-6	Chloride	mg/l	631	88.7	86.6	93.5	107	139	140
14808-79-8	Sulfate	mg/l	275	224	327	273	312	344	342
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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FEBRUARY 2010

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Attachment A Validated Laboratory Data

Attachment A-1 Validated Laboratory Data for the Baseline Sampling Event

Attachment A-2 Validated Laboratory Data for the 4-Week Sampling Event

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from October 15, 2009 through October 20, 2009 for the Baseline sampling event and December 10, 2009 through December 16, 2009 for the 4-Week sampling event. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI) and Microbial Insights (MI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 61 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail by sampling event in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, shipped under a COC record, and received at the laboratory within one to two days of sampling. All samples were received intact and in good condition at LLI and MI. LLI noted upon sample receipt that the volatile sample PMW-5 contained a pH of 4 during the 4-Week sampling event which exceeds the preservation requirement of pH<2 for volatile samples.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected during the Baseline sampling event were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethene; dissolved metals; chloride; bromide; sulfate; total organic carbon (TOC); metabolic acids; and dechlorinating bacteria and functional genes. The groundwater samples collected during the 4-Week sampling event were analyzed for VOCs including methane, ethane, and ethene; dissolved metals; chloride; bromide; sulfate; and total organic carbon (TOC). Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed

for each analytical method by sampling event in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,
- "N" - presumptive evidence at the value given, and
- "R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. Certain reported results for the VOC samples were qualified as estimated based upon matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy and sample preservation. The reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) for the groundwater data presented by LLI. PARCC requirements were met.

1.3.2 Dissolved Metals Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for dissolved metals using the USEPA SW-846 6010B analytical method. Certain reported metals results were qualified as estimated based upon instrument calibrations. The reported metals analytical results were 100% complete (i.e., usable) for the groundwater data presented by LLI. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; TOC using the SM20 5310C analytical method; and/or metabolic fatty acids, dechlorinating bacteria, and functional genes. Custody documentation, analytical holding times, laboratory blanks, MS/MSD precision and accuracy, laboratory duplicate precision, laboratory control sample accuracy, instrument calibrations, quantitation limits, sample result identification, and field duplicate precision were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation with the exception of the following:

- The positive bromide and sulfate results for Baseline samples collected on 10/19/09 and 10/20/09 were considered estimated, possibly biased high, and qualified "J" based upon high MS recoveries for bromide (131%R; QC limit 90-110%R) and sulfate (116%R; QC limit 90-110%R);

- The chloride results for the Baseline samples collected on 10/19/09 and 10/20/09 were considered estimated, possibly biased low, with positive results qualified “J” and nondetected results qualified “UJ” based upon a low MS recovery for chloride (84%R; QC limit 90-110%R); and
- The positive chloride and sulfate results for the 4-Week samples were considered estimated, possibly biased high, and qualified “J” based upon high MS recoveries for chloride (125%R; QC limit 90-110%R) and sulfate (113%R; QC limit 90-110%R).

The reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) for the groundwater data presented by LLI and MI. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORTS

2.1 BASELINE SAMPLING EVENT

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site for the Baseline sampling event. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy.

MS/MSD Precision and Accuracy

All precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were considered acceptable and within QC limits for all compounds of designated spiked project samples with the exception of the low MS/MSD accuracy measurements for cis-1,2-dichloroethene (51%R/53%R; QC limit 85-125%R) during the spiked analyses of sample MW-17B; and the low MS accuracy result for cis-1,2-dichloroethene (73%R; QC limit 85-125%R) during the spiked analyses of sample PMW-1. The positive cis-1,2-dichloroethene result for the parent sample MW-17B was considered estimated, possibly biased low, and qualified “J”. Validation qualification of the parent sample PMW-1 was not required for cis-1,2-dichloroethene since the MSD accuracy result was within the QC limit.

Usability

All volatile groundwater sample results including methane, ethane, and ethene from the Baseline sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A-1.

It was noted that samples INJ-01, -02, PMW-1, -2, -3, MW-7A, and -10B were diluted and reanalyzed since cis-1,2-dichloroethene, trichloroethene, and/or methane exceeded calibration ranges during the original analysis. Results from the reanalysis of these samples for the associated compounds were reported in the validated laboratory data table in Attachment A-1. In addition, the ethane reporting limits for samples INJ-01, PMW-1, and MW-7A were elevated based upon interfering peaks present on instrument chromatograms.

2.1.2 Dissolved Metals

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries

- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination and calibrations.

Blank Contamination

Two continuing calibration blanks associated with samples collected on 10/19/09 and 10/20/09 contained magnesium at concentrations of 105 and 143 µg/L. Since associated magnesium sample results were not affected by the contamination from these laboratory continuing calibration blanks, validation qualification of these samples was not required.

Calibrations

All initial and continuing calibration verifications were analyzed at the appropriate frequency with recoveries within QC limits. The contract required detection limit (CRDL) standard was analyzed at the appropriate frequency with recoveries within the 70-130%R QC limit with the exception of the high recoveries for calcium (176.3%R) and magnesium (372.1%R) in the standard associated with samples collected on 10/19/09 and 10/20/09. Therefore, positive calcium and magnesium results were considered estimated, possibly biased high, and qualified “J” for the affected samples.

Usability

All metals sample results from the Baseline sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved metals data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A-1.

2.2 4-WEEK SAMPLING EVENT

Data review has been completed for data packages generated by LLI containing groundwater samples collected from the Hyde Park site for the 4-Week sampling event. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.2-1. All of these samples were shipped under a COC record and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.2.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy.

MS/MSD Precision and Accuracy

All MS/MSD precision and accuracy measurements were considered acceptable and within QC limits for all compounds of designated spiked project samples with the exception of the high MS accuracy result for cis-1,2-dichloroethene (133%R; QC limit 85-125%R) and the low MS accuracy result for methane (17%R; QC limit 35-157%R) during the spiked analyses of sample MW-17B. Parent sample results for these compounds were not affected since sample concentrations were greater than four times the spike concentration thereby masking the spiked concentration. Validation qualification of the parent sample MW-17B was not required.

Usability

All volatile groundwater sample results including methane, ethane, and ethene from the 4-Week sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A-2.

It was noted upon sample receipt at LLI that the volatile sample PMW-5 contained a pH of 4 which exceeds the preservation requirement of $\text{pH} < 2$ for volatile samples. Therefore, all volatile results for this sample were considered estimated with positive results qualified “J” and nondetected results qualified “UJ”.

It was also noted that samples INJ-01, -04, PMW-2, -3, -30, -9, MW-7A, and -10B were diluted and reanalyzed since cis-1,2-dichloroethene, trichloroethene, vinyl chloride, methane, and/or ethene exceeded instrument calibration ranges during the initial analysis. Results from the reanalysis of these samples for the associated compounds were reported in the validated laboratory data table in Attachment A-2. In addition, the ethane reporting limits for samples MW-10B and PMW-9 were elevated based upon interfering peaks present on instrument chromatograms.

2.2.2 Dissolved Metals

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All metals sample results from the 4-Week sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved metals data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A-2.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK BASELINE SAMPLING EVENT

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
PMW-1	WATER	10/15/09	OK	OK		OK
PMW-2	WATER	10/15/09	OK	OK		OK
PMW-3	WATER	10/15/09	OK	OK	OK	OK
PMW-4	WATER	10/15/09	OK	OK		OK
INJ-01	WATER	10/15/09	OK	OK		OK
INJ-02	WATER	10/15/09	OK	OK	OK	OK
MW-7A	WATER	10/15/09	OK	OK		OK
MW-7B	WATER	10/15/09	OK	OK	OK	OK
MW-10B	WATER	10/16/09	OK	OK		OK
MW-11B	WATER	10/16/09	OK	OK		OK
PMW-6	WATER	10/19/09	OK	OK		OK
PMW-7	WATER	10/19/09	OK	OK		OK
PMW-8	WATER	10/19/09	OK	OK		OK
PMW-9	WATER	10/19/09	OK	OK		OK
MW-17A	WATER	10/20/09	OK	OK		OK
MW-17B	WATER	10/20/09	OK	OK	OK	OK
MW-170B	WATER	10/20/09	OK	OK	OK	OK
INJ-03	WATER	10/20/09	OK	OK		OK
INJ-04	WATER	10/20/09	OK	OK	OK	OK
PMW-5	WATER	10/20/09	OK	OK	OK	OK
TOTAL SAMPLES			20	20	7	20

NOTES: OK - Sample analysis considered valid and usable.

TABLE 2.2-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK 4-WEEK SAMPLING EVENT

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
INJ-2	WATER	12/10/09	OK	OK	OK	OK
INJ-4	WATER	12/10/09	OK	OK	OK	OK
PMW-2	WATER	12/10/09	OK	OK		OK
PMW-4	WATER	12/10/09	OK	OK		OK
MW-17A	WATER	12/11/09	OK	OK		OK
MW-17B	WATER	12/11/09	OK	OK	OK	OK
MW-7A	WATER	12/14/09	OK	OK		OK
MW-7B	WATER	12/14/09	OK	OK	OK	OK
PMW-3	WATER	12/14/09	OK	OK	OK	OK
PMW-30	WATER	12/14/09	OK	OK	OK	OK
INJ-1	WATER	12/14/09	OK	OK		OK
INJ-3	WATER	12/15/09	OK	OK		OK
PMW-1	WATER	12/15/09	OK	OK		OK
PMW-5	WATER	12/15/09	OK	OK	OK	OK
PMW-6	WATER	12/15/09	OK	OK		OK
PMW-8	WATER	12/15/09	OK	OK		OK
PMW-7	WATER	12/16/09	OK	OK		OK
PMW-9	WATER	12/16/09	OK	OK		OK
MW-10B	WATER	12/16/09	OK	OK		OK
MW-11B	WATER	12/16/09	OK	OK		OK
TOTAL SAMPLES			20	20	7	20

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

ATTACHMENT A-1

VALIDATED LABORATORY DATA FOR THE BASELINE SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated 2009 Baseline Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1166851		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-01 5808794 Lancaster 1166851 WATER 10/15/2009 1/25/2010	INJ-02 5808796 Lancaster 1166851 WATER 10/15/2009 1/25/2010	MW- 7A 5808797 Lancaster 1166851 WATER 10/15/2009 1/25/2010	MW- 7B 5808798 Lancaster 1166851 WATER 10/15/2009 1/25/2010	MW-10B 5808799 Lancaster 1166851 WATER 10/16/2009 1/25/2010	MW-11B 5808800 Lancaster 1166851 WATER 10/16/2009 1/25/2010
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
75-01-4	Vinyl chloride	ug/l	240	75	240	39	120	73
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	2.5 J	2.2 J	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	4.7 J	0.8 U	0.8 U	0.8 U	3.1 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	26	22	56	1 U	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	730	110	120	7.1	420	64
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	16	11	2.7 J	1 U	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	3 U	1 U	2 U	1 U	1 U	1 U
74-85-1	Ethene	ug/l	140	38	110	3.3 J	2.7 J	14
74-82-8	Methane	ug/l	2700	970	760	340	110	170
	METALS							
7429-90-5	Aluminum	mg/l		0.0802 U		0.0802 U		
7440-38-2	Arsenic	mg/l		0.0072 U		0.0072 U		
7440-70-2	Calcium	mg/l		159		148		
7439-95-4	Magnesium	mg/l		65.2		53.7		
7439-96-5	Manganese	mg/l		0.104		0.105		
7440-09-7	Potassium	mg/l		3.23		5.29		
7440-23-5	Sodium	mg/l		39.8		97.1		
	OTHER							
7440-44-0	Carbon, Total Organic (TOC)	mg/l	17.2	4.8	4.7	6.4	3.8	3.4
16887-00-6	Chloride	mg/l	78.1	99	21.1	146	121	172
14808-79-8	Sulfate	mg/l	186	250	228	250	239	221
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U

Analytical Summary Table for Chemicals of Concern Validated 2009 Baseline Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1166851		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-1 5808791 Lancaster 1166851 WATER 10/15/2009 1/25/2010	PMW-2 5808793 Lancaster 1166851 WATER 10/15/2009 1/25/2010	PMW-3 5808795 Lancaster 1166851 WATER 10/15/2009 1/25/2010	PMW-4 5808792 Lancaster 1166851 WATER 10/15/2009 1/25/2010
CAS NO.	COMPOUND	UNITS:				
VOLATILES						
75-01-4	Vinyl chloride	ug/l	74	130	57	23
75-00-3	Chloroethane	ug/l	5	5 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	76	1 J	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	1.6 J	20 J	1.4 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	51	330	5.7	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	120	5600	340	33
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	11 J	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1.6 J	4600	10	1 J
127-18-4	Tetrachloroethene	ug/l	0.8 U	4 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	7 U	1 U	3.8 J	1 U
74-85-1	Ethene	ug/l	170	16	200	1 U
74-82-8	Methane	ug/l	7800	120	3200	76
METALS						
7429-90-5	Aluminum	mg/l			0.0802 U	
7440-38-2	Arsenic	mg/l			0.0072 U	
7440-70-2	Calcium	mg/l			151	
7439-95-4	Magnesium	mg/l			59.4	
7439-96-5	Manganese	mg/l			0.103	
7440-09-7	Potassium	mg/l			4.73	
7440-23-5	Sodium	mg/l			63.9	
OTHER						
7440-44-0	Carbon, Total Organic (TOC)	mg/l	34.2	3.5	20.3	3.1
16887-00-6	Chloride	mg/l	71.4	58.6	85.9	86.9
14808-79-8	Sulfate	mg/l	163	295	208	229
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U

Analytical Summary Table for Chemicals of Concern Validated 2009 Baseline Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1167342		Sample ID:	INJ-03	INJ-04	MW-17A	MW-17B	MW-170B	PMW-5
		Lab Sample ID:	5812054	5812047	5812046	5812048	5812052	5812053
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1167342	1167342	1167342	1167342	1167342	1167342
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	10/20/2009	10/20/2009	10/20/2009	10/20/2009	10/20/2009	10/20/2009
		Validated:	12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
75-01-4	Vinyl chloride	ug/l	78	120	24	73	70	94
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	2.1 J	14	4.5 J	4.4 J	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	1.7 J	5 J	2.2 J	2.4 J	2.7 J	2.3 J
75-34-3	1,1-Dichloroethane	ug/l	6	12	29	29	29	6.5
156-59-2	cis-1,2-Dichloroethene	ug/l	130	450	200	280 J	280	140
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	4 J	24	4.2 J	4.2 J	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1.2 J	1.8 J	1 U	3 J	3 J	2.8 J
74-85-1	Ethene	ug/l	85	21	1 U	22	21	100
74-82-8	Methane	ug/l	240	160	120	120	120	290
	METALS							
7429-90-5	Aluminum	mg/l		0.0802 U		0.0802 U	0.0802 U	0.0802 U
7440-38-2	Arsenic	mg/l		0.0072 U		0.0072 U	0.0072 U	0.0072 U
7440-70-2	Calcium	mg/l		157 J		213 J	210 J	147 J
7439-95-4	Magnesium	mg/l		58.6 J		65.1 J	65.2 J	60.4 J
7439-96-5	Manganese	mg/l		0.078		0.124	0.12	0.0438
7440-23-5	Sodium	mg/l		82.1		362	365	83.6
	OTHER							
7440-44-0	Carbon, Total Organic (TOC)	mg/l	4.6	4	3.1	3	3.2	4.6
16887-00-6	Chloride	mg/l	137 J	170 J	1080 J	768 J	747 J	139 J
14808-79-8	Sulfate	mg/l	274 J	268 J	198 J	204 J	222 J	266 J
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U	2 U	2 U

Analytical Summary Table for Chemicals of Concern Validated 2009 Baseline Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1167342		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-6 5812044 Lancaster 1167342 WATER 10/19/2009 12/21/2009	PMW-7 5812045 Lancaster 1167342 WATER 10/19/2009 12/21/2009	PMW-8 5812042 Lancaster 1167342 WATER 10/19/2009 12/21/2009	PMW-9 5812043 Lancaster 1167342 WATER 10/19/2009 12/21/2009
CAS NO.	COMPOUND	UNITS:				
VOLATILES						
75-01-4	Vinyl chloride	ug/l	71	72	58	88
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	1.2 J	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	2.4 J	2.3 J	0.8 U	0.81 J
75-34-3	1,1-Dichloroethane	ug/l	6.5	5.8	1 U	9.4
156-59-2	cis-1,2-Dichloroethene	ug/l	130	200	38	92
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	2.8 J	7	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	3.3 J	2.2 J	1 U	1.6 J
74-85-1	Ethene	ug/l	80	46	13	86
74-82-8	Methane	ug/l	180	180	170	280
METALS						
7429-90-5	Aluminum	mg/l				
7440-38-2	Arsenic	mg/l				
7440-70-2	Calcium	mg/l				
7439-95-4	Magnesium	mg/l				
7439-96-5	Manganese	mg/l				
7440-23-5	Sodium	mg/l				
OTHER						
7440-44-0	Carbon, Total Organic (TOC)	mg/l	4.3	4.3	4.7	3.8
16887-00-6	Chloride	mg/l	202 J	159 J	113 J	323 J
14808-79-8	Sulfate	mg/l	260 J	267 J	295 J	214 J
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	2 U

Analytical Summary Table for Chemicals of Concern November 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 050GJ		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-01 050GJ-3 MI 050GJ-3 Water 10/15/2009	INJ-03 050GJ-19 MI 050GJ-3 Water 10/20/2009	MW-10B 050GJ-7 MI 050GJ-3 Water 10/16/2009	MW-11B 050GJ-8 MI 050GJ-3 Water 10/16/2009	MW-17A 050GJ-13 MI 050GJ-3 Water 10/20/2009	MW-17B 050GJ-14 MI 050GJ-3 Water 10/20/2009
CAS NO.	COMPOUND	UNITS:						
	FATTY ACIDS							
BVC	BVC	cells/mL	1190	117				41.9
DHB	DHB	cells/mL	37300	14000				19500
DHC	DHC	cells/mL	15100	3900				1440
TCE	TCE	cells/mL	790	109				65.1
VCR	VCR	cells/mL	6840	4300				1270
Acetic	Acetic	ug/mL	1 U	1 U	1 U	1 U	1 U	1 U
Butyric	Butyric	ug/mL	1 U	1 U	1 U	1 U	1 U	1 U
Lactic	Lactic	ug/mL	25 U	25 U	25 U	25 U	25 U	25 U
Propionic	Propionic	ug/mL	1 U	1.3	1 U	1 U	1 U	1 U
Pyruvic	Pyruvic	ug/mL	10 U	10 U	10 U	10 U	10 U	10 U

Analytical Summary Table for Chemicals of Concern November 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 050GJ		Sample ID:	MW-170B	MW-7A	MW-7B	PMW-1	PMW-3	PMW-4
		Lab Sample Id:	050GJ-17	050GJ-5	050GJ-6	050GJ-1	050GJ-4	050GJ-2
		Source:	MI	MI	MI	MI	MI	MI
		SDG:	050GJ-3	050GJ-3	050GJ-3	050GJ-3	050GJ-3	050GJ-3
		Matrix:	Water	Water	Water	Water	Water	Water
		Sampled:	10/20/2009	10/15/2009	10/15/2009	10/15/2009	10/15/2009	10/15/2009
		Validated:						
CAS NO.	COMPOUND	UNITS:	Dup of MW-17B					
FATTY ACIDS								
BVC	BVC	cells/mL		6320			5210	
DHB	DHB	cells/mL		68000			21300	
DHC	DHC	cells/mL		34100			28100	
TCE	TCE	cells/mL		791			2570	
VCR	VCR	cells/mL		20400			15200	
Acetic	Acetic	ug/mL	1 U	1 U	1 U	79	41	1 U
Butyric	Butyric	ug/mL	1 U	1 U	1 U	1 U	1 U	1 U
Lactic	Lactic	ug/mL	25 U	25 U	25 U	25 U	25 U	25 U
Propionic	Propionic	ug/mL	1 U	1 U	1 U	2.2	1 U	1 U
Pyruvic	Pyruvic	ug/mL	10 U	10 U	10 U	10 U	10 U	10 U

Analytical Summary Table for Chemicals of Concern November 2009 Monitoring Event Former Carborundum Company, Hyde Park Facility SDG: 050GJ		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-5 050GJ-18 MI 050GJ-3 Water 10/20/2009	PMW-6 050GJ-11 MI 050GJ-3 Water 10/19/2009	PMW-7 050GJ-12 MI 050GJ-3 Water 10/19/2009	PMW-8 050GJ-9 MI 050GJ-3 Water 10/19/2009	PMW-9 050GJ-10 MI 050GJ-3 Water 10/19/2009
CAS NO.	COMPOUND	UNITS:					
	FATTY ACIDS						
BVC	BVC	cells/mL	313				
DHB	DHB	cells/mL	20100				
DHC	DHC	cells/mL	7860				
TCE	TCE	cells/mL	358				
VCR	VCR	cells/mL	7220				
Acetic	Acetic	ug/mL		1 U	1 U	1 U	1 U
Butyric	Butyric	ug/mL		1 U	1 U	1 U	1 U
Lactic	Lactic	ug/mL		25 U	25 U	25 U	25 U
Propionic	Propionic	ug/mL		1 U	1 U	1.4	1 U
Pyruvic	Pyruvic	ug/mL		10 U	10 U	10 U	10 U

ATTACHMENT A-2

VALIDATED LABORATORY DATA FOR THE 4-WEEK SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated December 2009 - 4 Week Sampling Former Carborundum Company, Hyde Park Facility SDG: 1175023		Sample ID: Lab Sample ID: Source: SDG: Matrix: Sampled: Validated:	INJ-02 5863433 Lancaster 1175023 WATER 12/10/2009 2/22/2010	INJ-04 5863434 Lancaster 1175023 WATER 12/10/2009 2/22/2010	MW-17A 5863441 Lancaster 1175023 WATER 12/11/2009 2/22/2010	MW-17B 5863437 Lancaster 1175023 WATER 12/11/2009 2/22/2010	PMW-2 5863436 Lancaster 1175023 WATER 12/10/2009 2/22/2010	PMW-4 5863435 Lancaster 1175023 WATER 12/10/2009 2/22/2010
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
75-01-4	Vinyl chloride	ug/l	78	170	29	160	53	16
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	10 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	2.5 J	1.1 J	13	0.8 U	82	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	1.3 J	3.3 J	1.4 J	2.4 J	34 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	28	17	28	8.4	330	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	150	250	200	170	7100	24
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	12 J	0.8 U
79-01-6	Trichloroethene	ug/l	2.9 J	2.5 J	11	2.2 J	3600	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	8 U	0.8 U
74-84-0	Ethane	ug/l	2.7 J	3.4 J	1 U	2.4 J	1 U	1 U
74-85-1	Ethene	ug/l	61	250	1 U	130	22	1 U
74-82-8	Methane	ug/l	1400	270	100	300	250	59
	METALS							
7429-90-5	Aluminum	mg/l	0.0802 U	0.0802 U		0.0802 U		
7440-38-2	Arsenic	mg/l	0.0072 U	0.0072 U		0.0072 U		
7440-70-2	Calcium	mg/l	163	237		206		
7439-95-4	Magnesium	mg/l	60	71		73.9		
7439-96-5	Manganese	mg/l	0.182	0.3		0.192		
7440-09-7	Potassium	mg/l	3.9	6.97		5.95		
7440-23-5	Sodium	mg/l	72.2	135		152		
	OTHER							
7440-44-0	Carbon, Total Organic (TOC)	mg/l	94.8	203	3.1	264	23	3.6
16887-00-6	Chloride	mg/l	99.9 J	260 J	1060 J	171 J	41.2 J	78.8 J
14808-79-8	Sulfate	mg/l	36.2 J	12.3 J	217 J	18.3 J	292 J	226 J
24959-67-9	Bromide	mg/l	2.5	6.3	2 U	12.2	2 U	2 U

Analytical Summary Table for Chemicals of Concern Validated December 2009 - 4 Week Sampling Former Carborundum Company, Hyde Park Facility SDG: 1175308			Sample ID:	INJ-01	MW- 7A	MW- 7B	PMW-3	Dup of PMW-3
			Lab Sample ID:	5864962	5864958	5864961	5864959	5864960
			Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
			SDG:	1175308	1175308	1175308	1175308	1175308
			Matrix:	WATER	WATER	WATER	WATER	WATER
			Sampled:	12/14/2009	12/14/2009	12/14/2009	12/14/2009	12/14/2009
			Validated:	2/22/2010	2/22/2010	2/22/2010	2/22/2010	2/22/2010
CAS NO.	COMPOUND	UNITS:						
VOLATILES								
75-01-4	Vinyl chloride	ug/l	280	100	24	73	78	
75-00-3	Chloroethane	ug/l	1.7 J	1 U	1 U	1.3 J	1.5 J	
75-35-4	1,1-Dichloroethene	ug/l	0.95 J	0.8 U	0.8 U	1.2 J	1.2 J	
156-60-5	trans-1,2-Dichloroethene	ug/l	3.5 J	0.8 U	0.8 U	2.7 J	2.8 J	
75-34-3	1,1-Dichloroethane	ug/l	18	47	1 U	8.9	9.2	
156-59-2	cis-1,2-Dichloroethene	ug/l	280	140	7.7	260	250	
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
79-01-6	Trichloroethene	ug/l	7.8	1 U	1 U	6.6	6.8	
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
74-84-0	Ethane	ug/l	12	5.1	1 U	22	25	
74-85-1	Ethene	ug/l	270	100	3.6 J	750	650	
74-82-8	Methane	ug/l	7200	1900	260	11000	9500	
METALS								
7429-90-5	Aluminum	mg/l			0.0802 U	0.0802 U	0.0802 U	
7440-38-2	Arsenic	mg/l			0.0072 U	0.0072 U	0.0072 U	
7440-70-2	Calcium	mg/l			141	177	177	
7439-95-4	Magnesium	mg/l			55.7	75.1	74.4	
7439-96-5	Manganese	mg/l			0.105	0.277	0.277	
7440-09-7	Potassium	mg/l			5.75	3.12	3.28	
7440-23-5	Sodium	mg/l			110	46.4	46.9	
OTHER								
7440-44-0	Carbon, Total Organic (TOC)	mg/l	164	207	26.8	164	162	
16887-00-6	Chloride	mg/l	54.4 J	23.3 J	171 J	29 J	28.1 J	
14808-79-8	Sulfate	mg/l	14.8 J	56.2 J	220 J	22.3 J	27.5 J	
24959-67-9	Bromide	mg/l	3.6	2.4 J	2.2 J	3.1	3.3	

Analytical Summary Table for Chemicals of Concern Validated December 2009 - 4 Week Sampling Former Carborundum Company, Hyde Park Facility SDG: 1175484		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-03 5865975 Lancaster 1175484 WATER 12/15/2009 2/22/2010	PMW-1 5865974 Lancaster 1175484 WATER 12/15/2009 2/22/2010	PMW-5 5865976 Lancaster 1175484 WATER 12/15/2009 2/22/2010	PMW-6 5865977 Lancaster 1175484 WATER 12/15/2009 2/22/2010	PMW-8 5865978 Lancaster 1175484 WATER 12/15/2009 2/22/2010
CAS NO.	COMPOUND	UNITS:					
	VOLATILES						
75-01-4	Vinyl chloride	ug/l	85	89	44 J	120	79
75-00-3	Chloroethane	ug/l	1 U	1 U	1 UJ	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.89 J	0.8 UJ	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	2.2 J	1 J	2.8 J	2.9 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	6.9	21	7.8 J	6.9	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	140	67	100 J	63	63
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 UJ	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 J	1.2 J	1.8 J	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 UJ	0.8 U	0.8 U
74-84-0	Ethane	ug/l	3.1 J	5.2	3.8 J	3 J	1 U
74-85-1	Ethene	ug/l	92	78	110	160	11
74-82-8	Methane	ug/l	210	4600	270	180	120
	METALS						
7429-90-5	Aluminum	mg/l			0.0802 U		
7440-38-2	Arsenic	mg/l			0.0072 U		
7440-70-2	Calcium	mg/l			289		
7439-95-4	Magnesium	mg/l			100		
7439-96-5	Manganese	mg/l			0.316		
7440-09-7	Potassium	mg/l			8.24		
7440-23-5	Sodium	mg/l			418		
	OTHER						
7440-44-0	Carbon, Total Organic (TOC)	mg/l	607	79.8	772	383	4.5
16887-00-6	Chloride	mg/l	167 J	62 J	163 J	159 J	133 J
14808-79-8	Sulfate	mg/l	5.9 J	20.1 J	11.6 J	10.1 J	281 J
24959-67-9	Bromide	mg/l	34	2.4 J	65.6	33.4	2.5 J

Analytical Summary Table for Chemicals of Concern Validated December 2009 - 4 Week Sampling Former Carborundum Company, Hyde Park Facility SDG: 1175772		Sample ID: Lab Sample Id:	MW-10B 5867703	MW-11B 5867704	PMW-7 5867701	PMW-9 5867702
		Source:	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1175772	1175772	1175772	1175772
		Matrix:	WATER	WATER	WATER	WATER
		Sampled:	12/16/2009	12/16/2009	12/16/2009	12/16/2009
		Validated:	2/22/2010	2/22/2010	2/22/2010	2/22/2010
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
75-01-4	Vinyl chloride	ug/l	260	17	210	270
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	9	0.8 U	2.9 J	4.1 J
75-34-3	1,1-Dichloroethane	ug/l	1 U	1 U	3.3 J	3.3 J
156-59-2	cis-1,2-Dichloroethene	ug/l	750	5.3	210	450
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	1 U	2.8 J	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	3 U	1 U	4.9 J	3 U
74-85-1	Ethene	ug/l	12	81	150	110
74-82-8	Methane	ug/l	110	190	190	160
	OTHER					
7440-44-0	Carbon, Total Organic (TOC)	mg/l	4.2	7.4	230	4
16887-00-6	Chloride	mg/l	123 J	148 J	135 J	161 J
14808-79-8	Sulfate	mg/l	268 J	221 J	59.6 J	215 J
24959-67-9	Bromide	mg/l	2 U	3.6	13.6	2 J

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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LIST OF ATTACHMENTS

Attachment A Validated Laboratory Data

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from February 9, 2010 through February 11, 2010 for the Bioremediation Pilot Test 13-Week sampling event. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI) and Microbial Insights (MI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 30 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, shipped under a COC record, and received at the laboratory within one to three days of sampling. All samples were received intact and in good condition at LLI and MI. LLI noted upon sample receipt that the volatile samples INJ-3 and PMW-2 contained a pH of 4 and 7, respectively, which exceed the preservation requirement of pH<2 for volatile samples.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethene; dissolved metals; chloride; bromide; sulfate; total organic carbon (TOC); and volatile fatty acids. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,
- "N" - presumptive evidence at the value given, and
- "R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the USEPA SW-846 8015B analytical method. Certain reported results for the VOC samples were qualified as estimated based upon sample holding times. The reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) for the groundwater data presented by LLI. PARCC requirements were met.

1.3.2 Dissolved Metals Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for dissolved metals using the USEPA SW-846 6010B analytical method. The reported metals results did not require qualification resulting from data validation. The reported metals analytical results were 100% complete (i.e., usable) for the groundwater data presented by LLI. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; TOC using the SM20 5310C analytical method; and/or volatile fatty acids. Custody documentation, analytical holding times, laboratory blanks, MS/MSD precision and accuracy, laboratory duplicate precision, laboratory control sample accuracy, instrument calibrations, quantitation limits, sample result identification, and field duplicate precision were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation with the exception of the following:

- The TOC results for samples collected on 2/9/10 and 2/10/10 were considered estimated and qualified "J" based upon a high matrix recovery (144%R; QC limit 64-141%R) and laboratory duplicate precision (23%RPD; QC limit 0-20%RPD);
- The bromide results for the field duplicate samples MW-17B and MW-170B were considered estimated and qualified "J" based upon a high field duplicate precision (65%RPD; QC limit 0-30%RPD); and

- The positive bromide, chloride, and sulfate results for samples collected on 2/11/10 were considered estimated, possibly biased high, and qualified “J” based upon high matrix spike recoveries (142%R, 135%R, and 115%R, respectively; QC limit 90-110%R).

The reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) for the groundwater data presented by LLI and MI. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 13-WEEK SAMPLING EVENT

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of holding times and MS/MSD precision and accuracy.

Holding Times

All analytical holding times were within specified criteria for all samples with the exception of volatile sample INJ-03 which exceeded the 7-day holding time requirement for unpreserved volatile samples by one day. Since this sample was received by LLI at a pH = 4 which is outside

the pH<2 criteria for preserved volatile samples, results were considered estimated, possibly biased low, with positive results qualified “J” and nondetected results qualified “UJ” for this sample.

MS/MSD Precision and Accuracy

All precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were considered acceptable and within QC limits for all compounds of designated spiked project samples with the exception of the high MSD accuracy result for vinyl chloride (143%R; QC limit 66-133%R) and the high MS accuracy result for methane (300%R; QC limit 35-157%R) during the spiked analyses of sample MW-7B. Validation qualification of the parent sample MW-7B was not required for these compounds since the associated MS/MSD accuracy result was within the QC limit or sample concentration for the associated compound was greater than the spike concentration thereby masking the spiked compound.

Usability

All volatile groundwater sample results including methane, ethane, and ethene from the 13-Week sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

It was noted that samples INJ-1, -3, -4, PMW-1, -2, -3, -5, -6, -7, -9, MW-7A, -7B, -10B, -11B, -17B, 170B, were diluted and reanalyzed since cis-1,2-dichloroethene, vinyl chloride, methane, and/or ethene exceeded calibration ranges during the original analysis. Results from the reanalysis of these samples for the associated compounds were reported in the validated laboratory data table in Attachment A.

It was noted upon sample receipt at LLI that the volatile samples INJ-03 and PMW-2 contained a pH of 4 and 7, respectively, which exceed the preservation requirement of pH<2 for volatile samples. Validation qualification of sample PMW-2 was not required since this sample was analyzed within holding times for unpreserved volatile samples. However, volatile sample INJ-03 exceeded the analytical holding time requirement as discussed above and qualified accordingly.

2.1.2 Dissolved Metals

The following items were reviewed for compliancy in the metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample (LCS) recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of calibrations and LCS recoveries.

Calibrations

All initial and continuing calibration verifications were analyzed at the appropriate frequency with recoveries within QC limits. The contract required detection limit (CRDL) standard was analyzed at the appropriate frequency with recoveries within the 70-130%R QC limit with the exception of the high recoveries for aluminum (176.7%R, 220.4%R) in the standard associated with samples INJ-4 and MW-17B. Since this analyte was not detected in these samples, validation qualification was not required.

LCS Recoveries

All LCS recoveries were considered acceptable and within the 85-115%R QC limit with the exception of the high LCS recovery for aluminum (124%R) associated with samples INJ-4 and MW-17B. Since this analyte was not detected in these samples, validation qualification was not required.

Usability

All metals sample results from the 13-Week sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved metals data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK 13-WEEK SAMPLING EVENT

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
INJ-3	WATER	2/9/10	OK	OK		OK
INJ-4	WATER	2/9/10	OK	OK	OK	OK
MW-7A	WATER	2/9/10	OK	OK		OK
MW-7B	WATER	2/9/10	OK	OK	OK	OK
MW-17A	WATER	2/9/10	OK	OK		OK
MW-17B	WATER	2/9/10	OK	OK	OK	OK
MW-170B	WATER	2/9/10	OK	OK	OK	OK
PMW-1	WATER	2/9/10	OK	OK		OK
PMW-3	WATER	2/9/10	OK	OK	OK	OK
PMW-8	WATER	2/9/10	OK	OK		OK
MW-10B	WATER	2/10/10	OK	OK		OK
MW-11B	WATER	2/10/10	OK	OK		OK
PMW-5	WATER	2/10/10	OK	OK	OK	OK
PMW-6	WATER	2/10/10	OK	OK		OK
PMW-7	WATER	2/10/10	OK	OK		OK
PMW-9	WATER	2/10/10	OK	OK		OK
INJ-1	WATER	2/11/10	OK	OK		OK
INJ-2	WATER	2/11/10	OK	OK	OK	OK
PMW-2	WATER	2/11/10	OK	OK		OK
PMW-4	WATER	2/11/10	OK	OK		OK
TOTAL SAMPLES			20	20	7	20

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern Validated 2010 Bioremediation Pilot Test 13 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1182087			Sample ID: Lab Sample Id:	MW-10B 5903666	MW-11B 5903667	PMW-5 5903662	PMW-6 5903663	PMW-7 5903664	PMW-9 5903665
			Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
			SDG:	1182087	1182087	1182087	1182087	1182087	1182087
			Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
			Sampled:	2/10/2010	2/10/2010	2/10/2010	2/10/2010	2/10/2010	2/10/2010
			Validated:	3/18/2010	3/18/2010	3/18/2010	3/18/2010	3/18/2010	3/18/2010
CAS NO.	COMPOUND	UNITS:							
VOLATILES									
75-01-4	Vinyl chloride	ug/l	120	11	150	55	230	280	
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
156-60-5	trans-1,2-Dichloroethene	ug/l	4 J	0.8 U	5 J	3 J	4.3 J	3.5 J	
75-34-3	1,1-Dichloroethane	ug/l	1 U	1 U	10	6.9	3.7 J	3.2 J	
156-59-2	cis-1,2-Dichloroethene	ug/l	300	2.3 J	50	14	86	270	
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
79-01-6	Trichloroethene	ug/l	1 U	1 U	2.2 J	1 U	2.1 J	1 U	
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
74-84-0	Ethane	ug/l	1 U	1 U	8.5	5.7	3.6 J	1.3 J	
74-85-1	Ethene	ug/l	3.7 J	130	200	340	240	220	
74-82-8	Methane	ug/l	92	760	4400	3600	4400	280	
DISSOLVED METALS									
7429-90-5	Aluminum	mg/l			0.0802 U				
7440-38-2	Arsenic	mg/l			0.0072 U				
7440-70-2	Calcium	mg/l			293				
7439-95-4	Magnesium	mg/l			95.4				
7439-96-5	Manganese	mg/l			0.372				
7440-23-5	Sodium	mg/l			260				
OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	4.2 J	11.7 J	563 J	290 J	158 J	4.5 J	
16887-00-6	Chloride	mg/l	87.5	146	273	144	131	136	
14808-79-8	Sulfate	mg/l	253	50.2	15.4	12.7	41.6	201	
24959-67-9	Bromide	mg/l	2 U	2.7	36.6	16.2	7.6	2 U	

Analytical Summary Table for Chemicals of Concern Validated 2010 Bioremediation Pilot Test 13 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1182248		Sample ID: Lab Sample Id:	INJ-03 5904389	INJ-04 5904390	MW- 7A 5904394	MW- 7B 5904395	MW-17A 5904393	MW-17B 5904391	Dup of MW-17B MW-170B 5904392
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1182248	1182248	1182248	1182248	1182248	1182248	1182248
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	2/9/2010	2/9/2010	2/9/2010	2/9/2010	2/9/2010	2/9/2010	2/9/2010
		Validated:	3/18/2010	3/18/2010	3/18/2010	3/18/2010	3/18/2010	3/18/2010	3/18/2010
CAS NO.	COMPOUND	UNITS:							
VOLATILES									
75-01-4	Vinyl chloride	ug/l	170 J	60	84	21	34	52	53
75-00-3	Chloroethane	ug/l	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 UJ	0.8 U	0.8 U	0.8 U	11	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	2.8 J	3.1 J	0.8 U	0.8 U	1.3 J	1.8 J	2 J
75-34-3	1,1-Dichloroethane	ug/l	7 J	22	48	1 U	24	31	32
156-59-2	cis-1,2-Dichloroethene	ug/l	51 J	17	77	3.2 J	210	31	32
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 UJ	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 UJ	1 U	1 U	1 U	14	1.2 J	1.3 J
127-18-4	Tetrachloroethene	ug/l	0.8 UJ	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	9.9	16	1.1 J	1 U	1 U	4.2 J	4.3 J
74-85-1	Ethene	ug/l	140	540	92	6.1	1 U	190	190
74-82-8	Methane	ug/l	3300	12000	1200	650	110	4400	4700
DISSOLVED METALS									
7429-90-5	Aluminum	mg/l		0.0802 U		0.0802 U		0.0802 U	0.0802 U
7440-38-2	Arsenic	mg/l		0.0072 U		0.0072 U		0.0072 U	0.0072 U
7440-70-2	Calcium	mg/l		280		152		248	246
7439-95-4	Magnesium	mg/l		77		55		74.2	73.5
7439-96-5	Manganese	mg/l		0.535		0.0836		0.19	0.188
7440-23-5	Sodium	mg/l		120		92.4		405	389
OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	974 J	319 J	40.1 J	13.9 J	3.7 J	122 J	115 J
16887-00-6	Chloride	mg/l	178	239	24.1	157	962	727	826
14808-79-8	Sulfate	mg/l	4 J	3.3 J	87.6	248	194	32.2	33.9
24959-67-9	Bromide	mg/l	21.3	3.6	2 U	2 U	2 U	5.3 J	2.7 J

Analytical Summary Table for Chemicals of Concern Validated 2010 Bioremediation Pilot Test 13 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1182248		Sample ID: Lab Sample Id:	PMW-1 5904401	PMW-3 5904399	PMW-8 5904400
		Source:	Lancaster	Lancaster	Lancaster
		SDG:	1182248	1182248	1182248
		Matrix:	WATER	WATER	WATER
		Sampled:	2/9/2010	2/9/2010	2/9/2010
		Validated:	3/18/2010	3/18/2010	3/18/2010
CAS NO.	COMPOUND	UNITS:			
VOLATILES					
75-01-4	Vinyl chloride	ug/l	36	340	90
75-00-3	Chloroethane	ug/l	1 U	2 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	2.1 J	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	0.8 U	4.4 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	18	24	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	22	650	40
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	1.6 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	47	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	1.6 U	0.8 U
74-84-0	Ethane	ug/l	1.7 J	32	1 U
74-85-1	Ethene	ug/l	71	670	44
74-82-8	Methane	ug/l	7900	16000	220
DISSOLVED METALS					
7429-90-5	Aluminum	mg/l		0.0802 U	
7440-38-2	Arsenic	mg/l		0.0072 U	
7440-70-2	Calcium	mg/l		169	
7439-95-4	Magnesium	mg/l		67.1	
7439-96-5	Manganese	mg/l		0.158	
7440-23-5	Sodium	mg/l		37.7	
OTHER					
7440-44-0	Carbon, Total Organic (TOC)	mg/l	41.4 J	153 J	4.4 J
16887-00-6	Chloride	mg/l	72.6	29.9	121
14808-79-8	Sulfate	mg/l	28	11.7	336
24959-67-9	Bromide	mg/l	2 U	2 U	2 U

Analytical Summary Table for Chemicals of Concern: Validated 2010 Bioremediation Pilot Test 13 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 1182287		Sample ID: Lab Sample Id:	INJ-01 5904800	INJ-02 5904803	PMW-2 5904802	PMW-4 5904801
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
75-01-4	Vinyl chloride	ug/l	290	44	71	23
75-00-3	Chloroethane	ug/l	1 U	1 U	10 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	1.7 J	0.8 U	72	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	5.1	0.8 U	24 J	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	55	13	340	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	300	34	4300	22
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	11 J	0.8 U
79-01-6	Trichloroethene	ug/l	7.8	2.8 J	2900	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	8 U	0.8 U
74-84-0	Ethane	ug/l	6	1 U	1 U	1 U
74-85-1	Ethene	ug/l	360	30	41	1 U
74-82-8	Methane	ug/l	13000	4300	1800	80
	DISSOLVED METALS					
7429-90-5	Aluminum	mg/l		0.0802 U		
7440-38-2	Arsenic	mg/l		0.0072 U		
7440-70-2	Calcium	mg/l		145		
7439-95-4	Magnesium	mg/l		58		
7439-96-5	Manganese	mg/l		0.109		
7440-23-5	Sodium	mg/l		63.1		
	OTHER					
7440-44-0	Carbon, Total Organic (TOC)	mg/l	85.3	32.8	15.5	2.9
16887-00-6	Chloride	mg/l	36.7 J	92.4 J	31.8 J	87.2 J
14808-79-8	Sulfate	mg/l	14.1 J	52.5 J	310 J	260 J
24959-67-9	Bromide	mg/l	4 U	2 U	2 U	20 U

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test 13 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 023HB		Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-7A 023HB-8 MI 023HB Water 2/9/2010	MW-7B 023HB-9 MI 023HB Water 2/9/2010	MW-10B 023HB-10 MI 023HB Water 2/10/2010	MW-11B 023HB-11 MI 023HB Water 2/10/2010	MW-17A 023HB-12 MI 023HB Water 2/9/2010	MW-17B 023HB-13 MI 023HB Water 2/9/2010	PMW-1 023HB-1 MI 023HB Water 2/9/2010
CAS NO.	COMPOUND	UNITS:							
	FATTY ACIDS								
Pyruvic	Pyruvic	ug/mL	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetic	Acetic	ug/mL	54	9.6	1 U	33	1 U	360	76
Butyric	Butyric	ug/mL	1 U	1 U	1 U	1 U	1 U	17	1 U
Lactic	Lactic	ug/mL	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Propionic	Propionic	ug/mL	1 U	1 U	1 U	1 U	1 U	6.6	1.6

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test 13 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility SDG: 023HB		Sample ID: Lab Sample Id:	PMW-3 023HB-2	PMW-5 023HB-3	PMW-6 023HB-4	PMW-7 023HB-6	PMW-8 023HB-7	PMW-9 023HB-5
CAS NO.	COMPOUND	Source: SDG: Matrix: Sampled: Validated:	MI 023HB Water 2/9/2010	MI 023HB Water 2/10/2010	MI 023HB Water 2/10/2010	MI 023HB Water 2/10/2010	MI 023HB Water 2/9/2010	MI 023HB Water 2/10/2010
		UNITS:						
	FATTY ACIDS							
Pyruvic	Pyruvic	ug/mL	50 U	50 U	50 U	50 U	10 U	10 U
Acetic	Acetic	ug/mL	230	640	400	280	1 U	1 U
Butyric	Butyric	ug/mL	10	82	20	12	1 U	4.6
Lactic	Lactic	ug/mL	120 U	120 U	120 U	120 U	25 U	25 U
Propionic	Propionic	ug/mL	4.6	310	160	110	1 U	0.9

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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LIST OF ATTACHMENTS

Attachment A Validated Laboratory Data

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from March 30, 2010 through April 1, 2010 for the Bioremediation Pilot Test 20-Week sampling event. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratory for this project was Lancaster Laboratories, Inc. (LLI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 22 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, shipped under a COC record, and received at the laboratory within one day of sampling. All samples were received intact and in good condition at LLI. LLI noted upon sample receipt that the volatile samples INJ-03 and PMW-5 contained a pH of 5 and 7, respectively, which exceed the preservation requirement of pH<2 for volatile samples.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the site were analyzed for certain volatile organic compounds (VOCs) including methane, ethane, and ethene. Summaries of issues concerning these laboratory analyses are presented in Subsection 1.3.1. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,
- "N" - presumptive evidence at the value given, and
- "R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method and methane, ethane, and ethene using the USEPA approved RSK-175 analytical method. Certain reported results for the VOC samples were qualified as estimated based upon instrument calibrations. The reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) for the groundwater data presented by LLI. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 20-WEEK SAMPLING EVENT

Data review has been completed for data packages generated by LLI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were shipped under a COC record and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of continuing calibrations.

Continuing Calibrations

All continuing calibration compounds were considered acceptable with percent differences (%Ds) within the $\pm 25\%$ QC limit and relative response factors (RRFs) greater than 0.05 for all compounds with the exception of 1,1,1-trichloroethane (-29%D) associated with all samples

collected on 4/1/10. The results for this compound which were nondetects were considered estimated and qualified "UJ" for the affected samples.

Usability

All volatile groundwater sample results including methane, ethane, and ethene from the 20-Week sampling event were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

It was noted that samples INJ-01, -02, -03, -04, PMW-1, -2, -3, -5, -6, -7, -9, -10, and MW-10B were diluted and reanalyzed since cis-1,2-dichloroethene, vinyl chloride, trichloroethene, methane, and/or ethene exceeded calibration ranges during the original analysis. Results from the reanalysis of these samples for the associated compounds were reported in the validated laboratory data table in Attachment A.

It was noted upon sample receipt at LLI that the volatile samples INJ-03 and PMW-5 contained a pH of 5 and 7, respectively, which exceed the preservation requirement of pH<2 for volatile samples. Validation qualification of these samples was not required since these samples were analyzed within holding times for unpreserved volatile samples.

TABLE 2.1-1
SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK 20 -WEEK SAMPLING EVENT

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>
MW-10B	WATER	3/30/10	OK	
MW-11B	WATER	3/30/10	OK	
MW-17A	WATER	3/30/10	OK	
MW-17B	WATER	3/30/10	OK	
PMW-2	WATER	3/30/10	OK	
PMW-6	WATER	3/30/10	OK	OK
PMW-8	WATER	3/30/10	OK	
PMW-9	WATER	3/30/10	OK	
INJ-03	WATER	3/31/10	OK	OK
MW-7B	WATER	3/31/10	OK	
PMW-1	WATER	3/31/10	OK	OK
PMW-10	WATER	3/31/10	OK	OK
PMW-3	WATER	3/31/10	OK	OK
PMW-4	WATER	3/31/10	OK	
PMW-5	WATER	3/31/10	OK	OK
INJ-01	WATER	4/1/10	OK	OK
INJ-02	WATER	4/1/10	OK	OK
INJ-04	WATER	4/1/10	OK	OK
MW-7A	WATER	4/1/10	OK	
PMW-7	WATER	4/1/10	OK	OK
TOTAL SAMPLES:			20	10

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test Validated 20 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample Id	MW-10B 5942012	MW-11B 5942013	MW-17A 5942021	MW-17B 5942017	PMW-2 5942020	PMW-6 5942015	PMW-8 5942016	PMW-9 5942014
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1188362	1188362	1188362	1188362	1188362	1188362	1188362	1188362
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	3/30/2010	3/30/2010	3/30/2010	3/30/2010	3/30/2010	3/30/2010	3/30/2010	3/30/2010
		Validated:	4/26/2010	4/26/2010	4/26/2010	4/26/2010	4/26/2010	4/26/2010	4/26/2010	4/26/2010
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	90	7.1	24	10	49	43	110	250
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.8 U	10	0.8 U	100	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	3.1 J	0.8 U	1.7 J	1.7 J	26	2.6 J	0.8 U	3.4 J
75-34-3	1,1-Dichloroethane	ug/l	1 U	1 U	20	37	410	5.9	1 U	2.9 J
156-59-2	cis-1,2-Dichloroethene	ug/l	270	2.1 J	180	5.9	5200	10	75	300
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	12 J	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	1 U	11	1 U	4200	1 U	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	4 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l						1 U		
74-85-1	Ethene	ug/l						400		
74-82-8	Methane	ug/l						9100		

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test Validated 20 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility			Sample ID:	INJ-03	MW- 7B	PMW-1	Dup of PMW-1	PMW-10	PMW-3	PMW-4	PMW-5
			Lab Sample Id:	5943435	5943437	5943433	5943434	5943436	5943431	5943432	5943432
			Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
			SDG:	1188585	1188585	1188585	1188585	1188585	1188585	1188585	1188585
			Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
			Sampled:	3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010
			Validated:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010
CAS NO.	COMPOUND	UNITS:									
VOLATILES											
75-01-4	Vinyl chloride	ug/l	170	29	50	45	260	24	58		
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	2 U	1 U	1 U		
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	4.6 J	0.8 U	0.8 U		
156-60-5	trans-1,2-Dichloroethene	ug/l	3 J	0.8 U	0.94 J	0.9 J	6.5 J	0.8 U	4.4 J		
75-34-3	1,1-Dichloroethane	ug/l	5.3	1 U	9.6	9.3	23	1 U	9.2		
156-59-2	cis-1,2-Dichloroethene	ug/l	89	3.8 J	31	30	1300	31	31		
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	1.6 U	0.8 U	0.8 U		
79-01-6	Trichloroethene	ug/l	1.4 J	1 U	1.5 J	1.6 J	180	1 U	1.9 J		
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	1.6 U	0.8 U	0.8 U		
74-84-0	Ethane	ug/l	10		4.2 J	4.1 J	67		13		
74-85-1	Ethene	ug/l	140		100	97	440		310		
74-82-8	Methane	ug/l	8700		8800	7900	17000		10000		

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test Validated 20 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID:	INJ-01	INJ-02	INJ-04	MW- 7A	PMW-7
CAS NO.	COMPOUND	Lab Sample Id:	5944626	5944624	5944623	5944622	5944625
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1188739	1188739	1188739	1188739	1188739
		Matrix:	WATER	WATER	WATER	WATER	WATER
		Sampled:	4/1/2010	4/1/2010	4/1/2010	4/1/2010	4/1/2010
		Validated:	4/28/2010	4/28/2010	4/28/2010	4/28/2010	4/28/2010
		UNITS:					
	VOLATILES						
75-01-4	Vinyl chloride	ug/l	400	62	17	49	53
75-00-3	Chloroethane	ug/l	2 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	3.5 J	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	7.3 J	1.1 J	3.2 J	0.8 U	2.5 J
75-34-3	1,1-Dichloroethane	ug/l	52	16	28	39	2.8 J
156-59-2	cis-1,2-Dichloroethene	ug/l	880	50	4 J	22	40
71-55-6	1,1,1-Trichloroethane	ug/l	1.6 UJ	0.8 UJ	0.8 UJ	0.8 UJ	0.8 UJ
79-01-6	Trichloroethene	ug/l	69	2.6 J	1 U	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	1.6 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	10	1 U	16		5.3
74-85-1	Ethene	ug/l	390	81	700		300
74-82-8	Methane	ug/l	14000	7100	14000		7500

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

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Attachment A-2 Validated Laboratory Data for 26-Week Sampling Event

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from May 6, 2010 through May 14, 2010 for the Annual and 26-Week Bioremediation sampling events. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

- Work Plan,
- NYSDEC Analytical Services Protocol (ASP), and
- USEPA Region II Standard Operating Procedures (SOPs).

The analytical laboratories for this project were Lancaster Laboratories, Inc. (LLI) and Microbial Insights (MI). LLI is approved to conduct project analyses through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 29 days on average for the Hyde Park samples. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, shipped under a COC record, and received at the laboratory within one day of sampling. All samples were received intact and in good condition at LLI and MI. LLI noted upon sample receipt that the volatile sample INJ-03 contained a pH of 4 which exceeds the preservation requirement of pH<2 for volatile samples.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Hyde Park site were analyzed for volatile organic compounds (VOCs) including methane, ethane, and ethene; total iron; dissolved aluminum, arsenic, calcium, magnesium, manganese, and sodium; bromide; chloride; nitrate; nitrite; sulfate; sulfide; biochemical oxygen demand (BOD); chemical oxygen demand (COD); total organic carbon (TOC); and/or dechlorinating bacteria and functional genes. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

- "U" - not detected at the value given,
- "UJ" - estimated and not detected at the value given,
- "J" - estimated at the value given,
- "N" - presumptive evidence at the value given, and
- "R" - unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis Including Methane, Ethane, and Ethene

The groundwater samples collected from the Hyde Park site were analyzed for VOCs using the USEPA SW-846 8260B analytical method. In addition, certain groundwater samples were analyzed for methane, ethane, and ethene using the modified USEPA approved RSK-175 analytical method. Certain reported results for the VOC samples were considered estimated based upon matrix spike/matrix spike duplicate recoveries. The reported VOC and methane, ethane, and ethene analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.2 Metals Analysis

Certain groundwater samples collected from the Hyde Park site were analyzed for total iron or dissolved aluminum, arsenic, calcium, magnesium, manganese, and sodium using the USEPA SW-846 6010B analytical method. The metals results reported by the laboratory did not require qualification resulting from data validation. The reported metals analytical results were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

1.3.3 Other Parameters

Certain groundwater samples collected from the Hyde Park site were analyzed for bromide, chloride, and sulfate using the USEPA 300.0 analytical method; nitrite and nitrate using the USEPA 353.2 analytical method; sulfide using the SM20 4500 S2 D analytical method; BOD using the SM20 5210B analytical method; COD using the USEPA 410.4 analytical method; TOC using the SM20 5310C analytical method; and/or dechlorinating bacteria and functional genes. Custody documentation, holding times, laboratory blanks, matrix spike/matrix spike duplicate precision and accuracy, laboratory duplicate precision, laboratory control samples, instrument calibrations, quantitation limits, sample result identification, field duplicate precision, and completeness were reviewed for compliance. The reported results for these parameters did not require qualification resulting from data validation with the exception of the following:

- Positive bromide, chloride, and sulfate results for samples collected on 5/6/10 were considered estimated, possibly biased high, and qualified "J" based upon high matrix spike recoveries;
- Positive BOD results for samples collected on 5/6/10 were considered estimated, possibly biased high, and qualified "J" based upon a high LCS recovery;

- The bromide and chloride results for samples collected on 5/7/10 were considered estimated, possibly biased low, with positive results qualified “J” and nondetected results qualified “UJ” based upon low matrix spike recoveries for these analytes;
- Positive bromide results for samples collected on 5/10/10 were considered estimated, possibly biased high, and qualified “J” based upon a high matrix spike recovery; and
- The chloride results for samples collected on 5/12/10 were considered estimated with the positive results qualified “J” based upon a low matrix spike recovery.

The reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) based upon the groundwater data presented. PARCC requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 ANNUAL SAMPLING EVENT

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.1-1. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A-1.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank and trip blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy as discussed below.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were within QC acceptance limits for designated spiked project samples with the exception of the high MS accuracy result for cis-1,2-dichloroethene (126%R; QC limit 85-

125%R) during the spiked analyses of sample MW-5B. Validation qualification of the parent sample was not required since the MSD accuracy result for this compound was within the QC limit.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A-1.

It was noted that samples MW-2B, -10A, and -15 were diluted and reanalyzed since cis-1,2-dichloroethene and/or methane exceeded calibration ranges during the original analysis. Results from the reanalysis of these samples for the associated compounds were reported in the validated laboratory data table in Attachment A-1.

2.1.2 Total Iron

The following items were reviewed for compliancy in the total iron analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike (MS) recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries
- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All total iron sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The iron data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A-1.

2.2 26-WEEK BIOREMEDIATION SAMPLING EVENT

Data review has been completed for data packages generated by LLI and MI containing groundwater samples collected from the Hyde Park site. The specific samples contained in these data packages, the analyses performed, and a usability summary are presented in Table 2.2-1. All of these samples were shipped under a COC record and received intact by the analytical laboratory. The validated laboratory data are presented in Attachment A-2.

Data validation was performed for all samples in accordance with the most current editions of the USEPA Region II SOPs and the NYSDEC ASP for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.2.1 Volatiles Including Methane, Ethane, and Ethene

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank contamination
- Instrument performance
- Initial and continuing calibrations
- Internal standard responses
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of MS/MSD precision and accuracy as discussed below.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were within QC acceptance limits for designated spiked project samples with the exception of the low MS/MSD accuracy results for vinyl chloride (50%R/59%R; QC limit 66-133%R) and cis-1,2-dichloroethene (79%R/80%R; 85-125%R) during the spiked analyses of sample INJ-02. The positive results for these compounds were considered estimated, possibly biased low, and qualified “J” for the parent sample.

Usability

All volatile groundwater sample results including methane, ethane, and ethene were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A-2.

It was noted upon sample receipt at LLI that the volatile sample INJ-03 contained a pH of 4 which exceeds the preservation requirement of pH<2 for volatile samples. Validation qualification of this sample not required since this sample was analyzed within holding times for unpreserved volatile samples.

It was noted that samples INJ-01, -02, -03, -04, -020, PMW-1, -2, -3, -5, -6, -7, -8, and -9 were diluted and reanalyzed since cis-1,2-dichloroethene, trichloroethene, vinyl chloride, methane, and/or ethene exceeded calibration ranges during the original analysis. Results from the reanalysis of these samples for the associated compounds were reported in the validated laboratory data table in Attachment A-2.

2.2.2 Dissolved Metals

The following items were reviewed for compliancy in the dissolved metals analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration, and preparation blank contamination
- Initial and continuing calibration verifications
- Interference check sample recoveries
- Matrix spike (MS) recoveries
- Laboratory duplicate precision
- Field duplicate precision
- Laboratory control sample recoveries

- Serial dilutions
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All dissolved metals sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The dissolved metals data presented were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A-2.

TABLE 2.1-1**SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – ANNUAL SAMPLING**

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>TOTAL IRON</u>	<u>OTHER</u>
MW-7A	WATER	5/6/10	OK	OK		OK
MW-17A	WATER	5/6/10	OK	OK	OK	OK
MW-10B	WATER	5/6/10	OK	OK	OK	OK
MW-11B	WATER	5/6/10	OK	OK	OK	OK
MW-2A	WATER	5/11/10	OK	OK		
MW-2B	WATER	5/11/10	OK	OK		
MW-10A	WATER	5/11/10	OK	OK	OK	OK
MW-11A	WATER	5/11/10	OK	OK		
MW-12A	WATER	5/11/10	OK	OK		
MW-12B	WATER	5/11/10	OK	OK		
MW-16A	WATER	5/11/10	OK	OK	OK	OK
MW-16B	WATER	5/11/10	OK	OK	OK	OK
MW-160B	WATER	5/11/10	OK	OK	OK	OK
TB-051110	WATER	5/11/10	OK			
MW-18A	WATER	5/12/10	OK	OK	OK	OK
MW-18B	WATER	5/12/10	OK	OK		
MW-15	WATER	5/12/10	OK	OK		
MW-6	WATER	5/12/10	OK	OK	OK	OK
MW-8	WATER	5/12/10	OK	OK		
MW-19B	WATER	5/12/10	OK	OK		
TB-051210	WATER	5/12/10	OK			
MW-5A	WATER	5/13/10	OK	OK	OK	OK
MW-5B	WATER	5/13/10	OK	OK	OK	OK
MW-13B	WATER	5/13/10	OK	OK		
MW-14B	WATER	5/13/10	OK	OK	OK	OK
TB-051310	WATER	5/13/10	OK			
MW-4A	WATER	5/14/10	OK	OK	OK	OK
MW-4B	WATER	5/14/10	OK	OK	OK	OK
TB-051410	WATER	5/14/10	OK			
TOTAL SAMPLES			29	25	14	15

NOTES: OK - Sample analysis considered valid and usable.

TABLE 2.2-1**SUMMARY OF SAMPLE ANALYSES AND USABILITY
HYDE PARK – 26-WEEK SAMPLING**

<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLE DATE</u>	<u>VOCs</u>	<u>METHANE, ETHANE, ETHENE</u>	<u>METALS</u>	<u>OTHER</u>
MW-7A	WATER	5/6/10	OK	OK		OK
MW-7B	WATER	5/6/10	OK	OK	OK	OK
MW-10B	WATER	5/6/10	OK	OK	OK	OK
MW-11B	WATER	5/6/10	OK	OK	OK	OK
MW-17A	WATER	5/6/10	OK	OK	OK	OK
MW-17B	WATER	5/6/10	OK	OK	OK	OK
PMW-1	WATER	5/7/10	OK	OK		OK
PMW-2	WATER	5/7/10	OK	OK		OK
PMW-3	WATER	5/7/10	OK	OK	OK	OK
PMW-5	WATER	5/7/10	OK	OK	OK	OK
PMW-6	WATER	5/7/10	OK	OK		OK
PMW-7	WATER	5/7/10	OK	OK		OK
PMW-8	WATER	5/7/10	OK	OK		OK
PMW-9	WATER	5/7/10	OK	OK		OK
PMW-4	WATER	5/10/10	OK	OK		OK
INJ-01	WATER	5/10/10	OK	OK		OK
INJ-02	WATER	5/10/10	OK	OK	OK	OK
INJ-03	WATER	5/10/10	OK	OK		OK
INJ-04	WATER	5/10/10	OK	OK	OK	OK
INJ-020	WATER	5/10/10	OK	OK	OK	OK
TOTAL SAMPLES			20	20	10	20

NOTES: OK - Sample analysis considered valid and usable.

ATTACHMENT A

VALIDATED LABORATORY DATA

ATTACHMENT A-1

VALIDATED LABORATORY DATA FOR ANNUAL SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample Id:	MW- 2A 5977478	MW- 2B 5977479	MW- 4A 5980974	MW- 4B 5980975	MW- 5A 5980006	MW- 5B 5980007	MW- 6 5978534	MW- 7A 5973985
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1194165	1194165	1194704	1194704	1194549	1194549	1194351	1193608
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	5/11/2010	5/11/2010	5/14/2010	5/14/2010	5/13/2010	5/13/2010	5/12/2010	5/6/2010
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	1.2 J	7.6	45	12	84	39	48	50
75-00-3	Chloroethane	ug/l	1.7 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	4.3 J	0.8 U	2.6 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	0.8 U	0.8 U	4.9 J	0.8 U	0.97 J	0.8 U	0.8 U	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	18	1 U	21	1 U	1 U	1 U	1 U	33
156-59-2	cis-1,2-Dichloroethene	ug/l	0.8 U	3.7 J	250	2.8 J	110	36	39	65
71-55-6	1,1,1-Trichloroethane	ug/l	4.9 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	1 U	94	1 U	1 U	1.1 J	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U	1.9 J	1 U	1 U	1.8 J	1 U	1 U	1 U
74-85-1	Ethene	ug/l	1 U	55	5.7	1 U	45	1 U	23	1 U
74-82-8	Methane	ug/l	30	2300	110	160	100	63	310	5 U
	METALS									
7439-89-6	Iron	mg/l			0.581	0.0836 J	0.0522 U	0.416	0.0522 U	
	OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l			1.8	3.4	1.3	4.7	3.9	95.5
BOD	Biochemical Oxygen Demand	mg/l			2.1 U	2.7 U	1.6 U	1.2 U	3.6 U	
COD	Chemical Oxygen Demand	mg/l			12.8 U	13.3 J	15.6 J	15.6 J	22.4 J	
24959-67-9	Bromide	mg/l								2 U
16887-00-6	Chloride	mg/l			109	165	188	98.5	140 J	20.9 J
14797-55-8	Nitrate Nitrogen	mg/l			0.04 U	0.04 U	0.7	0.04 U	0.04 U	
14797-65-0	Nitrite Nitrogen	mg/l			0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	
14808-79-8	Sulfate	mg/l			249	305	126	234	217	52.2 J
18496-25-8	Sulfide	mg/l			0.054 U	0.054 U	0.054 U	0.054 U	3.4	

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID:	MW- 8	MW-10A	MW-10B	MW-11A	MW-11B	MW-12A	MW-12B	MW-13B
		Lab Sample Id:	5978535	5977480	5973990	5977481	5973991	5977482	5977483	5980005
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1194351	1194165	1193608	1194165	1193608	1194165	1194165	1194549
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	5/12/2010	5/11/2010	5/6/2010	5/11/2010	5/6/2010	5/11/2010	5/11/2010	5/13/2010
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	2.2 J	140	83	3.2 J	7.4	16	1 U	47
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	1.3 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	0.8 U	7.6	2 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	1 U	5.7	1 U	1 U	1.3 J	1.6 J	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	2.3 J	390	220	0.8 U	1.9 J	16	11	46
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
74-85-1	Ethene	ug/l	1 U	17	1 U	1 U	1 U	14	1 U	1 J
74-82-8	Methane	ug/l	140	71	5 U	51	5 U	140	5 U	65
	METALS									
7439-89-6	Iron	mg/l		2.77	0.591		0.179 J			
	OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l		1.5	4.9		14.1			
BOD	Biochemical Oxygen Demand	mg/l		1.7 U	3.5 U		64.7 J			
COD	Chemical Oxygen Demand	mg/l		38.4 J	12.8 U		132			
24959-67-9	Bromide	mg/l			2 U		2.3 J			
16887-00-6	Chloride	mg/l		784	89.5 J		114 J			
14797-55-8	Nitrate Nitrogen	mg/l		0.04 U	0.04 U		0.04 U			
14797-65-0	Nitrite Nitrogen	mg/l		0.015 U	0.015 U		0.015 U			
14808-79-8	Sulfate	mg/l		250	244 J		101 J			
18496-25-8	Sulfide	mg/l		0.054 U	0.071 J		48.3			

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID:	MW-14B	MW-15	MW-16A	MW-16B	Dup of MW-16B	MW-17A	MW-18A	MW-18B
		Lab Sample Id:	5980004	5978533	5977484	5977486	MW-160B 5977485	5973986	5978531	5978532
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1194549	1194351	1194165	1194165	1194165	1193608	1194351	1194351
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	5/13/2010	5/12/2010	5/11/2010	5/11/2010	5/11/2010	5/6/2010	5/12/2010	5/12/2010
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	33	17	180	48	47	27	2.6 J	190
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	11	1.1 J	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	1.4 J	0.8 U	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	1 U	1.3 J	1 U	1 U	1 U	20	4.2 J	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	16	5.9	10	81	80	210	51	69
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	1 U	1 U	1 U	1 U	15	25	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	20 U	1.1 J	1 U	1 U	1 U	1 U	1 U	1 U
74-85-1	Ethene	ug/l	170	140	20	2.3 J	2.6 J	1 U	1 U	2.4 J
74-82-8	Methane	ug/l	3400	1300	20	150	160	5 U	13 J	130
	METALS									
7439-89-6	Iron	mg/l	0.0522 U		0.0522 U	0.116 J	0.126 J	3.03	1.2	
	OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	14.6		7	3.8	3.9	2.9	2.1	
BOD	Biochemical Oxygen Demand	mg/l	53.6		2 U	2.1 U	2 U	3.6 U	1.6 U	
COD	Chemical Oxygen Demand	mg/l	137		40.7 J	15.6 J	27 J	29.3 J	12.8 U	
24959-67-9	Bromide	mg/l						8 U		
16887-00-6	Chloride	mg/l	143		260	105	107	729 J	104 J	
14797-55-8	Nitrate Nitrogen	mg/l	0.04 U		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	
14797-65-0	Nitrite Nitrogen	mg/l	0.015 U		0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	
14808-79-8	Sulfate	mg/l	103		1040	247	238	196 J	132	
18496-25-8	Sulfide	mg/l	46.9		0.054 U	0.3	0.25	0.054 U	0.054 U	

Analytical Summary Table for Chemicals of Concern Validated Annual Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID:	MW-19B	TB-051110	TB-051210	TB-051310	TB-051410
CAS NO.	COMPOUND	Lab Sample Id:	5978536	5977487	5978537	5980011	5980976
		Source:	Lancaster	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1194351	1194165	1194351	1194549	1194704
		Matrix:	WATER	WATER	WATER	WATER	WATER
		Sampled:	5/12/2010	5/11/2010	5/12/2010	5/13/2010	5/14/2010
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
CAS NO.	COMPOUND	UNITS:					
	VOLATILES						
75-01-4	Vinyl chloride	ug/l	2.1 J	1 U	1 U	1 U	1 U
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-Dichloroethane	ug/l	1 U	1 U	1 U	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	2.1 J	0.8 U	0.8 U	0.8 U	0.8 U
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	1 U	1 U	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U				
74-85-1	Ethene	ug/l	1 U				
74-82-8	Methane	ug/l	160				
	METALS						
7439-89-6	Iron	mg/l					
	OTHER						
7440-44-0	Carbon, Total Organic (TOC)	mg/l					
BOD	Biochemical Oxygen Demand	mg/l					
COD	Chemical Oxygen Demand	mg/l					
24959-67-9	Bromide	mg/l					
16887-00-6	Chloride	mg/l					
14797-55-8	Nitrate Nitrogen	mg/l					
14797-65-0	Nitrite Nitrogen	mg/l					
14808-79-8	Sulfate	mg/l					
18496-25-8	Sulfide	mg/l					

ATTACHMENT A-2

VALIDATED LABORATORY DATA FOR 26-WEEK SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test Validated 26 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID:	INJ-01	INJ-02	Dup of INJ-02 INJ-020	INJ-03	INJ-04	MW- 7A	MW- 7B	MW-10B
CAS NO.	COMPOUND	UNITS:	5977020/022HE-14	5977021	5977027	5977025/022HE-15	5977026	5973985/022HE-1	5973987/022HE-3	5973990/022HE-5
			Lancaster/MI	Lancaster	Lancaster	Lancaster/MI	Lancaster	Lancaster/MI	Lancaster	Lancaster/MI
			1194067/022HE	1194067	1194067	1194067/022HE	1194067	1193608/022HE	1193608/022HE	1193608/022HE
			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
			5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/6/2010	5/6/2010	5/6/2010
			6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	270	31 J	26	160	31	50	31	83
75-00-3	Chloroethane	ug/l	15	1 U	1 U	1 U	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	2.8 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	7.6	0.8 U	0.8 U	3 J	4.3 J	0.8 U	0.8 U	2 J
75-34-3	1,1-Dichloroethane	ug/l	48	11	6.9	6.4	32	33	1 U	1 U
156-59-2	cis-1,2-Dichloroethene	ug/l	600	26 J	16	71	11	65	4.5 J	220
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	90	2.1 J	1.5 J	1.7 J	1 U	1 U	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	9.8	2.4 J	2.4 J	17	11	1 U	1 U	1 U
74-85-1	Ethene	ug/l	450	68	58	220	650	1 U	1 U	1 U
74-82-8	Methane	ug/l	36000	7900	8200	13000	15000	5 U	5 U	5 U
	METALS, TOTAL									
7439-89-6	Iron	mg/l								0.591
	METALS, DISSOLVED									
7429-90-5	Aluminum	mg/l		0.0802 U	0.0802 U		0.0802 U		0.0802 U	
7440-38-2	Arsenic	mg/l		0.0072 U	0.0072 U		0.0072 U		0.0072 U	
7440-70-2	Calcium	mg/l		149	150		311		251	
7439-95-4	Magnesium	mg/l		58.4	58.1		71.4		73.7	
7439-96-5	Manganese	mg/l		0.103	0.1		0.54		0.12	
7440-23-5	Sodium	mg/l		59.5	61.6		131		426	
	OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	74.9	19.1	20.8	928	227	95.5	60.6	4.9
BOD	Biochemical Oxygen Demand	mg/l								3.5 U
COD	Chemical Oxygen Demand	mg/l								12.8 U
24959-67-9	Bromide	mg/l	2 U	2 U	2 U	24.4 J	2 U	2 U	2 U	2 U
16887-00-6	Chloride	mg/l	29.7	85.9	87.9	151	326	20.9 J	130 J	89.5 J
14797-55-8	Nitrate Nitrogen	mg/l								0.04 U
14797-65-0	Nitrite Nitrogen	mg/l								0.015 U
14808-79-8	Sulfate	mg/l	18.3	81.2	81.4	5.4	9.3	52.2 J	244 J	244 J
18496-25-8	Sulfide	mg/l								0.071 J
	DHCs/FATTY ACIDS									
BVC	BVC	cells/mL	4330			0.3 U		53.4		
DHB	DHB	cells/mL	22.8			25.3		2010		
DHC	DHC	cells/mL	25800			1630		744		
TCE	TCE	cells/mL	620			574		12.4		
VCR	VCR	cells/mL	10700			1210		571		
64-19-7	Acetic Acid	ug/mL						0.8 U	0.8 U	0.8 U
107-92-6	Butyric Acid	ug/mL						0.8 U	0.8 U	0.8 U
50-21-5	Lactic Acid	ug/mL						0.8 U	0.8 U	0.8 U
79-09-4	Propionic Acid	ug/mL						0.8 U	0.8 U	0.8 U
127-17-3	Pyruvic Acid	ug/mL						0.8 U	0.8 U	0.8 U

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test Validated 26 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample ID	MW-11B 5973991/022HE-6	MW-17A 5973986/022HE-2	MW-17B 5973988/022HE-4	PMW-1 5975653	PMW-2 5975660	PMW-3 5975654/022HE-8	PMW-4 5977019	PMW-5 5975655/022HE-9
		Source:	Lancaster/MI 1193608/022HE	Lancaster/MI 1193608/022HE	Lancaster/MI 1193608/022HE	Lancaster 1193821	Lancaster 1193821	Lancaster/MI 1193821/022HE	Lancaster 1194067	Lancaster/MI 1193821/022HE
		SDG:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampled:	5/6/2010	5/6/2010	5/6/2010	5/7/2010	5/7/2010	5/7/2010	5/10/2010	5/7/2010
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010	6/16/2010
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
75-01-4	Vinyl chloride	ug/l	7.4	27	9.6	25	52	310	27	62
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U	5 U	2 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	11	0.8 U	0.8 U	120	3.8 J	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	0.8 U	1.4 J	1.4 J	0.8 U	26	5.2 J	0.8 U	5
75-34-3	1,1-Dichloroethane	ug/l	1.3 J	20	45	7	450	19	1 U	8.1
156-59-2	cis-1,2-Dichloroethene	ug/l	1.9 J	210	8.5	42	5400	1100	31	24
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	16 J	1.6 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	15	1 U	5.8	4700	210	1 U	2.2 J
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U	4 U	1.6 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	1 U	1 U	1 U	2.4 J	1 U	64	1 U	12
74-85-1	Ethene	ug/l	1 U	1 U	1 U	74	21	650	1 U	400
74-82-8	Methane	ug/l	5 U	5 U	5 U	7800	170	22000	80	12000
	METALS, TOTAL									
7439-89-6	Iron	mg/l	0.179 J	3.03	0.248					
	METALS, DISSOLVED									
7429-90-5	Aluminum	mg/l			0.0802 U			0.0802 U		0.0802 U
7440-38-2	Arsenic	mg/l			0.0072 U			0.0072 U		0.0072 U
7440-70-2	Calcium	mg/l			148			167		368
7439-95-4	Magnesium	mg/l			53.2			70.7		97.5
7439-96-5	Manganese	mg/l			0.0772			0.187		0.518
7440-23-5	Sodium	mg/l			84.9			34.8		186
	OTHER									
7440-44-0	Carbon, Total Organic (TOC)	mg/l	14.1	2.9	12.7	12.5	4	104	3	613
BOD	Biochemical Oxygen Demand	mg/l	64.7 J	3.6 U	157 J					
COD	Chemical Oxygen Demand	mg/l	132	29.3 J	219					
24959-67-9	Bromide	mg/l	2.3 J	8 U	2 U	2 UJ	2 UJ	2 UJ	2 U	18.5 J
16887-00-6	Chloride	mg/l	114 J	729 J	883 J	49.4 UJ	24.9 J	22.3 J	70.7	137 J
14797-55-8	Nitrate Nitrogen	mg/l	0.04 U	0.04 U	0.04 U					
14797-65-0	Nitrite Nitrogen	mg/l	0.015 U	0.015 U	0.015 U					
14808-79-8	Sulfate	mg/l	101 J	196 J	49.7 J	50.8	311	7.5	222	8.3
18496-25-8	Sulfide	mg/l	48.3	0.054 U	14.3					
	DHCs/FATTY ACIDS									
BVC	BVC	cells/mL			94			12900		3.9
DHB	DHB	cells/mL			488			0.5 U		2.6
DHC	DHC	cells/mL			15100			48100		9520
TCE	TCE	cells/mL			716			5990		305
VCR	VCR	cells/mL			13300			20800		8340
64-19-7	Acetic Acid	ug/mL	0.8 U	0.8 U	0.8 U					
107-92-6	Butyric Acid	ug/mL	0.8 U	0.8 U	0.8 U					
50-21-5	Lactic Acid	ug/mL	0.8 U	0.8 U	0.8 U					
79-09-4	Propionic Acid	ug/mL	0.8 U	0.8 U	0.8 U					
127-17-3	Pyruvic Acid	ug/mL	0.8 U	0.8 U	0.8 U					

Analytical Summary Table for Chemicals of Concern 2010 Bioremediation Pilot Test Validated 26 Week Groundwater Sampling Event Former Carborundum Company, Hyde Park Facility		Sample ID: Lab Sample Id	PMW-6 5975656	PMW-7 5975657	PMW-8 5975658	PMW-9 5975659
		Source:	Lancaster	Lancaster	Lancaster	Lancaster
		SDG:	1193821	1193821	1193821	1193821
		Matrix:	WATER	WATER	WATER	WATER
		Sampled:	5/7/2010	5/7/2010	5/7/2010	5/7/2010
		Validated:	6/16/2010	6/16/2010	6/16/2010	6/16/2010
CAS NO.	COMPOUND	UNITS:				
VOLATILES						
75-01-4	Vinyl chloride	ug/l	56	55	130	230
75-00-3	Chloroethane	ug/l	1 U	1 U	1 U	1 U
75-35-4	1,1-Dichloroethene	ug/l	0.8 U	1.6 J	0.8 U	0.8 U
156-60-5	trans-1,2-Dichloroethene	ug/l	2.9 J	2.3 J	0.8 U	1.8 J
75-34-3	1,1-Dichloroethane	ug/l	5.8	11	1 J	3.3 J
156-59-2	cis-1,2-Dichloroethene	ug/l	15	92	92	200
71-55-6	1,1,1-Trichloroethane	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	Trichloroethene	ug/l	1 U	13	1 U	1 U
127-18-4	Tetrachloroethene	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
74-84-0	Ethane	ug/l	7.4	4.2 J	1 U	1.4 J
74-85-1	Ethene	ug/l	430	250	82	230
74-82-8	Methane	ug/l	12000	6000	1000	710
METALS, TOTAL						
7439-89-6	Iron	mg/l				
METALS, DISSOLVED						
7429-90-5	Aluminum	mg/l				
7440-38-2	Arsenic	mg/l				
7440-70-2	Calcium	mg/l				
7439-95-4	Magnesium	mg/l				
7439-96-5	Manganese	mg/l				
7440-23-5	Sodium	mg/l				
OTHER						
7440-44-0	Carbon, Total Organic (TOC)	mg/l	296	85.9	6.6	7.9
BOD	Biochemical Oxygen Demand	mg/l				
COD	Chemical Oxygen Demand	mg/l				
24959-67-9	Bromide	mg/l	8.9 J	2 UJ	2 UJ	5.4 J
16887-00-6	Chloride	mg/l	147 J	318 J	107 J	147 J
14797-55-8	Nitrate Nitrogen	mg/l				
14797-65-0	Nitrite Nitrogen	mg/l				
14808-79-8	Sulfate	mg/l	11.7	63.4	240	134
18496-25-8	Sulfide	mg/l				
DHCs/FATTY ACIDS						
BVC	BVC	cells/mL				
DHB	DHB	cells/mL				
DHC	DHC	cells/mL				
TCE	TCE	cells/mL				
VCR	VCR	cells/mL				
64-19-7	Acetic Acid	ug/mL				
107-92-6	Butyric Acid	ug/mL				
50-21-5	Lactic Acid	ug/mL				
79-09-4	Propionic Acid	ug/mL				
127-17-3	Pyruvic Acid	ug/mL				