SUMMARY REPORT FOR THE FALL 2015 ANNUAL GROUNDWATER MONITORING EVENT

Former Carborundum Company, Hyde Park Facility (Site No. 932036)

Town of Niagara, Niagara County, NY

SUBMITTED TO:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

SUBMITTED BY:

Atlantic Richfield Company

A BP affiliated company

201 Helios Way
Houston, Texas 77079

PREPARED BY:

PARSONS

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

FEBRUARY 2016

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February 19, 2016

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 Globar, Site No. 932036
Town of Niagara, Niagara County
Fall 2015 Annual Monitoring Report and Five-Year Review Report

Dear Mr. Hinton:

Enclosed is the Fall 2015 Annual Monitoring Report, containing results of sampling conducted in November 2015. Please note that Appendix A of the enclosed report contains the Five-Year Review report, which summarizes the investigation, remediation and monitoring activities from 2010 to 2015. If you have any questions regarding this report, feel free to contact Michael Teeling at (585) 813-8140.

Sincerely,

Mark S. Raybuck

Mark Raybuck
Project Manager

cc: M. Teeling (Atlantic Richfield)
M. Forcucci (NYSDOH)
Town Clerk (Town of Niagara, document repository)

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SECTION 1
INTRODUCTION

This Fall 2015 annual report summarizes the groundwater monitoring activities completed at the Former Carborundum Company Hyde Park Facility (Site) in the Town of Niagara, New York. This report provides the results from the recent Fall 2015 sampling event conducted from November 16 to 23, 2015, with a comparison to previous results. The annual groundwater monitoring is conducted on an alternating spring/fall schedule, and includes the collection of groundwater samples for the analysis of chlorinated volatile organic compounds (CVOCs) and natural attenuation parameters. This report also includes the Five-Year Review report, which is provided in Appendix A.

This work was completed in accordance with the groundwater monitoring work plan (DE&S 2000) for Operable Unit 2 (OU2), approved by the New York State Department of Environmental Conservation (NYSDEC), correspondence from NYSDEC dated September 28, 2005 (NYSDEC 2005) and April 8, 2014 (NYSDEC 2014), and letters to NYSDEC dated August 20, 2013 (Parsons 2013) and April 3, 2014 (Parsons 2014).

The scope of the Fall 2015 groundwater monitoring event included:

- Collection of water level measurements from overburden and bedrock monitoring wells;
- Purging of overburden and bedrock monitoring wells and collecting field measurements of pH, temperature, specific conductivity, oxidation/reduction potential (ORP), dissolved oxygen (DO), total dissolved solids (TDS), and turbidity;
- Collection of groundwater samples from monitoring wells for specific chlorinated volatile organic compound (CVOC) analyses; and
- Collection of groundwater samples from selected overburden and bedrock monitoring wells for analysis of natural attenuation parameters.

A Site location map is provided as Figure 1.1, and a Site plan is included as Figure 1.2.

SECTION 2
SITE REMEDIAL SUMMARY

The following section briefly summarizes the remedial work completed at the Site. Primary tasks included emulsified vegetable oil substrate injections in 2008, 2009, 2011 and 2013, and associated performance groundwater sampling events. Terra Systems, Inc. (TSI) SRS®-SD was used for all overburden injections, SRS®-FR was used for all bedrock injections, and TSI-DC® bioaugmentation culture was used for microorganism bioaugmentation. A more detailed Site background and remedial summary is presented in the Five-Year Review Report (Appendix A).

The following is a timeline of key remedial actions and associated groundwater monitoring:

Task	Start & Completion Date
2008 Injection Event	
Baseline Performance Monitoring	August 2008
Overburden Substrate Injection (INJ-1 and INJ-2)	September 4 –5, 2008
Overburden Bioaugmentation (INJ-1 and INJ-2)	October 21 – 22, 2008
Performance Groundwater Monitoring	October 2008, December 2008, January 2009, March 2009
2009 Injection Event	
Baseline Groundwater Monitoring	October 2009
Bedrock Substrate Injections (INJ-3 and INJ-4)	November 11 – 12, 2009
Overburden Substrate Injections (INJ-1 and INJ-2)	November 17 – 18, 2009
Overburden and Bedrock Bioaugmentation (INJ-1 through INJ-4)	December 17 – 22, 2009
Performance Groundwater Monitoring	December 2009, February 2010, March-April 2010, May 2010

Task	Start & Completion Date
2011 Injection Event	
Overburden Injection Well Installation (INJ-5U, INJ-5L, INJ-6U, INJ-6L, INJ-7, INJ-8, INJ-9, INJ-10)	October 6 – 20, 2011
Baseline Sampling	October 20 – November 7, 2011
Overburden Substrate Injections and Bioaugmentation (INJ-1, INJ-2, INJ-5U, INJ-5L, INJ-6U, INJ-6L, INJ-7, INJ-8, INJ-9, INJ-10)	November 11 – December 13, 2011
3-month Performance Sampling	March 12 – 15, 2012
6-month Performance Sampling	June 11 – 18, 2012
12-month Performance Sampling	November 26 – 30, 2012
2013 Injection Event	
Overburden and Bedrock Substrate Injections and Bioaugmentation (INJ-1, INJ-2, INJ-3, INJ-4, MW-16B, MW-18B, INJ-9, INJ-10)	September 9 – October 1, 2013
Tracer Dye Injections (MW-16B, MW-18B)	September 19 – 24, 2013
Tracer Dye Sampling	September 20, 2013 – January 17, 2014
3-month Performance Sampling	January 13 – 20, 2014
6-month Performance Sampling	March 30 – April 3, 2014
12-month Performance Sampling	October 8 – 14, 2014

SECTION 3
GROUNDWATER MONITORING PROGRAM METHODOLOGY

The Fall 2015 annual groundwater monitoring program included water level measurements, groundwater sampling, and submission of groundwater samples for analysis of CVOCs. Samples from seven monitoring well couplets (overburden and bedrock) were also analyzed for natural attenuation parameters. Quality assurance/quality control (QA/QC) samples, including two field duplicates, two matrix spike/matrix spike duplicate samples and seven trip blanks were also collected and submitted for analysis (Appendix B, Data Usability Summary Report).

3.1 WATER LEVEL MONITORING

Water levels were measured on November 16, 2015 in the monitoring wells relative to the top of the inner well casing using an electronic water level tape accurate to 0.01 ft. The depth to water was measured in each well from a surveyed point on the casing. The water levels were then converted to elevations presented as feet above mean sea level (ft AMSL, NAVD 88 datum). The groundwater elevations were used to construct groundwater elevation contour maps in both the overburden and bedrock zones.

3.2 GROUNDWATER SAMPLING AND ANALYSIS

The locations of the monitoring wells are shown in Figure 1.2. Wells were sampled following the methodology outlined in the groundwater monitoring work plan (DE&S 2000), and approved revisions per subsequent correspondence with NYSDEC. A list of wells, dates sampled, sample IDs, and purge volumes is provided in Table 3.1. A copy of the groundwater sampling logs is provided in Appendix C.

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 ferrous iron, carbon dioxide, hydrogen sulfide, and alkalinity, using Hach™ test kits.

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 Eurofins/Lancaster Laboratories, Inc. (LLI) in Lancaster, PA. Table 3.2 provides a summary of sample collection and analysis specifications for each analysis type including sample containers, preservation methods, analytical methods, and other information.

Samples from each well were analyzed for CVOCs, including tetrachloroethene, (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE) and trans-1,2-dichloroethene, 1,1-dichloroethene, 1-1,dichloroethane (DCA), 1-1-1-, trichloroethane, vinyl chloride (VC), and chloroethane.

In addition, samples from several well pairs (overburden and bedrock) were analyzed for natural attenuation evaluation parameters, consisting of methane, ethane, ethene, chloride, sulfate, total organic carbon, biochemical oxygen demand, chemical oxygen demand, dissolved iron, nitrate, nitrite, and sulfide. The seven well clusters chosen for these additional analyses are located within, upgradient, downgradient, and side gradient of the source area, and consist of MW-5A and B, MW-7A and B, MW-10A and B, MW-12A and B, MW-16A and B, MW-17A and B, and MW-18A and B.

Purge water and decontamination water were contained and staged in holding tanks for later disposal. Following receipt of sample results, the water was discharged to the sanitary sewer under a permit with the Niagara Falls Water Board.

3.3 DATA VALIDATION

Analytical results from samples collected between November 16 - 23, 2015 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 Eurofins/Lancaster Laboratories. This laboratory is approved to conduct project analyses through the New York State Department of Health (NYSDOH) 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 in accordance with the most current editions of the USEPA Region II SOPs and NYSDEC ASP for organic and inorganic data review.

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

SECTION 4
GROUNDWATER MONITORING PROGRAM SUMMARY

4.1 GROUNDWATER ELEVATIONS AND FLOW DIRECTIONS

A summary of the groundwater elevations for the Fall 2015 event is provided in Table 4.1. Table 4.1 also includes location coordinates, top of casing and ground surface elevations for the monitoring wells.

Groundwater in the overburden monitoring wells was measured at depths between 3.2 and 14.4 feet below ground surface (bgs). An overburden groundwater contour map was developed based on the November 16, 2015 water levels (Figure 4.1). The overburden groundwater flow direction is to the southwest, towards Hyde Park Boulevard and Rhode Island Avenue, consistent with historical data.

Groundwater in the bedrock monitoring wells was measured at depths between 3.3 and 11.7 feet bgs. A bedrock groundwater potentiometric surface contour map was developed based on the November 16, 2015 water levels (Figure 4.2). Consistent with historical observations of groundwater flow, the bedrock groundwater flow direction is south/southwesterly towards Hyde Park Boulevard and Rhode Island Avenue.

4.2 GROUNDWATER SAMPLING RESULTS

The sampling matrix for the Fall 2015 sampling event is provided in Table 4.2. Field measurements collected for the Fall 2015 sampling event are provided in Table 4.3. Summaries of the CVOCs and natural attenuation parameter results are included in Table 4.4. The complete analytical data results are included in Appendix D.

4.2.1 Long-Term Bioremediation Results

Figure 4.3 illustrates the long-term time-series plots for total CVOCs at source area and downgradient wells indicating the unequivocal improvement in groundwater conditions that has occurred as the result of enhanced bioremediation activities. Source area wells MW-4A, MW-7A, and MW-17B exhibited mainly steady, elevated levels of total CVOCs prior to injections, followed by significant, two to three order of magnitude decreases in concentration following the injections.

Bioremediation injections from 2008 to 2013 were also intended to decrease total CVOCs in downgradient wells over time. Downgradient wells MW-11B, MW-12B, MW-14B, and MW-15 exhibited slowly decreasing levels of total CVOC concentrations prior to injections, followed by significant decreases of

approximately two orders of magnitude relative to pre-2008 total CVOC concentrations (Figure 4.3).

4.2.2 CVOC Results

Groundwater samples from 22 monitoring wells (8 overburden, 14 bedrock) were collected and analyzed for CVOCs. Overall, with the exception of the current results from MW-5A and MW-16B, concentrations of these CVOCs have decreased or remained stable since 2000. Reductions are due to both natural attenuation and enhanced biodegradation that included four rounds of vegetable oil substrate injections in 2008, 2009, 2011, and 2013.

Figures 4.4 through 4.11 are examples that illustrate long-term trends for six overburden and ten bedrock wells. The time-series plots typically show gradual decreasing trends in TCE and DCE, and in some cases stable trends, followed by significant decreases in concentrations following injection events. Most of these plots show stable VC concentrations prior to the injections, followed by significant decreases after the injections.

4.2.2.1 Overburden Results

Figure 4.12 shows a summary of the overburden well CVOC analytical results from the Fall 2015 sampling event, the data from the six previous annual sampling events, and data from 2000 as a reference point. The results for the eight overburden groundwater samples were generally consistent with previous rounds of monitoring and long-term trends. Key observations are listed below.

<u>Overburden Source Area Wells:</u>

- Concentrations of TCE, DCE, DCA, and VC in MW-7A in November 2015 were significantly less than historical levels, and with the exception of VC, were below detected concentrations in April 2014 (Figures 4.4 and 4.12). MW-7A was in the area of highest CVOCs in shallow groundwater prior to the first injection, and was within the area that was targeted during the emulsified vegetable oil substrate injections in 2008, 2009, 2011 and 2013.

- MW-4A, where a localized area of CVOCs had been observed, was targeted in the November 2011 and September 2013 injection events. Concentrations of TCE, DCE, and VC in MW-4A have decreased or remained stable from 2014 to 2015 and are at the lowest recorded levels since 2000 (Figures 4.4 and 4.12). MW-4A is one of only two overburden locations sampled where TCE was detected at low concentrations (1.2 µg/L) in November 2015.

- MW-16A was targeted in the November 2011 injection event, but only a negligible amount of substrate was injected due to low permeability of the soils. Concentrations of TCE, DCA and DCE in MW-16A have either decreased or remained stable, whereas VC levels have increased from 140 µg/L in 2014 to 250 µg/L in 2015 (Figures 4.5 and 4.12).

Overburden Downgradient Wells:

- MW-5A, located south of the former facility building, showed sporadic increases and decreases in DCE and VC before and after substrate injections in 2009, 2011, and 2013 (Figures 4.5 and 4.12). Degradation products DCE, VC, and DCA in MW-5A have decreased in November 2015. Ethene concentrations have decreased from 110 µg/L in April 2014 to 39 µg/L in November 2015. There appears to be a direct relationship between degradation product concentrations and water level fluctuations in MW-5A (Figure 4.5). Furthermore, there is a consistent upward hydraulic gradient between the bedrock and overburden zones at this location. MW-5A will continue to be monitored as a part of the annual sampling program.

- Elevated concentrations of TCE breakdown products (DCE and VC) continued to be detected in samples from well MW-10A (Figures 4.6 and 4.12), located south of the building. TCE remained below analytical detection limits at this location in 2015. Groundwater measurements indicate an upward hydraulic gradient between MW-10A and MW-10B (from bedrock to overburden).

- MW-12A, located west of the former facility building along Hyde Park Boulevard, continued to show decreases in DCE and VC compared to historical (2000-2008) concentrations (Figures 4.6 and 4.12). These decreases may be the result of natural attenuation, as MW-12A was not the target of any of the overburden injection events from 2008 to 2013.

4.2.2.2 Bedrock Results

Bedrock Results: Figure 4.13 shows a summary of the bedrock well CVOC analytical results from the Fall 2015 sampling event, the data from the six previous annual sampling events, and data from 2000 as a reference point. Key observations are listed below.

Bedrock Source Area Wells:

- For the past six years, TCE and DCE concentrations in MW-17B (< 0.5 µg/L 2015) have remained appreciably lower than historical concentrations (3.1 µg/L and 280 µg/L respectively in 2009) (Figures 4.7

and 4.13). VC concentrations at MW-17B have decreased by two orders of magnitude over the course of the bioremediation injections to 0.8 µg/L in November 2015. MW-17B is located within the area of the bedrock emulsified vegetable oil substrate injection in November 2009 and the September 2013 bioremediation injection, and was the location of the highest CVOCs in bedrock prior to bioremediation activities.

- DCE and VC concentrations have decreased in MW-18B from April 2014 to November 2015 (43 µg/L to 35 µg/L DCE, 71 µg/L to 40 µg/L VC) (Figures 4.7 and 4.13). Vegetable oil substrate was injected into MW-18B during the September 2013 injection event.

- TCE, DCE, and VC concentrations increased at MW-16B in early 2012 after using overburden injection wells (INJ-6L, INJ-7 and INJ-8) installed in the vicinity of MW-16A for the October 2011 injections. Increases in DCE and VC were also observed following the 2013 substrate injections. Subsequently, DCE and VC concentrations decreased in MW-16B from April 2014 to November 2015 (2,300 µg/L to 1,100 µg/L DCE, 2,000 µg/L to 780 µg/L VC) (Figures 4.8 and 4.13). MW-16B is one of only two bedrock locations sampled where TCE was detected (4.8 µg/L) in November 2015. Vegetable oil substrate was injected into MW-16B during the September 2013 injection event.

Bedrock Downgradient Wells:

- Downgradient monitoring well MW-5B is one of only two bedrock locations sampled in November 2015 where TCE was detected at low concentrations (0.58 µg/L). DCE and VC concentrations have remained relatively stable over the course of the injections (Figures 4.8 and 4.13).

- Significant reductions in TCE, DCE, and VC concentrations were observed in downgradient monitoring wells MW-11B and MW-14B relative to concentrations measured prior to bioremediation injections (Figures 4.9 and 4.13). TCE, DCE, VC and DCA concentrations at wells MW-11B and MW-14B were near or below analytical detection limits in 2015.

- DCE concentrations at MW-10B consistently ranged from 180 µg/L to 370 µg/L from 2007 to 2010 before increasing to 960 µg/L in 2011. DCE concentrations then decreased to 280 µg/L in 2012, 230 µg/L in 2013, and 190 µg/L in 2014 and 2015 which are consistent with historical values. The VC concentration in 2015 (190 µg/L) is comparable to historical concentrations at MW-10B since 2002 (Figures 4.10 and 4.13).

- Concentrations of DCE and VC have decreased significantly in downgradient monitoring well MW-12B from 2014 to 2015, and are similar to concentrations measured in 2012 following bedrock injections in 2009. Concentrations of CVOCs at this location are less than historical concentrations measured prior to bioremediation injections (Figures 4.10 and 4.13).

- Decreasing concentrations of CVOCs in downgradient monitoring wells MW-13B and MW-15 have been observed since injections began in 2008 (Figures 4.11 and 4.13). The NYSDEC approved a decrease in the frequency of the groundwater monitoring for MW-15 from annually to every five years (NYSDEC, 2014), and MW-15 was not sampled in 2015. MW-15 is scheduled to be sampled during the 2018 annual sampling event.

4.2.3 Attenuation Monitoring Results

As part of the ongoing groundwater monitoring program, natural attenuation parameters were sampled during each monitoring event (Table 4.4 and Appendix D). The results for 2015 were generally consistent with previous monitoring events, with the following exceptions:

- A decrease in total organic carbon (TOC) from 2014 to 2015 was observed in wells targeted during the 2013 injections, including overburden wells MW-4A and MW-7A, and bedrock wells MW-16B, MW-17B, and MW-18B. 2015 TOC concentrations in these wells, however, remained above pre-injection concentrations.

- From April 2014 to November 2015, an increase in ethene concentrations at wells MW-10B (2.3 µg/L to 190 µg/L), MW-16A (20 µg/L to 95 µg/L), and MW-16B (700 µg/L to 920 µg/L) were noted. Ethene is the final degradation product of TCE, providing solid evidence of substantial biodegradation. MW-16B was an injection location in 2013, and MW-16A was an injection location in 2011, although a negligible amount of substrate was injected due to low permeability of the soils. MW-10B is located downgradient, and south of the building.

- Elevated methane concentrations (>20 mg/L) are noted in several wells, indicating an environment conducive to anaerobic biodegradation.

Overall, the environmental conditions and Site-wide long-term changes in concentrations indicate that natural attenuation and enhanced biodegradation are ongoing, active processes.

SECTION 5
CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations were developed following the Fall 2015 groundwater sampling event:

Conclusions:

- CVOC concentrations have steadily declined in the overburden and bedrock groundwater over the past 13 years, with more recent substantial declines related to the 2008, 2009, 2011, and 2013 bioremediation injections.
- A notable decrease in CVOC concentrations was observed in MW-4A, following the November 2011 emulsified vegetable oil substrate injections. MW-7A, located in the area of the vegetable oil substrate injections conducted in September 2008, November 2009, November 2011, and September 2013, continued to show decreased levels of CVOCs. Fluctuations in concentrations of CVOC degradation products at MW-5A appear to have a direct relationship with water level fluctuations, and are consistent with historical concentrations following substrate injections. Overall, overburden groundwater CVOC concentrations in 2015 were generally consistent with the previous monitoring program results.
- Bedrock groundwater CVOC concentrations generally showed declines related to the previous substrate injections. Notably, CVOC concentrations decreased substantially in several downgradient bedrock monitoring wells since 2009. TCE was non-detect in all wells except MW-5B and MW-16B. Current DCE and VC concentrations at MW-16B have decreased from April 2014 to November 2015, but previous increases in CVOC concentrations at MW-16B following the 2011 and 2013 substrate injections were observed and will continue to be monitored.
- Groundwater samples for natural attenuation monitoring have been collected since October 2000, and continue to indicate that natural attenuation processes are active. The results for 2015 were generally consistent with previous monitoring events, with decreases in TOC concentrations at 2013 injection locations and increases in ethene concentrations (final degradation product) noted in certain wells.
- Natural anaerobic biodegradation of TCE, which was occurring at the Site prior to 2008, was substantially enhanced by the bioremediation injection program conducted over multiple years.

Recommendations:

- At present, CVOCs within the source area and downgradient of that area have decreased such that further injections to enhance the natural attenuation process are not required.
- Assuming the Spring 2016 groundwater sampling results are comparable to the 2015 groundwater results, it is recommended that the current monitoring frequency and number of sampling locations be reduced. Details of proposed changes in the monitoring program will be submitted following the Spring 2016 Annual Monitoring Report.

SECTION 6
REFERENCES

NYSDEC. 1998. Division of Water Technical Guidance Series (1.1.1). Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. New York State Department of Environmental Conservation. June 1998.

DE&S 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.

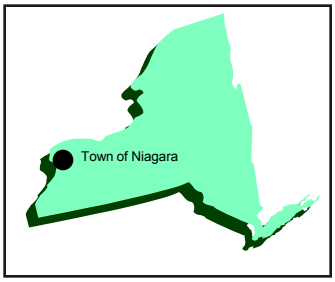
NYSDEC 2005. Letter to Mr. William Barber (BP) from Michael Hinton (NYSDEC) re: Carborundum Globar Site No. 932036, Town of Niagara, Niagara County, New York. Summary Report for the Fifth Year of the Groundwater Monitoring Program. NYSDEC, September 28, 2005.

NYSDEC 2014. Letter to Mr. William Barber (BP) from Michael Hinton (NYSDEC) re: Carborundum Globar Site No. 932036, Town of Niagara, Niagara County, New York. Proposed Revision to Annual Sampling MW-15. NYSDEC, April 8, 2014.

Parsons, 2013. Letter to NYSDEC regarding modifications to the Fall 2013 monitoring event. August 20, 2013.

Parsons, 2014. Letter to NYSDEC regarding Proposed Revision to Annual Sampling- MW-15. April 3, 2014.

FIGURES



New York

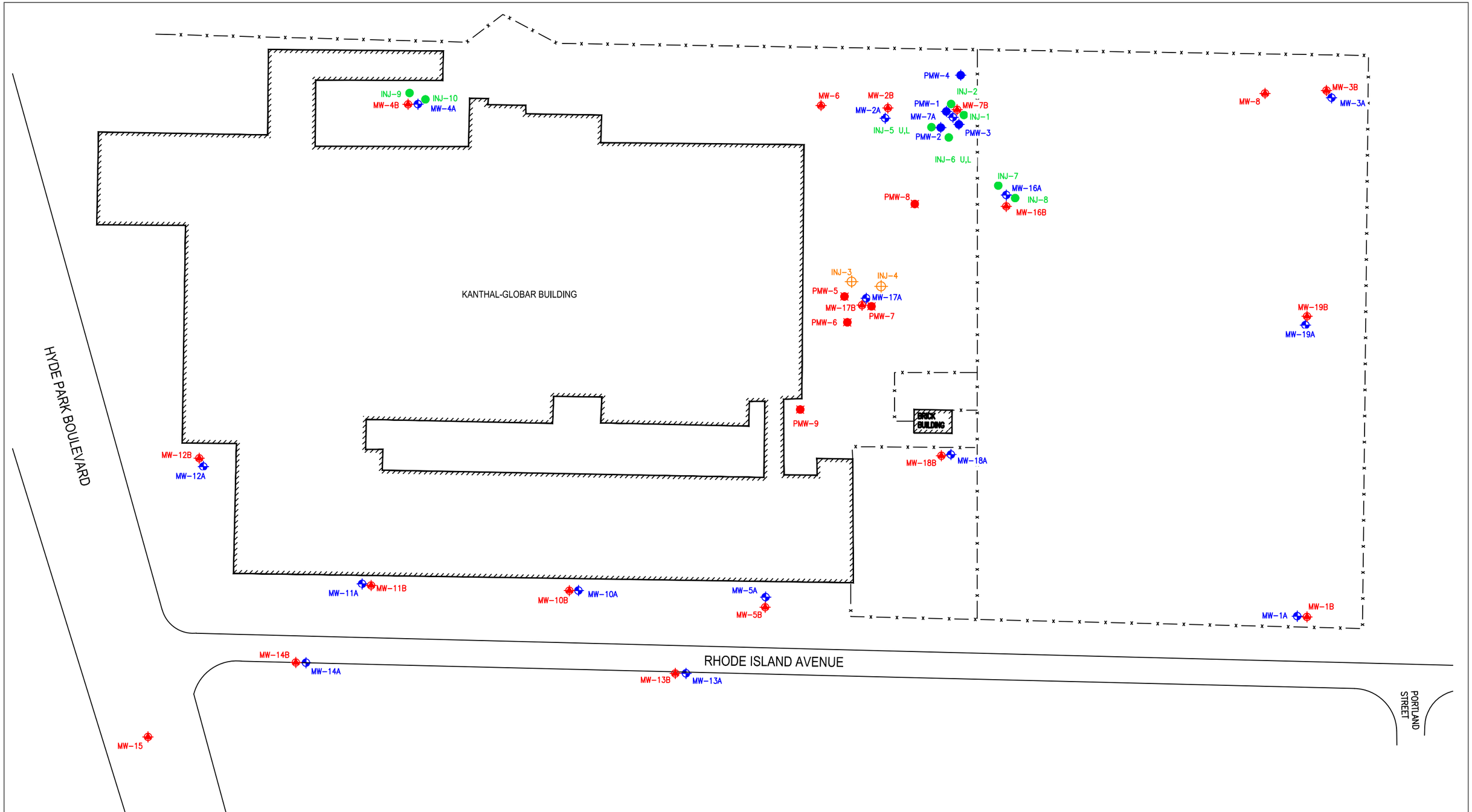
N

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	FENCE
MW-5A	OVERBURDEN MONITORING WELL LOCATION
PMW-1	OVERBURDEN PERFORMANCE MONITORING WELL LOCATION
INJ-1	OVERBURDEN INJECTION WELL LOCATION
MW-5B	BEDROCK MONITORING WELL LOCATION
PMW-9	BEDROCK PERFORMANCE MONITORING WELL LOCATION
INJ-3	BEDROCK INJECTION WELL LOCATION

SOURCE: INTERA, 2006

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

60 40 20 0 60

SCALE IN FEET

N

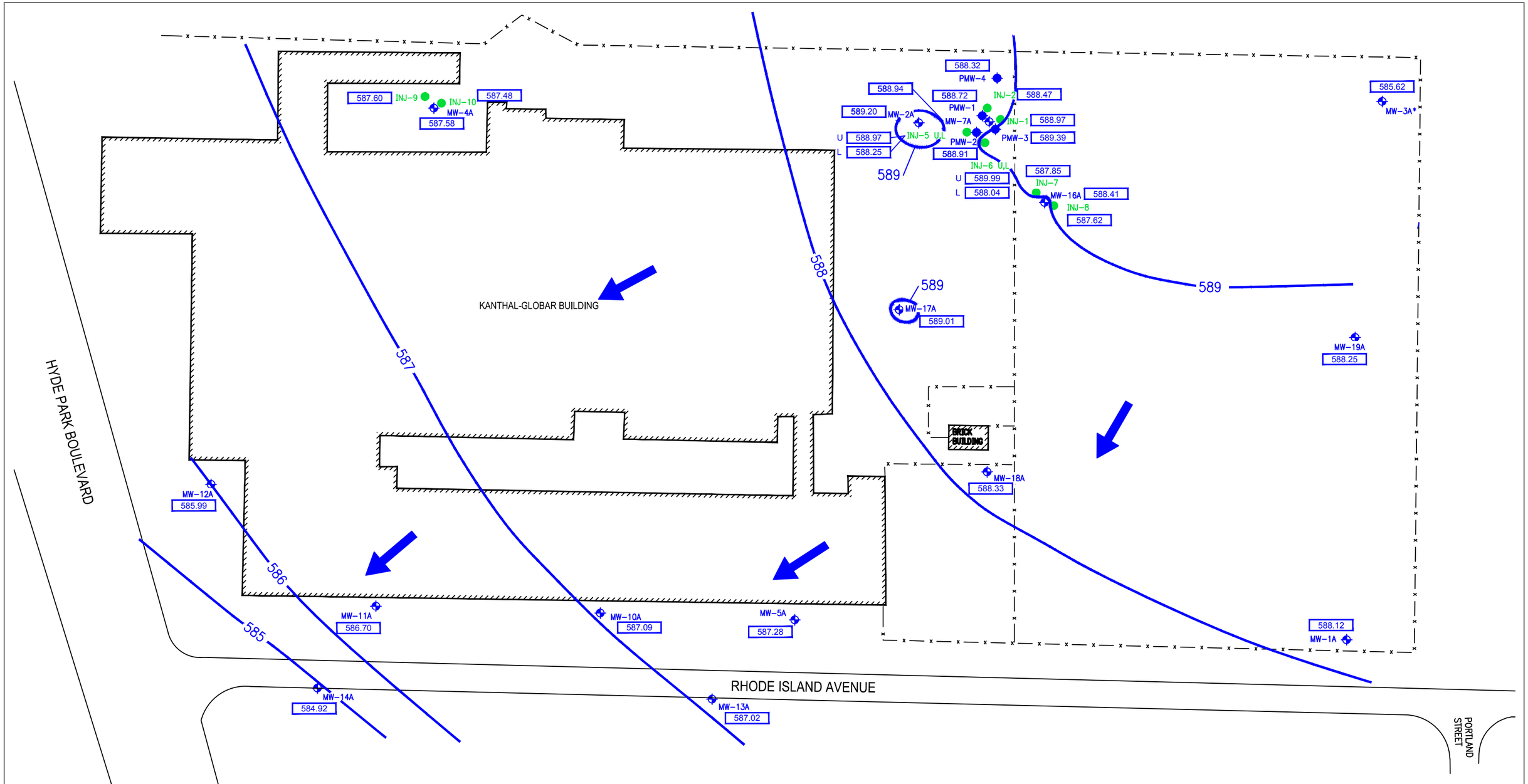
FIGURE 1.2

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK

SITE PLAN

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

\\nybuf03fs01\pctgprojects\Hyde Park\446849\graphics\CAD\Hyde_CAD(link)_updated May 2014.dwg 11/12/13



NOTE:
* MW-3A DOES NOT APPEAR TO REPRESENT THE OVERBURDEN GROUNDWATER AND WAS NOT USED IN CONTOURING.

LEGEND:

- PROPERTY LINE
- FENCE
- MW-5A — OVERBURDEN MONITORING WELL LOCATION
- PMW-1 — OVERBURDEN PERFORMANCE MONITORING WELL LOCATION
- INJ-1 — OVERBURDEN INJECTION WELL LOCATION
- MH-1 — MANHOLE (SANITARY SEWER SAMPLE LOCATION)
- 587.02 — GROUNDWATER ELEVATION (FT-AMSL)
- 587 — EQUIPOTENTIAL CONTOUR LINE (1.0 FT. CONTOUR INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

BASEMAP SOURCE: INTERA, 2006

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

60 40 20 0 60
SCALE IN FEET

N

FIGURE 4.1

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK

OVERBURDEN GROUNDWATER ELEVATIONS NOVEMBER 16, 2015

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

\\nybuf03fs01\pctgprojects\Hyde Park\449503\graphics\CAD\Hyde_CAD(link)_updated January 2016.dwg

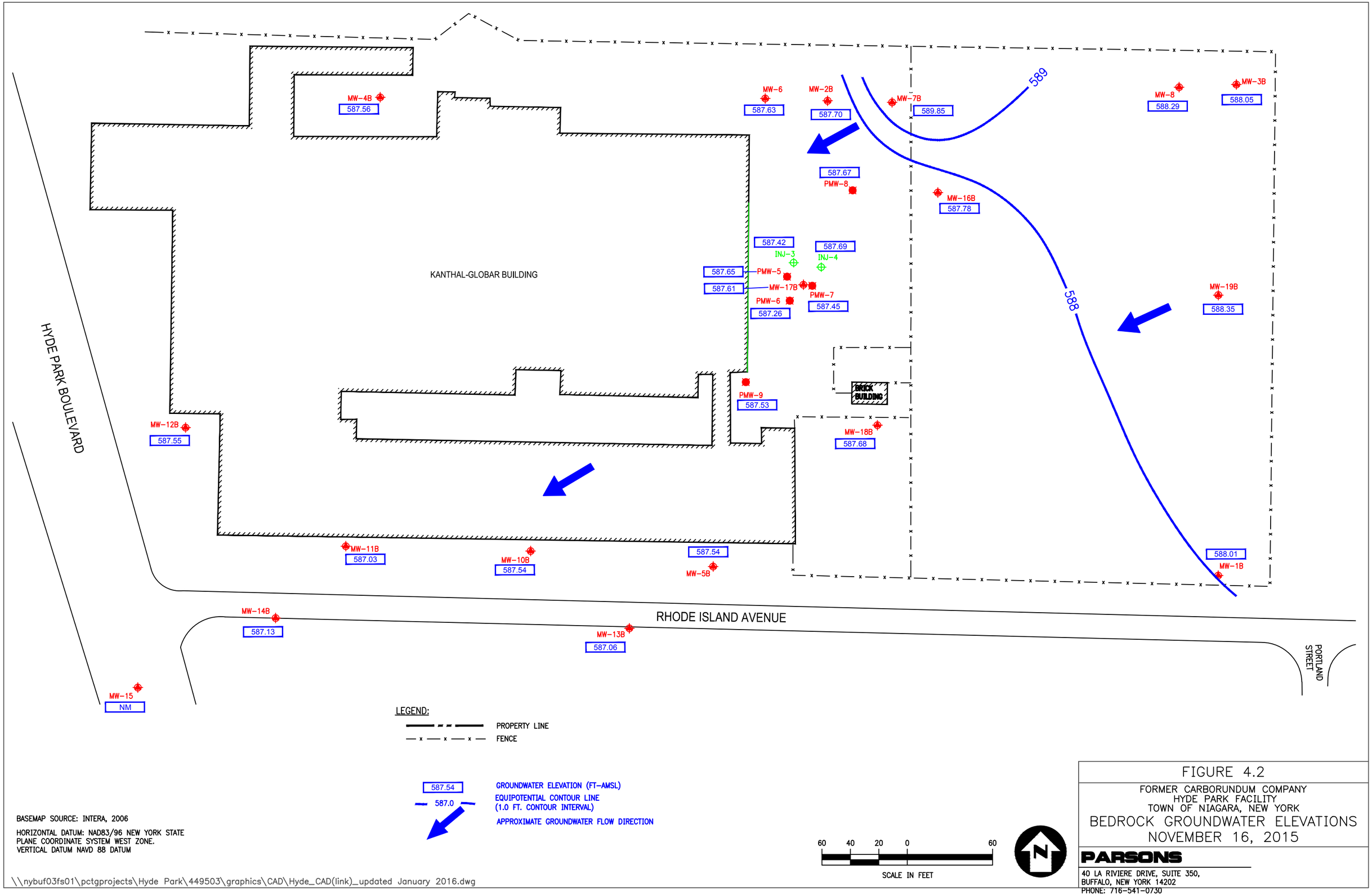


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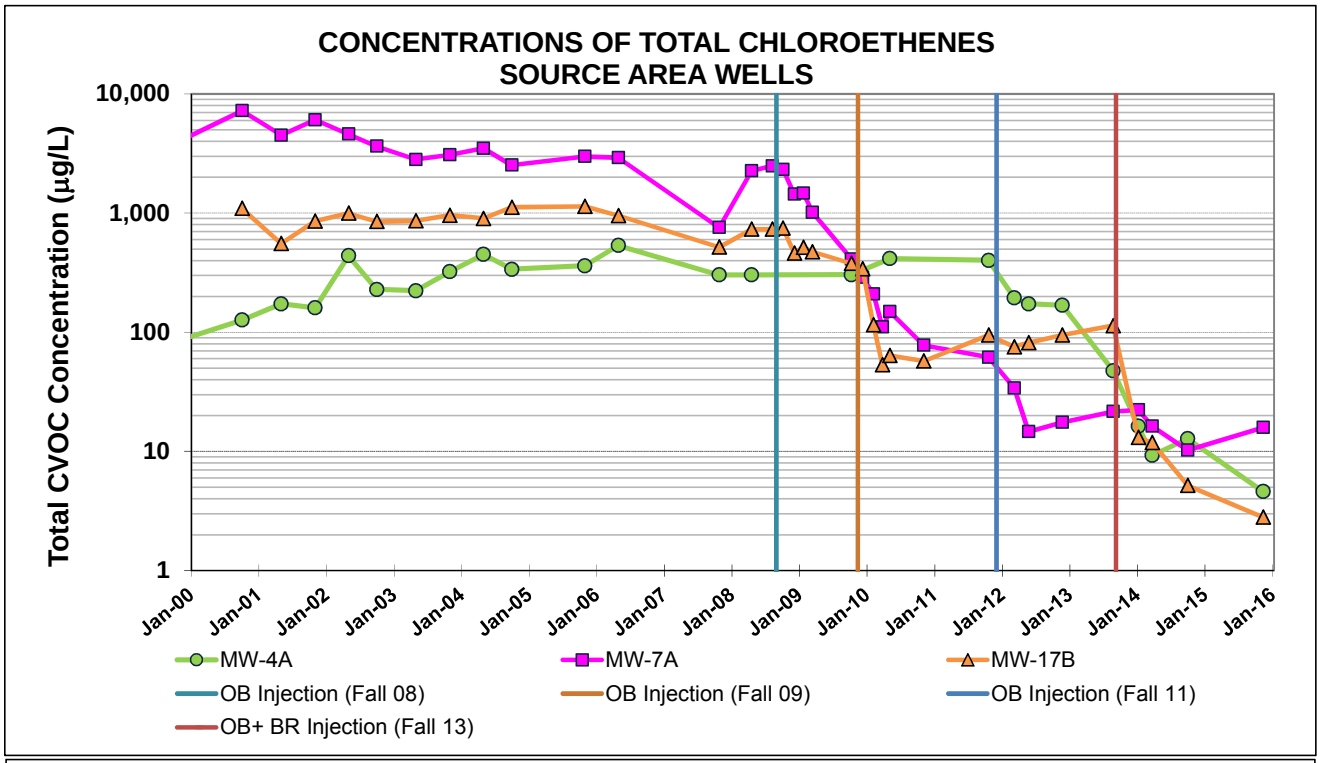
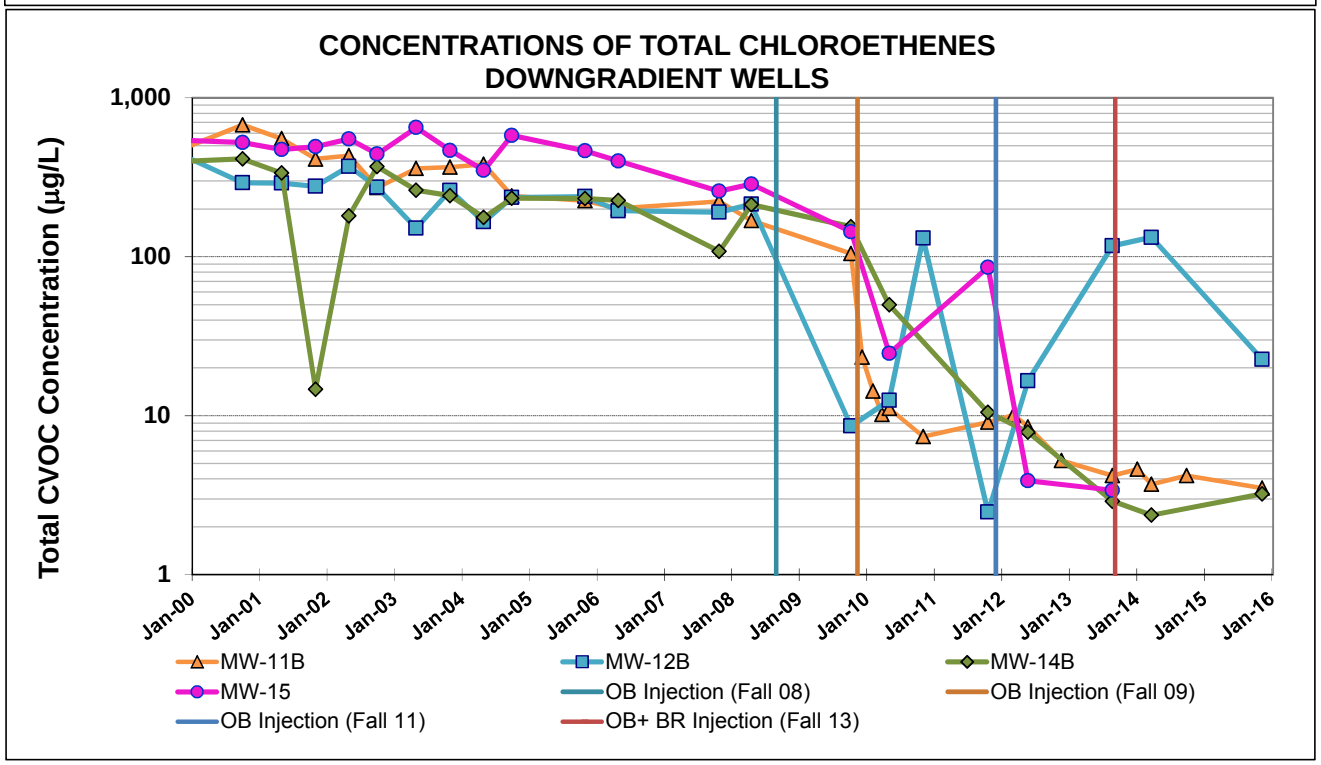
FIGURE 4.2

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK

BEDROCK GROUNDWATER ELEVATIONS
NOVEMBER 16, 2015

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





Note:
Total CVOC Concentration is the sum of TCE, cis-1,2-DCE, VC, and DCA concentrations.

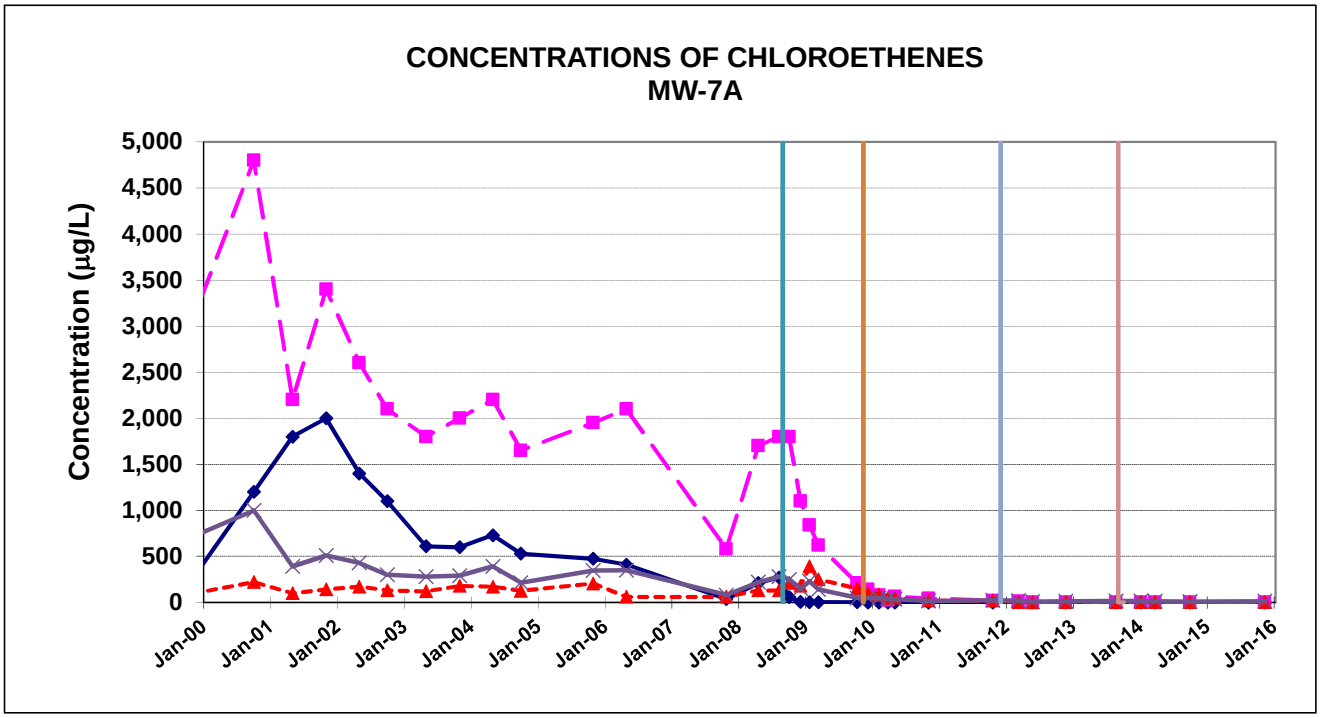
FIGURE 4.3

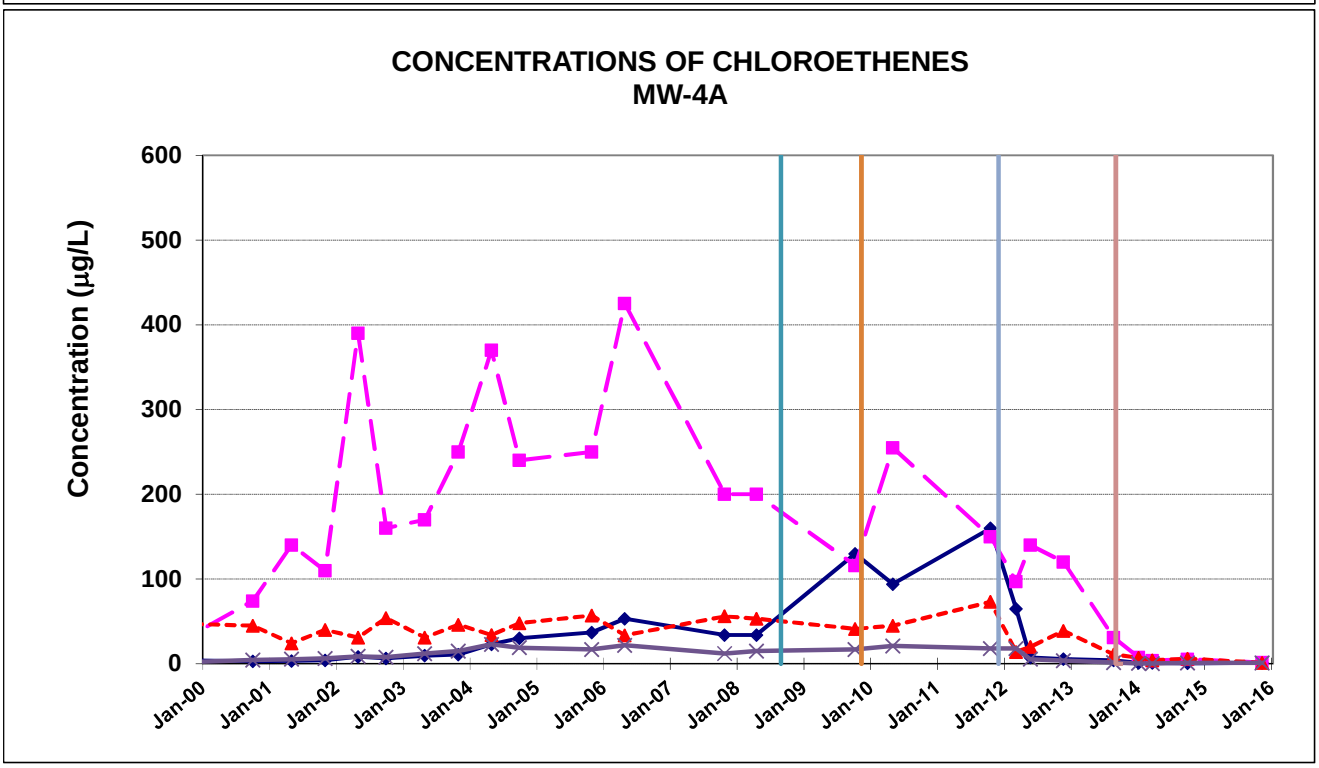
FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF TOTAL CHLORINATED ETHENES IN SOURCE AREA AND DOWNGRADIENT WELLS

PARSONS

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





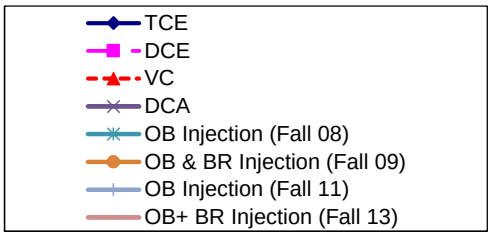


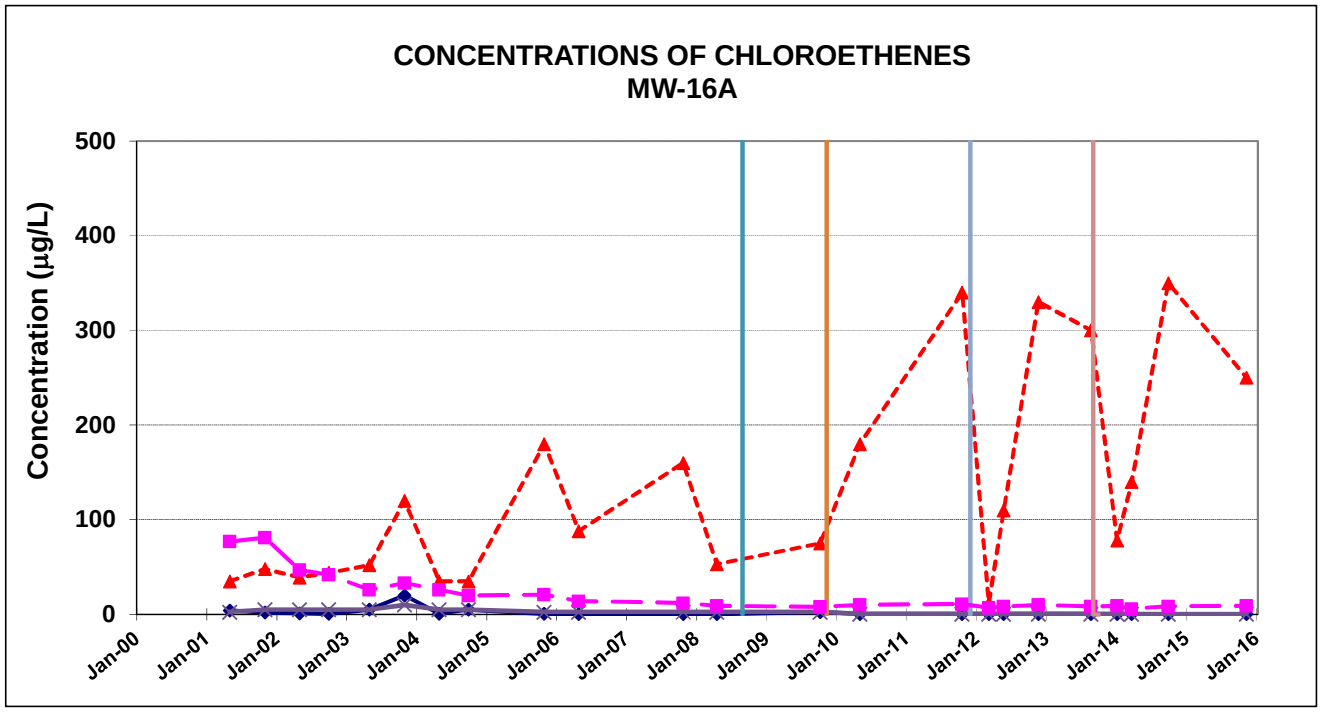
FIGURE 4.4

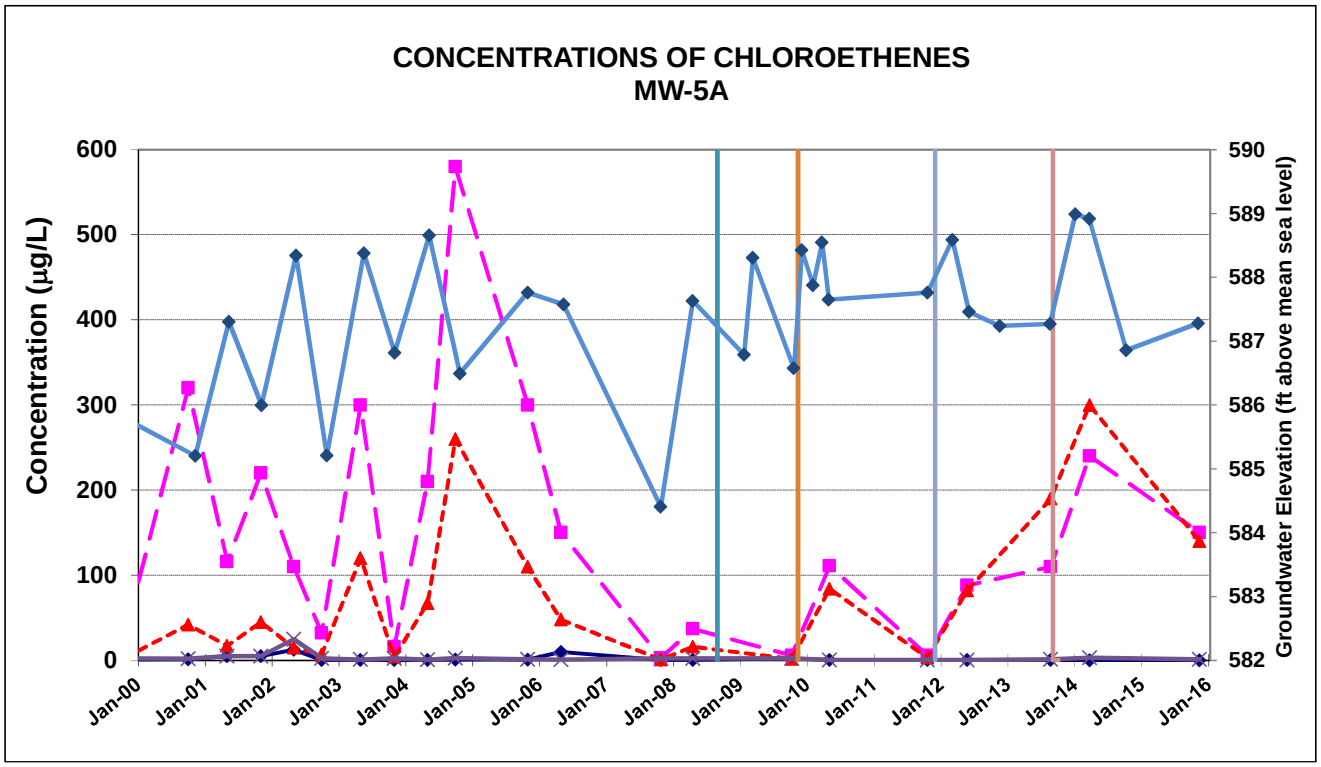
FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-7A AND MW-4A

PARSONS

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





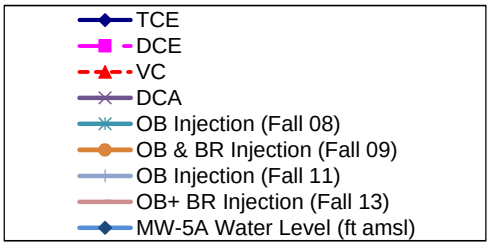


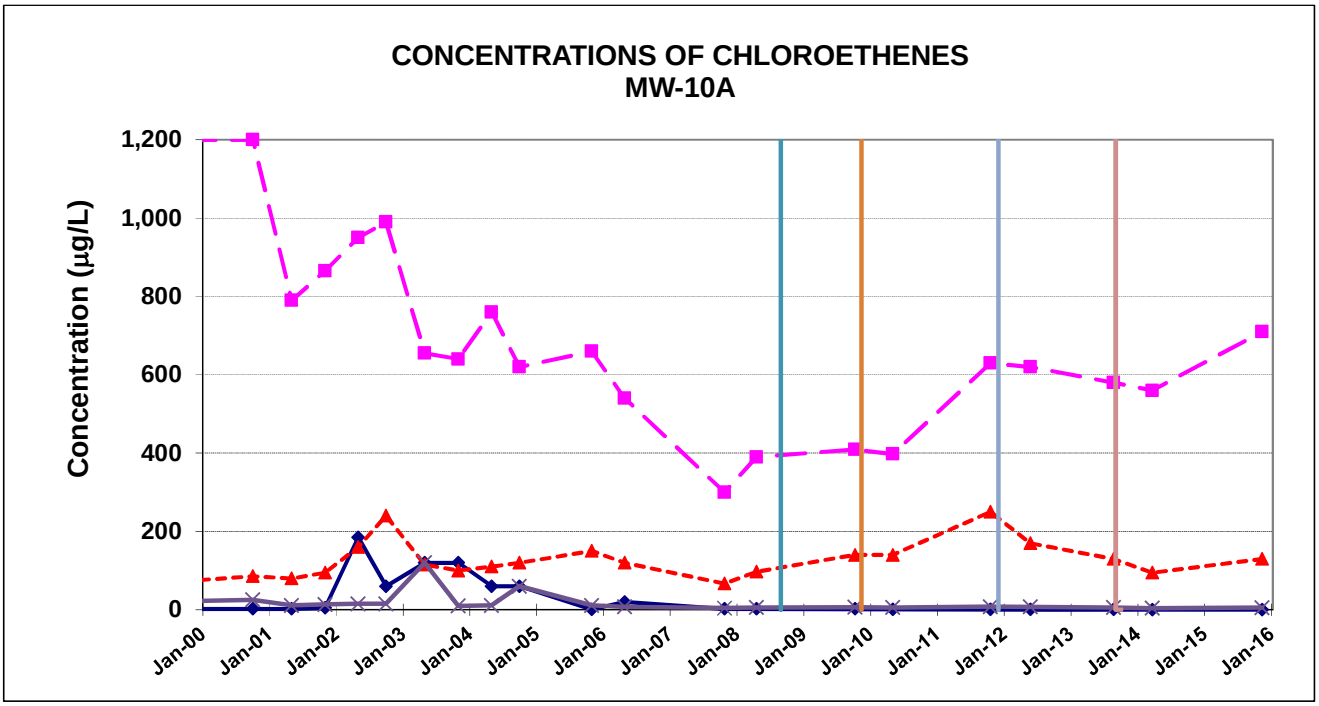
FIGURE 4.5

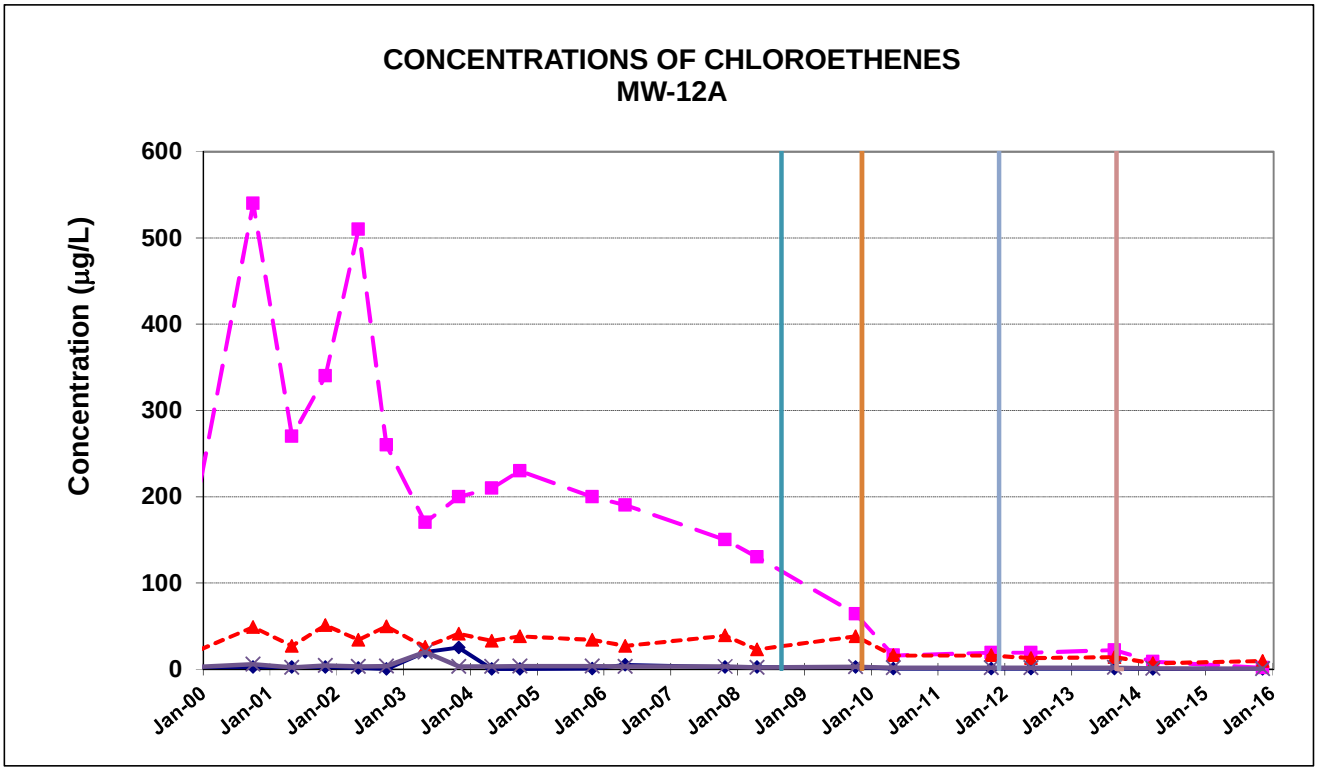
FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-16A AND MW-5A

PARSONS

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





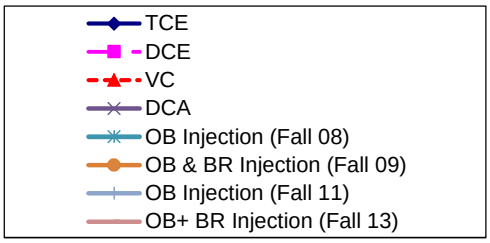


FIGURE 4.6

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-10A AND MW-12A

PARSONS

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

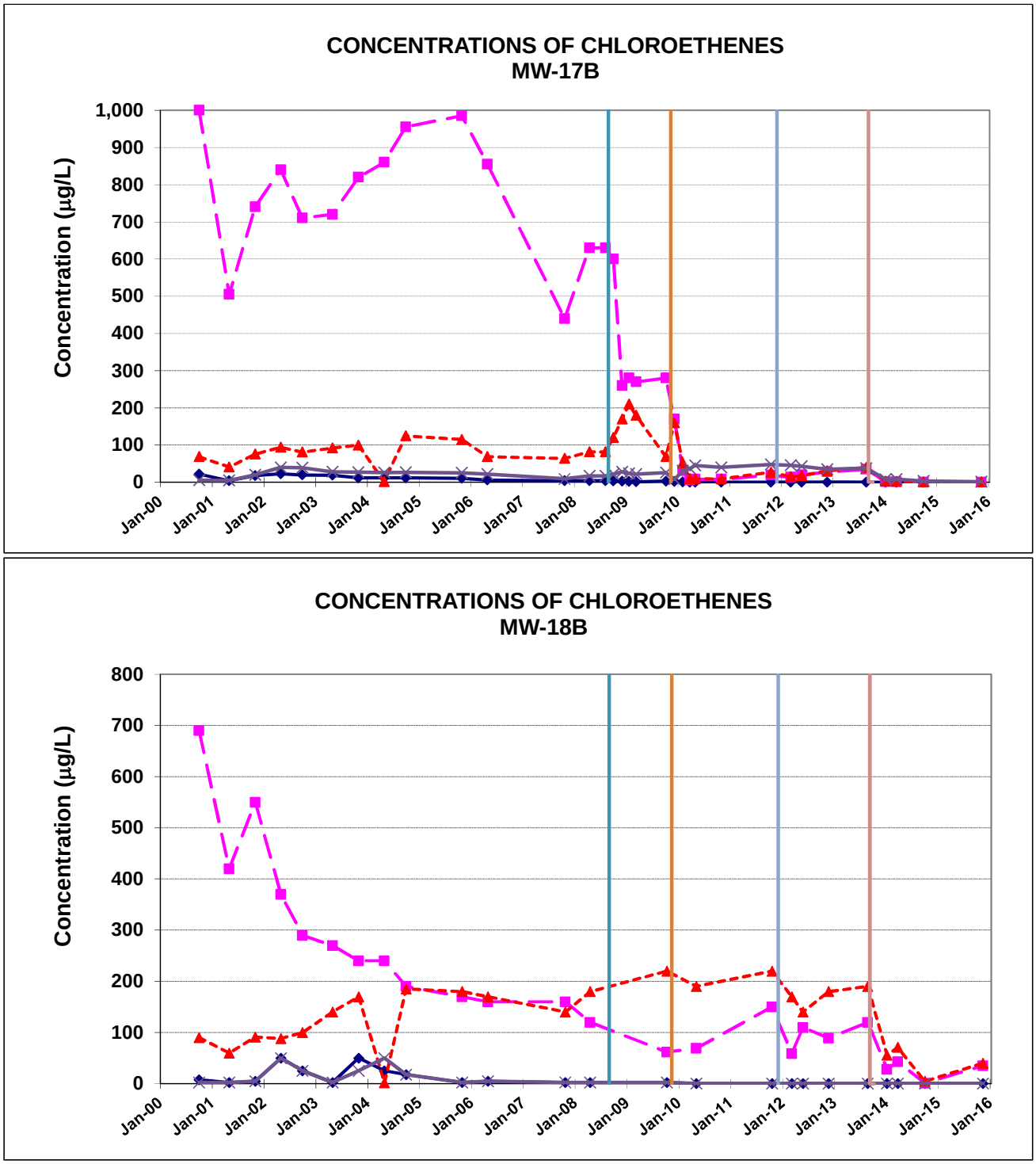


FIGURE 4.7

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-17B AND MW-18B

PARSONS

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

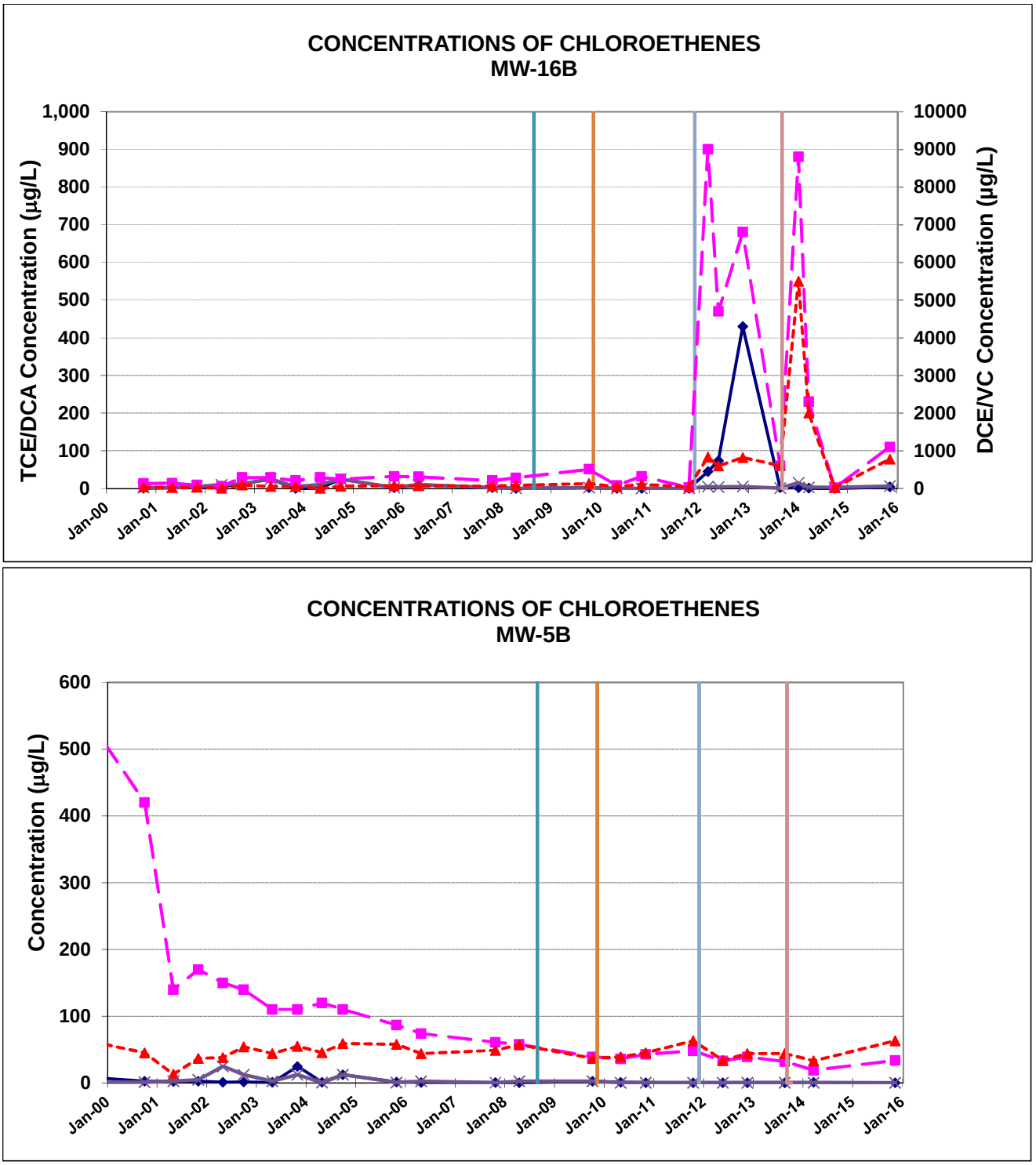


FIGURE 4.8

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-16B AND MW-5B

PARSONS

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

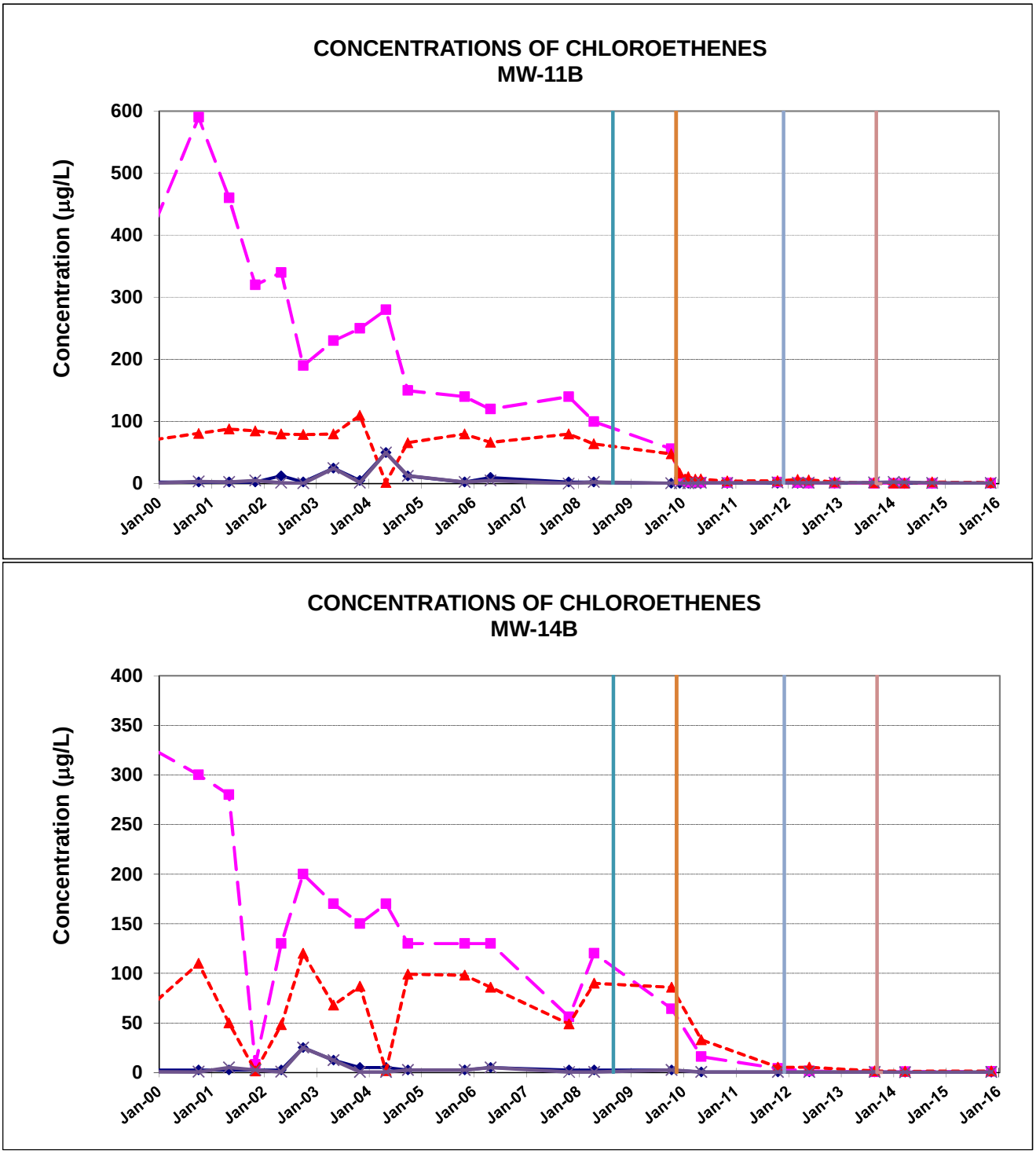


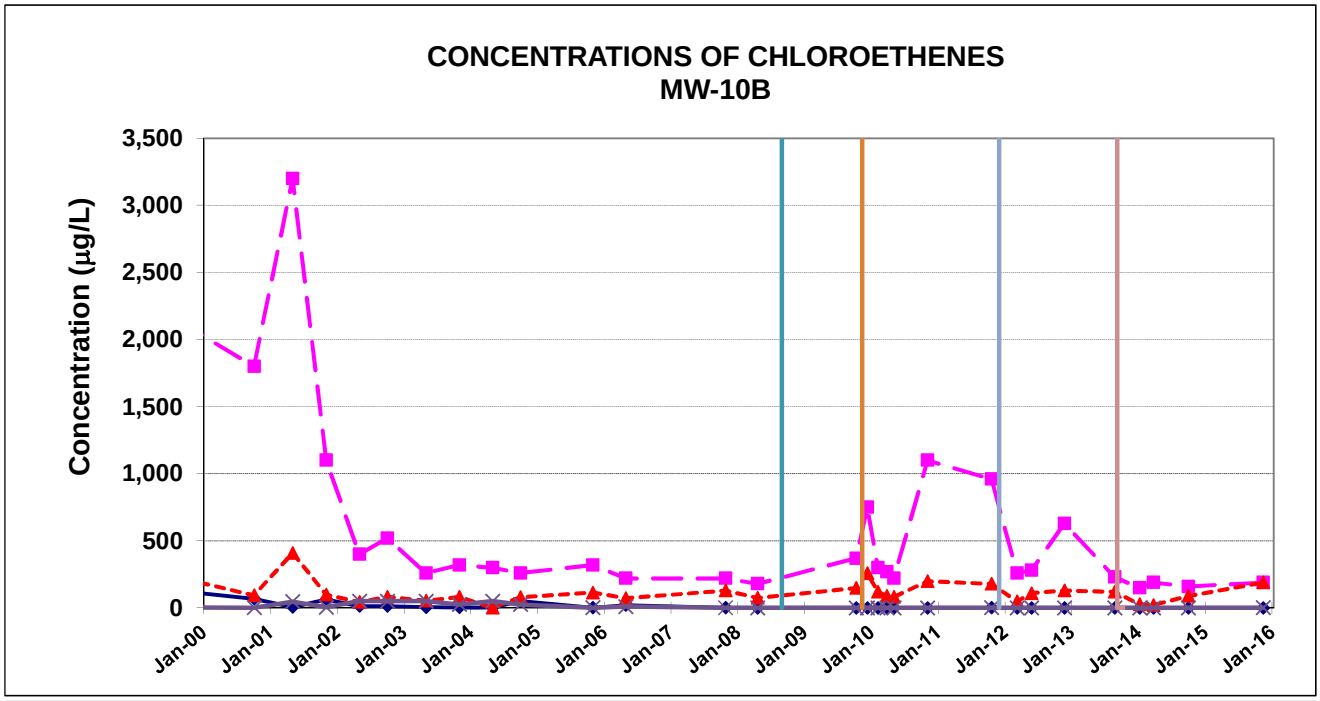
FIGURE 4.9

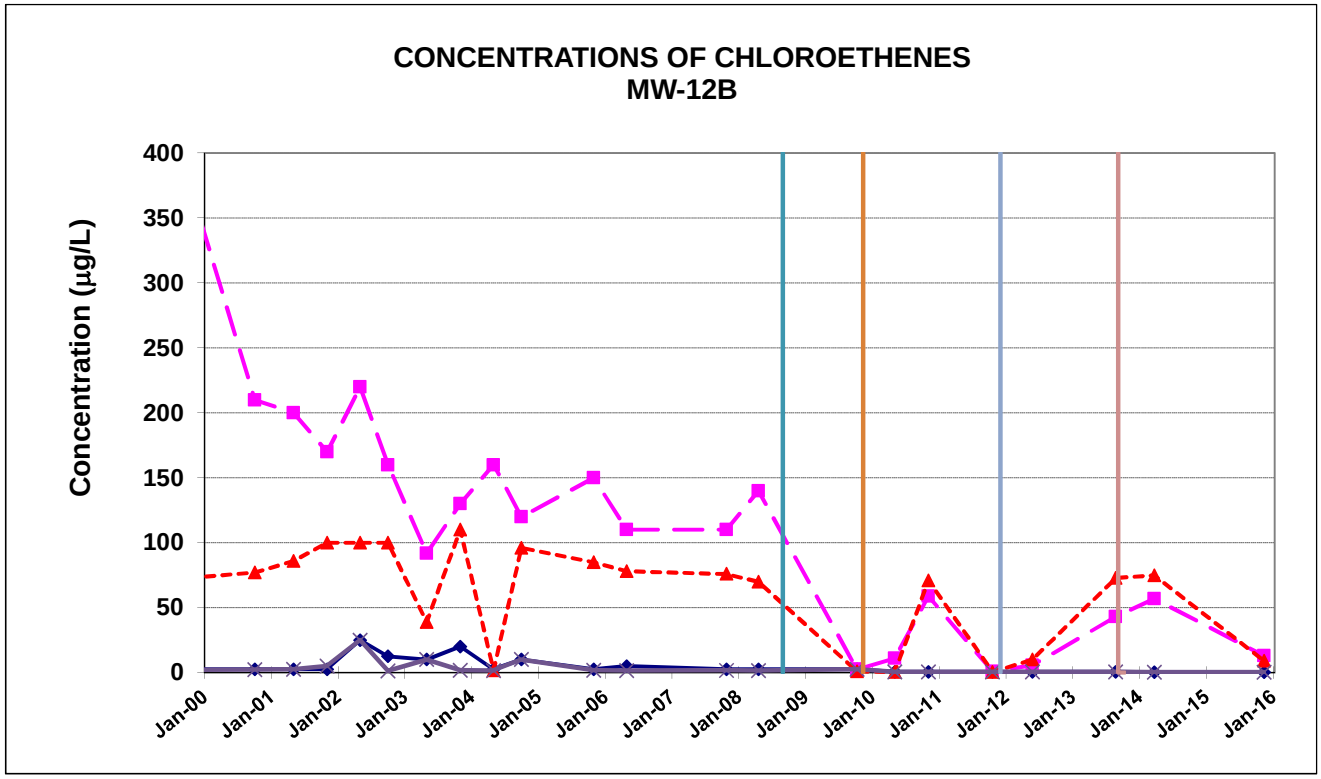
FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-11B AND MW-14B

PARSONS

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





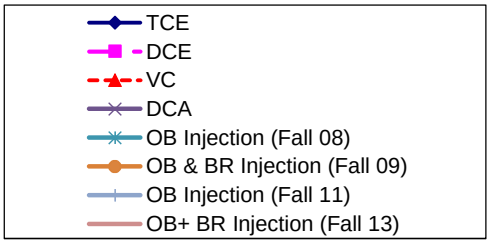


FIGURE 4.10

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-10B AND MW-12B

PARSONS

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

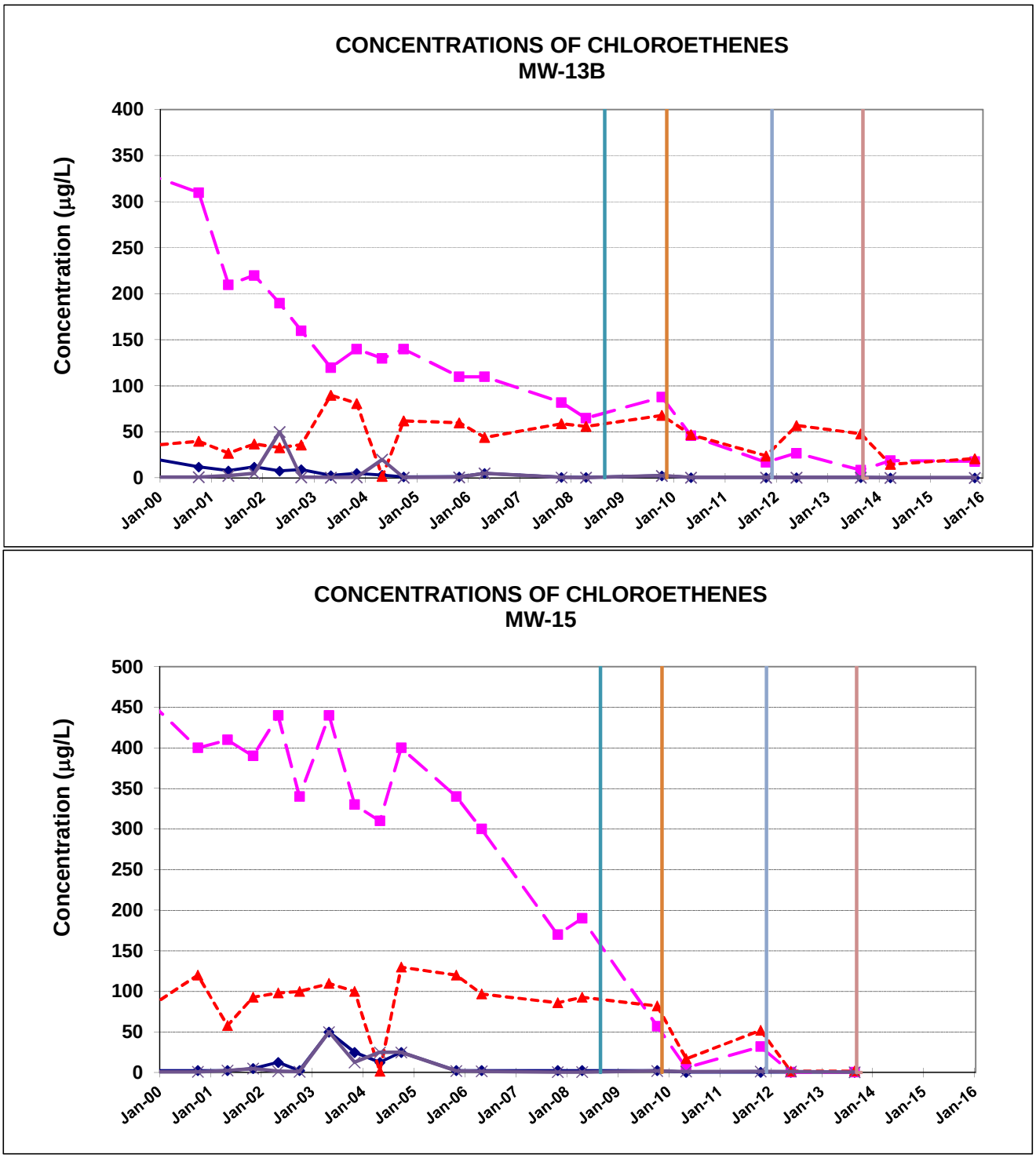


FIGURE 4.11

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-13B AND MW-15

PARSONS

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

MW-4A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	2.8 J	130	94	160	7.5	4.2 J	1.2	1.2
DCE	74	115.7	254.9	150	140	31	3.7	1.3
VC	45	41	45	73	20	11	4.1	1.1
DCA	4.6 J	17	21	18	5.4	1.3 J	0.5 U	1

MW-7A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	1200	1.8 J	1 U	1 U	1.2 J	1 U	0.5 U	0.5 U
DCE	4800	210	65	20	3.8 J	3.9 J	3	1.5
VC	220	150	50	19	1 U	2.2 J	1	3.1
DCA	1000	49	33	22	9.1	15	12	11

MW-3A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	0.43 J	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	1.5 J	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	2 U	2 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

MW-2A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	1.2 J	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A
VC	2 U	1.3 J	1.2 J	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	13 J	26	18	#N/A	#N/A	#N/A	#N/A	#N/A

MW-17A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	115	22	15	11	5.3	3.1 J	0.62 J	0.5 U
DCE	230	180	210	160	140	180	150	160
VC	18	25	27	30	25	45	49	86
DCA	59	30	20	26	21	22	16	18

MW-16A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	#N/A	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	#N/A	8.2	10	11	8.4	8.5	5.9	9.1
VC	#N/A	75	180	340	110	300	140	250
DCA	#N/A	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-12A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	2.6 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	540	64	16	19	19	22	8.9	1.6
VC	49	38	16	16	13	14	6.8	9.6
DCA	5.9	2.7	1.6 J	1.8 J	1.8 J	1.9 J	0.89 J	0.7 J

MW-18A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	36	25	25	23	21	25	27	38
DCE	47	43	51	42	56	58	43	53
VC	4.4	7	2.6 J	8.4	2.4 J	3.4 J	0.86 J	2.3
DCA	5.6	4.7 J	4.2 J	4.7 J	4.2 J	4.9 J	3.6	4.7

MW-19A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	1.7 J	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	33	3.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	2 U	2.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

MW-11A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	1.3 J	5 U	1.9 J	#N/A	#N/A	#N/A	#N/A	#N/A
VC	2 U	2 U	3.2 J	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 U	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A

MW-10A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	1200	409.4	397.6	630	620	580	560	710
VC	86	140	140	250	170	130	95	130
DCA	25	6.4	5.7	7.7	7	5.6	4.4	5.3

MW-5A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	1.3 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	320	5.9	110.97	5.7	88	110	240	150
VC	42	1.8	84	3.3 J	82	190	300	140
DCA	2.1 J	5 U	1 U	1 U	1 U	1.3 J	3.3	1.4

MW-1A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	2.4 J	1 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	0.44 J	1 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 UJ	1 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

MW-14A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	1.6 J	1.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	0.37 J	2.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

MW-13A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	2 U	2 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

INJ-9
INJ-10
MW-4A
MW-2A
INJ-5 U,L
PMW-4
INJ-2
PMW-1
MW-7A
INJ-1
PMW-2
PMW-3
INJ-6 U,L
MW-3A
INJ-7
MW-16A
INJ-8
MW-17A
KANTHAL-GLOBAR BUILDING
MW-19A
MW-12A
BUILDING
MW-18A
HYDE PARK BOULEVARD
MW-11A
MW-10A
MW-5A
MW-1A
MW-14A
MW-13A
RHODE ISLAND AVENUE
PORTLAND STREET

LEGEND:

- PROPERTY LINE
- FENCE
- PMW-2 — OVERBURDEN PERFORMANCE MONITORING WELL LOCATION
- MW-5A — OVERBURDEN MONITORING WELL LOCATION
- INJ-1 — OVERBURDEN INJECTION WELL LOCATION
- #N/A — NOT SAMPLED

CONCENTRATIONS IN ug/L (ppb)

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

SOURCE: INTERA, 2006

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

60 40 20 0 60
SCALE IN FEET

\\nybuf03fs01\pctgprojects\Hyde Park\449503\graphics\CAD\Hyde_CAD(link)_updated January 2016.dwg

FIGURE 4.12

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK

VOC CONCENTRATIONS IN OVERBURDEN GROUNDWATER (2000–2015)

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

MW-6	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	560	85	39	33	30	24	18	20
VC	91	69	48	57	47	42	39	57
DCA	0.28 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-7B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	84	7.3	4.5 J	6	1.6 J	1.2 J	0.5 U	1.2
VC	39	24	31	25	9.2	7.5	5.5	6.1
DCA	5 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-3B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	4.8 J	1.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	2.3	2.9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	5 U	5 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

MW-4B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	3.2 J	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	39	9.7	2.8	#N/A	#N/A	#N/A	#N/A	#N/A
VC	35	9.5	12	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	3.2 J	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A

MW-2B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	0.44 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	260	9.1	3.7 J	1.8 J	2.7 J	2.3 J	1	0.87 J
VC	92	16	7.6 J	2.6 J	8.6	4 J	2.2	3.4
DCA	5 UJ	5 U	1 U	1 U	1 U	1 U	0.92 J	0.65 J

MW-8	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	5.55	2.1	2.3	1.9 J	1.6 J	1.7 J	1.6	1.7
VC	1.9 J	2.6	2.2	2.1 J	1.1 J	1.8 J	1.5	1.9
DCA	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-17B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	22	3.1 J	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	1000	280	8.5	19	20	35	1.3	0.5 U
VC	69	69	9.6	27	18	40	2.1	0.8 J
DCA	5.4	26	45	48	43	38	8.2	1.5

KANTHAL-GLOBAR BUILDING

MW-16B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	0.97 J	5 U	1 U	1 U	74	2.2 J	2.5 U	4.8
DCE	130	511.8	81	27	4700	600	2300	1100
VC	35	130	48	43	600	610	2000	780
DCA	5 U	5 U	1 U	1 U	4 J	1 J	3.4 J	6.6

MW-19B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	2.4 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	41	68	2.1	8.7	2.3 J	2.1 J	2.9	1.8
VC	6.3	7.2	2.1 J	3.3 J	1.6 J	1.2 J	0.65 J	1
DCA	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-12B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	210	2.6	11	0.98 J	5.6	43	57	13
VC	77	2 U	1 U	1 U	10	73	75	9.1
DCA	2.3 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-18B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	7.7	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	690	62	69	150	110	120	43	35
VC	90	220	190	220	140	190	71	40
DCA	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-11B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	590	56	1.9 J	2.2 J	1 U	0.8 U	0.5 U	0.56 J
VC	81	48	7.4	4.6 J	6.1	1.4 J	1.2	1.7
DCA	3.5 J	1 U	1.3 J	1.8 J	1.4 J	1.9 J	2	1

MW-10B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	68	1 U	1 U	2 U	1 U	1 U	0.5 U	0.5 U
DCE	1800	370	220	960	280	230	190	190
VC	95	150	83	180	110	120	22	190
DCA	1.2 J	1 U	1 U	2 U	1 U	1 U	0.5 U	0.9 J

MW-1B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	1 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCE	4.7 J	0.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
VC	3.8	1.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DCA	1.5 J	1 U	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

MW-14B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	300	64	16	4.1 J	1.5 J	0.8 U	0.67 J	0.95 J
VC	110	86	33	5.4	5.4	1.5 J	1.2	1.5
DCA	0.61 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.53 J

MW-15	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	5 U	5 U	1 U	1 U	1 U	1 U	#N/A	#N/A
DCE	400	57.1	5.9	32	0.8 U	0.8 U	#N/A	#N/A
VC	120	82	17	52	1.8 J	2 J	#N/A	#N/A
DCA	0.95 J	2	1.3 J	1.4 J	1.2 J	1 U	#N/A	#N/A

MW-13B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	12	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U
DCE	310	88	46	17	27	8.6	19	18
VC	40	68	47	24	57	48	15	21
DCA	0.91 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-5B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15
TCE	2.6 J	5 U	1.1 J	1 U	1 U	1 U	0.97 J	0.58 J
DCE	420	39	36	48	33	32	19	34
VC	45	37	39	63	34	44	33	63
DCA	1.1 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U

MW-6 MW-4B MW-2B MW-7B MW-3B MW-8 MW-16B MW-19B MW-17B MW-12B MW-11B MW-10B MW-18B MW-1B MW-14B MW-13B MW-15 MW-5B

PMW-5 PMW-6 PMW-7 PMW-8 PMW-9

INJ-3 INJ-4

BRICK BUILDING

HYDE PARK BOULEVARD

RHODE ISLAND AVENUE

PORTLAND STREET

LEGEND:

- PROPERTY LINE
- FENCE
- PMW-9 — BEDROCK PERFORMANCE MONITORING WELL LOCATION
- MW-5B — BEDROCK MONITORING WELL LOCATION
- INJ-3 — BEDROCK INJECTION WELL LOCATION
- #N/A — NOT SAMPLED

CONCENTRATIONS IN ug/L (ppb)

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

SOURCE: INTERA, 2006

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

60 40 20 0 60

SCALE IN FEET

\\nybuf03fs01\pctgprojects\Hyde Park\449503\graphics\CAD\Hyde_CAD(link)_updated January 2016.dwg

FIGURE 4.13

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK

VOC CONCENTRATIONS IN BEDROCK GROUNDWATER (2000–2015)

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

TABLES

Table 3.1
Summary of Groundwater Sampling
Fall 2015 Monitoring Event
Former Carborundum Company, Hyde Park Facility

Well ID	Date Sampled	Sample ID	Volume Purged (gallons)
MW-2B	20-Nov-15	MW-2B, MS, MSD	2.60
MW-4A	18-Nov-15	MW-4A	2.40
MW-5A	11/17/2015 and 11/20/2015 (BOD only)	MW-5A	3.00, 2.40
MW-5B	17-Nov-15	MW-5B, MW-50B	2.90
MW-6	20-Nov-15	MW-6B	2.60
MW-7A	19-Nov-15	MW-7A	3.00
MW-7B	23-Nov-15	MW-7B	2.60
MW-8	23-Nov-15	MW-8B	4.00
MW-10A	18-Nov-15	MW-10A	2.40
MW-10B	16-Nov-15	MW-10B	2.90
MW-11B	17-Nov-15	MW-11B	2.50
MW-12A	17-Nov-15	MW-12A	1.50
MW-12B	16-Nov-15	MW-12B	2.75
MW-13B	17-Nov-15	MW-13B	2.25
MW-14B	18-Nov-15	MW-14B	2.80
MW-15			
MW-16A	20-Nov-15	MW-16A	2.50
MW-16B	20-Nov-15	MW-16B	3.00
MW-17A	18-Nov-15	MW-17A	2.10
MW-17B	18-Nov-15	MW-17B	2.20
MW-18A	18-Nov-15	MW-18A, MW-180A	3.60
MW-18B	18-Nov-15	MW-18B	2.40
MW-19B	17-Nov-15	MW-19B, MS, MSD	3.20

Note: MW-15 is to be sampled every 5 years in accordance with NYSDEC approval on April 8, 2014, and is to be sampled next in 2018.

Table 3.2
Summary of Analytical Specifications
Fall 2015 Monitoring Event
Former Carborundum Company, Hyde Park Facility

Sample Type	Container Type	Sample Volume	Preservation Method	Max. Holding Time	Analytical Method
Chemicals of Concern (COCs)					
VOCs	40mL glass vial with septum top	3x40 mL	Hydrochloric acid, Cool 4^{o}C	14 days	SW846 Method 8260B
Natural Attenuation Parameters					
Methane, Ethene, Ethane, Propane	40mL glass vial with septum top	2x40 mL	Hydrochloric acid, Cool 4^{o}C	14 days	USEPA RSK175
TOC	40mL amber glass vial with septum top	2x40 mL	Phosphoric acid, Cool 4^{o}C	28 days	USEPA 5310C
BOD	500 mL plastic	500 mL	None	48 hrs	USEPA 5120B
COD	120 mL amber glass	120 mL	Sulfuric acid	28 days	USEPA 410.4
Dissolved Iron	250 mL plastic	250 mL	Nitric acid	6 months	USEPA 6010C
Chloride	40mL glass vial with septum top	2x40 mL	None	28 days	USEPA 300.1
Nitrate	40mL glass vial with septum top	1x40 mL	Sulfuric acid	28 days	USEPA 353.2
Nitrite	40mL glass vial with septum top	1x40 mL	None	48 hours	USEPA 354.1
Sulfate	40mL glass vial with septum top	2x40 mL	None	28 days	USEPA 300.1
Sulfide	250 mL glass	250 mL	Sodium hydroxide and zinc acetate	7 days	Standard Method 204500

TABLE 4.1
WATER LEVEL MEASUREMENTS
(NOVEMBER 2015)

Well ID	Elevation TOC	Easting	Northing	11/16/2015	
				Water Level	GW Elevation
PMW-1	596.62	1028372.30	1136886.30	7.90	588.72
PMW-2	595.98	1028371.76	1136875.49	7.07	588.91
PMW-3	596.59	1028379.73	1136882.30	7.20	589.39
PMW-4	597.05	1028384.66	1136909.84	8.73	588.32
PMW-5	592.65	1028308.62	1136764.72	5.00	587.65
PMW-6	592.44	1028310.46	1136747.77	5.18	587.26
PMW-7	592.93	1028325.51	1136758.05	5.48	587.45
PMW-8	593.11	1028352.65	1136824.51	5.44	587.67
PMW-9	592.45	1028282.58	1136689.24	4.92	587.53
INJ-1	596.66	1028382.45	1136887.25	7.69	588.97
INJ-2	595.89	1028374.60	1136890.69	7.42	588.47
INJ-3	592.87	1028313.28	1136774.48	5.45	587.42
INJ-4	593.26	1028332.65	1136771.29	5.57	587.69
INJ-5U	596.08	1028365.66	1136878.92	7.11	588.97
INJ-5L	596.00	1028365.66	1136878.92	7.75	588.25
INJ-6U	596.96	1028376.98	1136868.99	6.97	589.99
INJ-6L	595.97	1028376.98	1136868.99	7.93	588.04
INJ-7	592.76	1028409.44	1136837.46	4.91	587.85
INJ-8	592.98	1028418.16	1136832.59	5.36	587.62
INJ-9	591.62	1028023.50	1136898.15	4.02	587.60
INJ-10	591.49	1028032.17	1136890.90	4.01	587.48
MW-1A	597.56	1028606.44	1136554.99	9.44	588.12
MW-1B	597.64	1028611.01	1136554.66	9.54	588.10
MW-2A	595.73	1028335.27	1136881.61	6.53	589.20
MW-2B	595.80	1028337.09	1136888.34	8.10	587.70
MW-3A	599.94	1028627.22	1136895.86	14.32	585.62
MW-3B	599.70	1028624.57	1136899.80	11.65	588.05
MW-4A	591.60	1028027.77	1136890.77	4.02	587.58
MW-4B	591.49	1028023.72	1136890.65	3.93	587.56
MW-5A	597.91	1028256.93	1136567.66	10.63	587.28
MW-5B	597.79	1028256.86	1136562.36	10.25	587.54
MW-6B	595.51	1028293.24	1136889.98	7.88	587.63
MW-7A	596.59	1028379.67	1136889.32	7.65	588.94
MW-7B	596.66	1028377.01	1136884.33	6.81	589.85

TABLE 4.1
WATER LEVEL MEASUREMENTS
(NOVEMBER 2015)

Well ID	Elevation TOC	Easting	Northing	11/16/2015	
				Water Level	GW Elevation
MW-8B	599.63	1028584.29	1136897.91	11.34	588.29
MW-10A	596.87	1028134.19	1136571.96	9.78	587.09
MW-10B	596.71	1028129.79	1136571.87	9.17	587.54
MW-11A	595.48	1027992.43	1136576.28	8.78	586.70
MW-11B	595.57	1027996.44	1136575.71	8.54	587.03
MW-12A	590.79	1027887.31	1136654.88	4.80	585.99
MW-12B	590.89	1027886.62	1136658.22	3.34	587.55
MW-13A	595.18	1028202.92	1136517.75	8.16	587.02
MW-13B	594.73	1028199.59	1136517.64	7.67	587.06
MW-14A	592.97	1027954.11	1136524.76	8.05	584.92
MW-14B	592.85	1027951.17	1136524.55	5.72	587.13
MW-15B	591.44	1027851.99	1136475.97	#N/A	#N/A
MW-16A	591.64	1028415.02	1136829.41	3.23	588.41
MW-16B	592.38	1028414.66	1136826.44	4.60	587.78
MW-17A	593.13	1028319.92	1136765.00	4.12	589.01
MW-17B	592.92	1028319.47	1136763.41	5.31	587.61
MW-18A	593.78	1028377.39	1136661.13	5.45	588.33
MW-18B	593.43	1028375.07	1136659.79	5.75	587.68
MW-19A	594.95	1028610.90	1136747.48	6.70	588.25
MW-19B	594.65	1028611.64	1136749.89	6.30	588.35

Table 4.2
Sample Matrix for November 2015 Annual Sampling Event

Location		VOCs[A/] (SW8260 B)	Methane, Ethane, Ethene (RSKSOP-175mod)[B/]	Propane (RSKSOP-175mod) [B/]	Chloride, Sulfate (300.1)	Total Organic Carbon (5310C)	BOD (5120B), COD (410.4)	Dissolved Iron (6010B)	Nitrate (353.2), Nitrite (354.1)	Sulfide (SM204500)	Well Head Analysis [C/]	Field Analyses (Hach kits) [D/]
Existing Site Investigation Monitoring Wells												
MW-2B	bedrock	1									1	1
MW-4A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-5A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-5B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-6	bedrock	1									1	1
MW-7A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-7B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-8	bedrock	1									1	1
MW-10A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-10B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-11B	bedrock	1								1	1	1
MW-12A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-12B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-13B	bedrock	1									1	1
MW-14B	bedrock	1									1	1
MW-16A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-16B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-17A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-17B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-18A	overburden	1	1	1	1	1	1	1	1	1	1	1
MW-18B	bedrock	1	1	1	1	1	1	1	1	1	1	1
MW-19B	bedrock	1									1	1
QA/QC												
MS/MSDs and field duplicates will be collected at the rate of 1 per 20 samples.												
Name duplicates blind, using a similar scheme but a non-existent well, such as MW-190B or MW-60.												

Notes:

* - MW-15 to be sampled every 5 years as approved by DEC in April 2014. Next sample event is in 2018.
Requires permit from City of Niagara Falls- City Administrator (716-286-4320).

[A/] VOCs: PCE, TCE, cis and trans 1,2-DCE, 1,1-DCE, 1,1-DCA, 1,1,1-TCA, VC, and chloroethane.

[B/] Analytical method for dissolved gases will be a laboratory-specific standard operating procedure (RSK-175).

[C/] Well head analyses include dissolved oxygen, oxidation-reduction potential, pH, temperature, electrical conductivity, turbidity and visual appearance.

[D/] Field analyses include carbon dioxide, alkalinity, hydrogen sulfide, and ferrous iron.

Table 4.3
Field Measured Parameters
Fall 2015 Monitoring Event
Former Carborundum Company, Hyde Park Facility

Well ID	Sample Date	pH (pH Units)	Conductivity (mS/cm)	Temperature (^{o}C)	Eh (mV)	DO^{+} (mg/L)	Turbidity (NTU)	Alkalinity (g/g)	Carbon Dioxide (mg/L)	Ferrous Iron (mg/L)	Hydrogen Sulfide (mg/L)
MW-2B	20-Nov-15	5.93	1.820	13.33	-312	7.25	0.0	600.0	370.0	0.2	5.0
MW-4A	18-Nov-15	6.33	1.920	15.93	-67	2.87	91.00	1,000.0	460.0	1.8	0.0
MW-5A	17-Nov-15	7.49	0.668	16.00	60	0.00	13.8	103.0	56.5	0.2	0.0
MW-5B	17-Nov-15	6.99	1.180	14.01	-44	0.00	1.30	140.0	86.0	0.8	0.6
MW-6	20-Nov-15	6.58	1.220	12.37	-257	7.67	0.00	105.0	162.0	0.0	0.2
MW-7A	19-Nov-15	6.69	1.970	14.76	-67	0.53	13.8	297.5	350.0	2.8	0.1
MW-7B	23-Nov-15	6.67	1.490	12.40	-329	9.17	44.4	87.5	186.0	0.0	5.0
MW-8	23-Nov-15	6.82	1.270	11.86	-239	4.27	0.00	105.0	160.0	0.0	2.0
MW-10A	18-Nov-15	7.04	0.966	15.39	-86	0.00	14.7	70.0	60.0	1.8	0.1
MW-10B	16-Nov-15	7.17	1.220	15.31	-107	0.00	1.00	340.0	105.2	0.0	0.2
MW-11B	17-Nov-15	7.09	1.180	15.36	-253	4.72	0.62	300.0	220.0	0.0	5.0
MW-12A	17-Nov-15	7.07	0.666	14.83	-92	3.24	3.14	100.0	114.0	2.0	0.0
MW-12B	16-Nov-15	6.97	0.462	14.62	226	4.70	1.32	260.0	127.8	0.2	0.0
MW-13B	17-Nov-15	7.29	1.660	14.61	-11	3.39	3.81	220.0	66.8	0.2	0.0
MW-14B	18-Nov-15	7.18	0.518	14.38	-241	5.73	5.1	70.0	54.0	0.2	0.7
MW-15	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-16A*	20-Nov-15	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*175.0*	*250.0*	*0.2*	*0.0*
MW-16B	20-Nov-15	5.77	1.610	11.88	-320	9.03	0.00	640.0	574.0	0.4	5.0
MW-17A	18-Nov-15	6.89	1.160	15.71	-90	3.08	11.0	460.0	184.0	1.4	0.0
MW-17B	18-Nov-15	6.05	2.200	15.97	-146	3.09	35.4	840.0	754.0	2.1	0.2
MW-18A	18-Nov-15	7.07	0.425	16.46	-106	0.80	1.0	87.5	67.0	1.6	0.0
MW-18B	18-Nov-15	6.14	0.610	15.65	-90	0.00	20.9	157.5	234.0	3.4	1.0
MW-19B	17-Nov-15	6.98	0.938	14.46	-133	3.37	1.29	260.0	102.6	0.0	4.0

* Well ran dry and field data was not collected.

$^{+}$ Elevated dissolved oxygen readings in some cases conflict with negative oxidation/reduction potential readings.

NM - Not measured. MW-15 is to be sampled every 5 years in accordance with NYSDEC approval on April 8, 2014, and is to be sampled next in 2018.

TABLE 4.4
ANALYTICAL SUMMARY TABLE
2015 ANNUAL SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility Annual Report		NYSDEC Ambient Water Quality Standards/Guidance Criteria (1)		Overburden Wells			
			Location ID:	MW-4A	MW-5A	MW-7A	MW-10A
			Sample ID:	MW-4A_2015-11-18	MW-5A_2015-11-17/20	MW-7A_2015-11-19	MW-10A_2015-11-18
			Lab Sample Id:	8141874	8139304/8145519	8143667	8141879
			Source:	LANCASTERLABS	LANCASTERLABS	LANCASTERLABS	LANCASTERLABS
			SDG:	BPX57	BPX56/59	BPX58	BPX57
			Matrix:	WATER	WATER	WATER	WATER
			Sampled:	11/18/2015	11/17-20/2015	11/19/2015	11/18/2015
			Validated:	1/11/2016	1/11/2016	1/11/2016	1/11/2016
CAS NO.	COMPOUND		UNITS:				
	VOLATILES						
71-55-6	1,1,1-TRICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	5	ug/l	1	1.4	11	5.3
75-35-4	1,1-DICHLOROETHENE	5	ug/l	0.5 U	0.5 U	0.5 U	0.52 J
75-00-3	CHLOROETHANE	5	ug/l	3	1.5	4.8	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	5	ug/l	1.3	150	1.5	710
127-18-4	TETRACHLOROETHYLENE(PCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	5	ug/l	0.5 U	1.6	0.5 U	9.1
79-01-6	TRICHLOROETHYLENE (TCE)	5	ug/l	1.2	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	2	ug/l	1.1	140	3.1	130
74-85-1	ETHENE	--	ug/l	18	39	1.1 J	17
74-84-0	ETHANE	--	ug/l	5.2	5.4	2.8 J	1 U
74-82-8	METHANE	--	ug/l	17000	2000	5900	220
74-98-6	PROPANE	--	ug/l	1 U	1 U	1 U	1 U
	DISSOLVED METALS						
7439-89-6	IRON	300	mg/l	14.5	0.0333 U	7.85	1.81
	WET CHEM						
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	--	mg/l	70.6	6 U	99.3	2.9 U
18496-25-8	SULFIDE	0.05	mg/l	0.085 J	0.054 U	0.22	0.054 U
TOC	TOTAL ORGANIC CARBON	--	mg/l	36.6	0.5 U	84.3	0.87 J
16887-00-6	CHLORIDE (AS CL)	250	mg/l	123	102	24.6	434
COD	COD - CHEMICAL OXYGEN DEMAND	--	mg/l	443	12.8 U	293 J-	22.1 J
14797-55-8	NITROGEN, NITRATE (AS N)	10	mg/l	0.04 U	0.61	0.04 U	0.04 U
14797-65-0	NITROGEN, NITRITE	1	mg/l	0.015 U	0.015 U	0.015 U	0.015 U
14808-79-8	SULFATE (AS SO4)	250	mg/l	5.6	102	20.2	170

Notes:
(1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998).
(2) -- indicates no standard or guidance value available.
(3) U indicates compound was not detected at specified detection limit.
(4) J indicates an estimated concentration. J+ is estimated biased high, and J- is estimated biased low.
(5) Shaded values indicate concentrations above groundwater standard or guidance values.

TABLE 4.4
ANALYTICAL SUMMARY TABLE
2015 ANNUAL SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility Annual Report		NYSDEC Ambient Water Quality Standards/Guidance Criteria (1)	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	Overburden Wells MW-12A MW-12A_2015-11-17 8139305 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	 MW-16A MW-16A_2015-11-20 8145520 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016	 MW-17A MW-17A_2015-11-18 8141872 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	 MW-18A MW-18A_2015-11-18 8141876 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016
CAS NO.	COMPOUND		UNITS:				
	VOLATILES						
71-55-6	1,1,1-TRICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	5	ug/l	0.7 J	0.5 U	18	4.5
75-35-4	1,1-DICHLOROETHENE	5	ug/l	0.5 U	0.5 U	0.5 U	1.1
75-00-3	CHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	5	ug/l	1.6	9.1	160	51
127-18-4	TETRACHLOROETHYLENE(PCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	5	ug/l	0.5 U	0.5 U	0.5 U	0.73 J
79-01-6	TRICHLOROETHYLENE (TCE)	5	ug/l	0.5 U	0.5 U	0.5 U	38
75-01-4	VINYL CHLORIDE	2	ug/l	9.6	250	86	2.3
74-85-1	ETHENE	--	ug/l	1 U	95	11	1 U
74-84-0	ETHANE	--	ug/l	1 U	1.2 J	12	1 U
74-82-8	METHANE	--	ug/l	140	49	15000	11 J
74-98-6	PROPANE	--	ug/l	1 U	1 U	1 U	1 U
	DISSOLVED METALS						
7439-89-6	IRON	300	mg/l	2.27	0.0333 U	1.45	1.5
	WET CHEM						
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	--	mg/l	3.8 U	5.2 U	7.3	2.8 U
18496-25-8	SULFIDE	0.05	mg/l	0.079 J	0.054 U	0.054 U	0.054 U
TOC	TOTAL ORGANIC CARBON	--	mg/l	7.7	6.5	3	1.2
16887-00-6	CHLORIDE (AS CL)	250	mg/l	63.6	290	167	113
COD	COD - CHEMICAL OXYGEN DEMAND	--	mg/l	26.7 J	33.6 J	15.2 J	12.8 U
14797-55-8	NITROGEN, NITRATE (AS N)	10	mg/l	0.04 U	0.04 U	0.04 U	0.04 U
14797-65-0	NITROGEN, NITRITE	1	mg/l	0.015 U	0.015 U	0.015 U	0.015 U
14808-79-8	SULFATE (AS SO4)	250	mg/l	119	1080	114	118

Notes:
(1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998).
(2) -- indicates no standard or guidance value available.
(3) U indicates compound was not detected at specified detection limit.
(4) J indicates an estimated concentration. J+ is estimated biased high, and J- is estimated biased low.
(5) Shaded values indicate concentrations above groundwater standard or guidance values.

TABLE 4.4
ANALYTICAL SUMMARY TABLE
2015 ANNUAL SAMPLING EVENT

				Overburden	Bedrock Wells		
				Dup of MW-18A_2015-11-18			Dup of MW-5B_2015-11-17
Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility Annual Report		NYSDEC Ambient Water Quality Standards/Guidance Criteria (1)	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-18A MW-180A_2015-11-18 8141878 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-2B MW-2B_2015-11-20 8145515 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016	MW-5B MW-5B_2015-11-17 8139301 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	MW-5B MW-50B_2015-11-17 8139302 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016
CAS NO.	COMPOUND		UNITS:				
	VOLATILES						
71-55-6	1,1,1-TRICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	5	ug/l	4.7	0.65 J	0.5 U	0.5 U
75-35-4	1,1-DICHLOROETHENE	5	ug/l	1.2	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	5	ug/l	53	0.87 J	34	33
127-18-4	TETRACHLOROETHYLENE(PCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	5	ug/l	0.76 J	0.56 J	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	5	ug/l	39	0.5 U	0.58 J	0.6 J
75-01-4	VINYL CHLORIDE	2	ug/l	2.8	3.4	65	63
74-85-1	ETHENE	--	ug/l	1 U		2.3 J	2.4 J
74-84-0	ETHANE	--	ug/l	1 U		1 U	1 U
74-82-8	METHANE	--	ug/l	20 J		120	120
74-98-6	PROPANE	--	ug/l	1 U		1 U	1 U
	DISSOLVED METALS						
7439-89-6	IRON	300	mg/l	1.47		0.502	0.497
	WET CHEM						
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	--	mg/l	2.9 U		5.1 U	4.8 U
18496-25-8	SULFIDE	0.05	mg/l	0.054 U		0.054 U	0.054 U
TOC	TOTAL ORGANIC CARBON	--	mg/l	1.3		3.1	3.1
16887-00-6	CHLORIDE (AS CL)	250	mg/l	111		117	118
COD	COD - CHEMICAL OXYGEN DEMAND	--	mg/l	12.8 U		17.5 J	15.2 J
14797-55-8	NITROGEN, NITRATE (AS N)	10	mg/l	0.04 U		0.04 U	0.04 U
14797-65-0	NITROGEN, NITRITE	1	mg/l	0.015 U		0.015 U	0.015 U
14808-79-8	SULFATE (AS SO4)	250	mg/l	120		251	254

Notes:
(1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998).
(2) -- indicates no standard or guidance value available.
(3) U indicates compound was not detected at specified detection limit.
(4) J indicates an estimated concentration. J+ is estimated biased high, and J- is estimated biased low.
(5) Shaded values indicate concentrations above groundwater standard or guidance values.

TABLE 4.4
ANALYTICAL SUMMARY TABLE
2015 ANNUAL SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility Annual Report		NYSDEC Ambient Water Quality Standards/Guidance Criteria (1)	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	**Bedrock Wells** MW-6 MW-6_2015-11-20 8145518 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016	MW-7B MW-7B_2015-11-23 8148046 LANCASTERLABS BPX60 WATER 11/23/2015 1/11/2016	MW-8 MW-8_2015-11-23 8148045 LANCASTERLABS BPX60 WATER 11/23/2015 1/11/2016	MW-10B MW-10B_2015-11-16 8136961 LANCASTERLABS BPX55 WATER 11/16/2015 1/11/2016
CAS NO.	COMPOUND		UNITS:				
	VOLATILES						
71-55-6	1,1,1-TRICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.9 J
75-35-4	1,1-DICHLOROETHENE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	5	ug/l	20	1.2	1.7	190
127-18-4	TETRACHLOROETHYLENE(PCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	5	ug/l	0.5 U	0.5 U	0.5 U	0.68 J
79-01-6	TRICHLOROETHYLENE (TCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	2	ug/l	57	6.1	1.9	190
74-85-1	ETHENE	--	ug/l		4.3 J		190
74-84-0	ETHANE	--	ug/l		1 U		2.1 J
74-82-8	METHANE	--	ug/l		11000		2900
74-98-6	PROPANE	--	ug/l		1 U		1.5 J
	DISSOLVED METALS						
7439-89-6	IRON	300	mg/l		0.0333 U		0.0333 U
	WET CHEM						
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	--	mg/l		22.2		6 U
18496-25-8	SULFIDE	0.05	mg/l		20.4		0.71
TOC	TOTAL ORGANIC CARBON	--	mg/l		10.8		3
16887-00-6	CHLORIDE (AS CL)	250	mg/l		189		145
COD	COD - CHEMICAL OXYGEN DEMAND	--	mg/l		97.8		17.5 J
14797-55-8	NITROGEN, NITRATE (AS N)	10	mg/l		0.04 U		0.04 U
14797-65-0	NITROGEN, NITRITE	1	mg/l		0.015 U		0.015 U
14808-79-8	SULFATE (AS SO4)	250	mg/l		146		207

Notes:
(1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998).
(2) -- indicates no standard or guidance value available.
(3) U indicates compound was not detected at specified detection limit.
(4) J indicates an estimated concentration. J+ is estimated biased high, and J- is estimated biased low.
(5) Shaded values indicate concentrations above groundwater standard or guidance values.

TABLE 4.4
ANALYTICAL SUMMARY TABLE
2015 ANNUAL SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility Annual Report		NYSDEC Ambient Water Quality Standards/Guidance Criteria (1)	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	**Bedrock Wells** MW-11B MW-11B_2015-11-17 8139306 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	MW-12B MW-12B_2015-11-16 8136960 LANCASTERLABS BPX55 WATER 11/16/2015 1/11/2016	MW-13B MW-13B_2015-11-17 8139303 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	MW-14B MW-14B_2015-11-18 8141875 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016
CAS NO.	COMPOUND		UNITS:				
	VOLATILES						
71-55-6	1,1,1-TRICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	5	ug/l	1	0.5 U	0.5 U	0.53 J
75-35-4	1,1-DICHLOROETHENE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	5	ug/l	0.56 J	13	18	0.95 J
127-18-4	TETRACHLOROETHYLENE(PCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	5	ug/l	0.57 J	0.5 U	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	2	ug/l	1.7	9.1	21	1.5
74-85-1	ETHENE	--	ug/l		1 U		
74-84-0	ETHANE	--	ug/l		1 U		
74-82-8	METHANE	--	ug/l		25		
74-98-6	PROPANE	--	ug/l		1 U		
	DISSOLVED METALS						
7439-89-6	IRON	300	mg/l		0.111 J		
	WET CHEM						
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	--	mg/l		4.7 U		
18496-25-8	SULFIDE	0.05	mg/l		0.054 U		
TOC	TOTAL ORGANIC CARBON	--	mg/l		9.2		
16887-00-6	CHLORIDE (AS CL)	250	mg/l		148		
COD	COD - CHEMICAL OXYGEN DEMAND	--	mg/l		22.1 J		
14797-55-8	NITROGEN, NITRATE (AS N)	10	mg/l		0.2 J+		
14797-65-0	NITROGEN, NITRITE	1	mg/l		0.039 J		
14808-79-8	SULFATE (AS SO4)	250	mg/l		244		

Notes:
(1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998).
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(3) U indicates compound was not detected at specified detection limit.
(4) J indicates an estimated concentration. J+ is estimated biased high, and J- is estimated biased low.
(5) Shaded values indicate concentrations above groundwater standard or guidance values.

TABLE 4.4
ANALYTICAL SUMMARY TABLE
2015 ANNUAL SAMPLING EVENT

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility Annual Report		NYSDEC Ambient Water Quality Standards/Guidance Criteria (1)		Bedrock Wells			
			Location ID:	MW-16B	MW-17B	MW-18B	MW-19B
			Sample ID:	MW-16B_2015-11-20	MW-17B_2015-11-18	MW-18B_2015-11-18	MW-19B_2015-11-17
			Lab Sample Id:	8145514	8141873	8141877	8139298
			Source:	LANCASTERLABS	LANCASTERLABS	LANCASTERLABS	LANCASTERLABS
			SDG:	BPX59	BPX57	BPX57	BPX56
			Matrix:	WATER	WATER	WATER	WATER
			Sampled:	11/20/2015	11/18/2015	11/18/2015	11/17/2015
			Validated:	1/11/2016	1/11/2016	1/11/2016	1/11/2016
CAS NO.	COMPOUND		UNITS:				
	VOLATILES						
71-55-6	1,1,1-TRICHLOROETHANE	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	5	ug/l	6.6	1.5	0.5 U	0.5 U
75-35-4	1,1-DICHLOROETHENE	5	ug/l	2.2	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	5	ug/l	0.5 U	7.9	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	5	ug/l	1100	0.5 U	35	1.8
127-18-4	TETRACHLOROETHYLENE(PCE)	5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	5	ug/l	22	0.5 U	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	5	ug/l	4.8	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	2	ug/l	780	0.8 J	40	1
74-85-1	ETHENE	--	ug/l	920	8.9	15	
74-84-0	ETHANE	--	ug/l	40	8.5	3.5 J	
74-82-8	METHANE	--	ug/l	24000	14000	18000	
74-98-6	PROPANE	--	ug/l	1 U	1 U	1 U	
	DISSOLVED METALS						
7439-89-6	IRON	300	mg/l	0.0333 U	13.4	2.54	
	WET CHEM						
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	--	mg/l	105	17.6	35.7	
18496-25-8	SULFIDE	0.05	mg/l	36.5	1.4	1.5	
TOC	TOTAL ORGANIC CARBON	--	mg/l	47.3	18.8	41.5	
16887-00-6	CHLORIDE (AS CL)	250	mg/l	70.6	374	62.2	
COD	COD - CHEMICAL OXYGEN DEMAND	--	mg/l	215	102	167	
14797-55-8	NITROGEN, NITRATE (AS N)	10	mg/l	0.04 U	0.04 U	0.04 U	
14797-65-0	NITROGEN, NITRITE	1	mg/l	0.015 UJ	0.015 U	0.015 U	
14808-79-8	SULFATE (AS SO4)	250	mg/l	4.2	2.5 J	70.9	

Notes:
(1) NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998).
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(4) J indicates an estimated concentration. J+ is estimated biased high, and J- is estimated biased low.
(5) Shaded values indicate concentrations above groundwater standard or guidance values.

APPENDIX A
FIVE-YEAR REVIEW REPORT

APPENDIX A

FIVE-YEAR REVIEW REPORT
(2010 TO 2015)

Former Carborundum Company, Hyde Park Facility
(Site No. 932036)

Town of Niagara, Niagara County, NY

SUBMITTED TO:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

SUBMITTED BY:

Atlantic Richfield Company

A BP affiliated company

201 Helios Way
Houston, Texas 77079

PREPARED BY:

PARSONS

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

FEBRUARY 2016

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LIST OF TABLES

SECTION 1
EXECUTIVE SUMMARY

The purpose of this Five-Year Review Report is to summarize the investigation, remediation, and monitoring activities completed between 2010 and 2015 at the Former Carborundum Company Hyde Park Facility (Site) in the Town of Niagara, New York, and to determine if the goals of the remediation activities were successful.

Prior to the first bioremediation injections, declining chlorinated volatile organic compound (CVOC) concentration trends were observed. Natural biodegradation was indicated based on anaerobic groundwater conditions and the presence of trichloroethene (TCE) biodegradation products, cis- and trans- 1,2-dichloroethene (DCE) and vinyl chloride (VC) and ethene, the final non-toxic end product of TCE biodegradation. The purpose of the bioremediation injections conducted between 2008 and 2013 was to decrease CVOC concentrations by enhancing the natural biodegradation of CVOCs in groundwater. Results of the bioremediation injections conducted between 2008 and 2013, documented by multiple groundwater monitoring events, indicate that this objective has been met. Total CVOC concentrations in source area and downgradient wells have decreased by an average of approximately 1,100 µg/L and 210 µg/L, respectively, relative to pre-bioremediation concentrations. Total CVOC concentrations in November 2015 at downgradient bedrock monitoring wells MW-11B (3.51 µg/L), MW-12B (22.6 µg/L), and MW-14B (3.23 µg/L) are orders of magnitude lower relative to pre-injection concentrations in 2008 (169 µg/L in MW-11B, 214.1 µg/L in MW-12B, and 212.9 µg/L in MW-14B). Based on the extent of CVOC concentration reductions observed since enhanced natural biodegradation was initiated, additional injections are not recommended. Natural biodegradation, as indicated by the declining CVOC concentration trends, is expected to attenuate the remaining CVOCs.

SECTION 2
INTRODUCTION AND BACKGROUND

2.1 PURPOSE

This Five-Year Review Report summarizes the investigation, remediation, and monitoring activities completed between 2010 and 2015 at the Former Carborundum Company Hyde Park Facility (Site) in the Town of Niagara, New York. The last Five-Year Review Report was completed in September 2010 (Parsons, 2010). For completeness, the report also provides water level and chemical analytical data in tables and figures from 2010 through 2015.

2.2 BACKGROUND

The Site is listed on the New York State Department of Environmental Conservation (NYSDEC) list of Inactive Hazardous Waste Disposal Sites, and is currently listed as a Class 4 site (changed from Class 2 on March 26, 2013) (Site No. 932036).

The Site is a 5-acre former manufacturing facility located in the Town of Niagara at the intersection of Hyde Park Boulevard and Rhode Island Street. Residential communities are located to the south and east, with mixed industrial properties to the north. Westward, across Hyde Park Boulevard, there are mixed commercial and residential use properties.

The Carborundum Company purchased the property from the Globar Company in 1936 and manufactured heating elements and electronic components from silicon carbide. BP America purchased the Carborundum Company. The Globar facility was subsequently sold to CESIWID, Inc. in 1993. CESIWID, Inc. sold the facility to Kanthal-Globar. In 2008, the Site was sold to 3425 Hyde Park Boulevard, LLC. BP America retained the responsibility for certain pre-existing conditions when they sold the facility to CESIWID, Inc.

In 1985, the Carborundum Company installed monitoring wells and collected soil and groundwater samples to access soil and groundwater contamination. In 1987, the USEPA completed a preliminary Assessment and referred the site to the State of New York. In 1990, the NYSDEC completed a Preliminary Site Assessment (PSA). As a result of these investigations, the site remained on the Registry of Inactive Hazardous Waste Disposal Sites as a Class 2a site.

In 1993, the Carborundum Company completed a PSA. The PSA found residual (hazardous waste) contamination in Site soils and groundwater resulting from past spills and leaks from bulk chemical storage. As a result of this PSA, the Site was upgraded to a Class 2 Inactive Hazardous Waste Disposal site in the New York State registry.

Since 1993, a series of investigations have been completed to identify the extent of soil and groundwater contamination resulting from historical operations.

The Order on Consent was executed in 1995 and required a Remedial Investigation/Feasibility Study (RI/FS). The RI work began in 1995 and the RI Report was issued in January 1997. A supplemental investigation was completed and results were reported in the Phase II RI Report (Phase II RI) in May 1998. Investigation results led to a soil removal interim remedial measure (IRM), which was completed in 1999 to remove on-site soils with residual VOCs.

A Feasibility Study (FS) was completed in January 2000. In 2000, the NYSDEC completed a Record of Decision (ROD) (NYSDEC, 2000), which segmented the Site into the following three Operable Units:

- OU1 – On-site soil,
- OU2 – Groundwater beneath the Site, and
- OU3 – Off-site soil east of the Site.

Additional soil removal was conducted east of the property boundaries in 2002. Operable Units OU1 and OU3 have since been closed.

The ROD identified the need for continued groundwater monitoring with semi-annual reporting for a minimum 5-year period. Following their review of the initial 5-year groundwater monitoring summary report (Intera, 2005), the NYSDEC requested that groundwater monitoring be continued for another five years, but on an annual basis. Annual groundwater monitoring has been conducted on an alternating spring/fall schedule through November 2015, and includes the collection of groundwater samples for the chemical analysis of chlorinated VOCs and natural attenuation parameters. The key chemicals of concern (COCs) are: VC, DCE, TCE, and 1,1-dichloroethane.

The groundwater sampling targets two water bearing zones: (1) low permeability shallow soils consisting of silt and clay with lenses of sand, approximately five to 20 feet below ground surface (BGS), referred to as the overburden; and (2) fractured dolomitic bedrock (greater than 20 feet).

The remedial goals for the Site were dependent on natural attenuation. After reviewing the Five Year Review Report (Intera, 2005), NYSDEC suggested that, although natural attenuation was occurring, degradation was making slow progress towards remediation. Historical data were evaluated for remedial alternatives, and the results were submitted to the NYSDEC in a remedial alternatives report (Parsons, 2006). Application of enhanced *in situ* bioremediation was chosen as the preferred alternative for pilot testing. *In situ* bioremediation pilot tests were completed in 2008 and 2009. More detail can be found in the pilot test reports submitted to NYSDEC in July 2009 (Parsons, 2009) and August 2010 (Parsons, 2010a).

SECTION 3
REMEDIAL ACTIONS

The remedial goals were dependent on natural attenuation. After reviewing the Five Year Review Report (Intera, 2005), NYSDEC suggested that, although natural attenuation was occurring, degradation was making slow progress towards remediation.

Historical data were evaluated for remedial alternatives, and the results were submitted to the NYSDEC in a remedial alternatives report (Parsons, 2006). Application of enhanced *in situ* bioremediation technique was chosen as the preferred alternative for pilot testing. *In situ* bioremediation pilot tests in the overburden were completed in September 2008 to assess the applicability and feasibility of *in situ* bioremediation for chlorinated COCs in groundwater. The pilot tests evaluated treatment of overburden and bedrock groundwater using an organic substrate (emulsified vegetable oil mixed with Site groundwater) (biostimulation), and microorganisms (bioaugmentation) injected into groundwater to promote biodegradation of chlorinated VOCs. Terra Systems, Inc. (TSI) SRS®-SD was used for the overburden injections SRS®-FR for bedrock. In addition, TSI-DC® Bioaugmentation Culture was used for the microorganisms.

Performance groundwater monitoring was completed at approximately 4, 13, 20, and 26 weeks after substrate injection. A second phase of injections was completed in November 2009 in both the overburden and bedrock to include a modified injection solution that included ionic emulsifiers (instead of non-ionic emulsifiers) to enhance sorption of the vegetable oil to the soils. Additional groundwater performance monitoring was completed approximately 4, 13, 20, and 26 weeks after the second phase of injections.

Performance monitoring results following the pilot test injections indicated that supplemental injections in the overburden would benefit and promote further bioremediation in both the overburden and bedrock zones.

3.1 REMEDIAL ACTIONS 2010 TO 2015

In October 2011, eight injection wells were installed in the overburden (see Figure 1.2 for locations) to target the areas near PMW-2, MW-16A, and MW-14A. Wells INJ-5U and INJ-5L comprise an injection well pair that were installed within the same boring, approximately eight feet west of PMW-2. Wells INJ-6U and INJ-6L are an injection well pair installed within the same boring, approximately 10 feet southeast of PMW-2. The well pairs were installed to better target discrete injections into more permeable zones of the overburden. Additionally, single injection wells INJ-7 and INJ-8 were installed near MW-16A, and single injection wells INJ-9 and INJ-10 were installed near MW-4A.

Wells INJ-1, INJ-2, INJ-5U, INJ-5L, INJ-6U, INJ-6L, INJ-7, INJ-8, INJ-9, and INJ-10 were used during the November 2011 overburden substrate injections. The 2011 injection consisted of make-up water and TSI SRS® (proprietary vegetable-oil based substrate with emulsifiers), sodium bromide as a tracer, and sodium bicarbonate as a pH buffer.

Bioaugmentation was conducted by injecting a microbial consortium (TSI-DC®) with both *Dehalococcoides* (DHC) and *Dehalobacter* (DHB) species of bacteria. Bioaugmentation occurred at the following injection points: INJ-5U, INJ-5L, INJ-6L, INJ-2, INJ-1, INJ-9, and INJ-10.

Selected monitoring wells were sampled to assess performance at three, six, and twelve months following the November 2011 injections. Performance monitoring results following the 2011 injections indicated that supplemental injections promoted further bioremediation in both the overburden and bedrock zones (Parsons, 2012 and Parsons, 2013).

A fourth injection event was conducted in September/October 2013. Overburden wells INJ-1, INJ-2, INJ-9, INJ-10, and bedrock wells INJ-3, INJ-4, MW-16B, and MW-18B were used during the 2013 overburden and bedrock substrate injections. Bioaugmentation was again conducted during substrate injection in each of the aforementioned wells. The 2013 injection consisted of make-up water and TSI SRS® (proprietary vegetable-oil based substrate with emulsifiers) and sodium bicarbonate as a pH buffer. To assist with evaluating groundwater flow paths and velocity, dye tracers were included with the injection mixtures for bedrock injection wells MW-16B and MW-18B. A description and results of the dye tracer injection were reported in the August 2014 Six-Month Data Summary Report (Parsons, 2014a).

Following the 2013 substrate injections, selected monitoring wells were sampled to assess bioremediation at three, six, and twelve months after bioremediation. Results of the performance monitoring for the 2013 injections were reported in the May 2015 Twelve-Month Summary Report (Parsons, 2015).

Significant decreases in chlorinated volatile organic carbon (CVOC) concentrations in both the overburden and bedrock groundwater were observed, and were directly attributed to the bioremediation injections conducted in 2011 and 2013. Based on results of the bioremediation injections and the subsequent performance monitoring, the remedial objective of enhancing the natural attenuation process in groundwater was achieved. No further injections were proposed, with the annual monitoring program continuing as a means of monitoring continued progress.

3.2 GROUNDWATER MONITORING PROGRAM SUMMARY

3.2.1 Groundwater Elevations and Flow Directions

A summary of the groundwater elevations collected over the period of August 1992 through November 2015 is provided in Table 3.1. Table 3.1 also includes well elevations for the top of casing and ground surface elevations at each monitoring well.

Historically, the overburden groundwater flow direction is to the southwest, towards Hyde Park Boulevard. The overburden groundwater gradient across the Site is approximately 0.007 to 0.008 feet/foot.

Historically, the bedrock groundwater flow direction is generally west-southwest towards Hyde Park Boulevard. The bedrock groundwater gradient across the Site is approximately 0.002 to 0.003 feet/foot.

3.2.2 Groundwater Sampling

Groundwater sampling was conducted to evaluate changes and degradation of COCs over time. CVOC data and ethene production is the primary line of evidence used to demonstrate that dechlorination is occurring. Additional evidence used to demonstrate degradation includes geochemical parameters such as total organic carbon, carbon dioxide, alkalinity, hydrogen sulfide, ferrous iron, pH, ORP, and DO. Analytical data results for COCs in all "MW" wells from 2010 to 2015 are presented in the Fall 2015 Groundwater Monitoring Report.

3.3 KEY ACCOMPLISHMENTS SUMMARY

Since the last Five-Year Review report (Parsons, 2010), there have been several key accomplishments, including:

- Annual groundwater monitoring with sampling and analysis completed in compliance with the groundwater monitoring program. Results demonstrate that biodegradation is an active process and has reduced concentrations through time.

- Annual monitoring reports have been submitted to the NYSDEC from 2000 through 2014. These include summaries of the analytical results and groundwater elevation contour maps.

- Overburden injection wells INJ-5U, INJ-5L, INJ-6U, INJ-6L, INJ-7, INJ-8, INJ-9, and INJ-10 were installed and developed in October 2011.

- Additional overburden and bedrock in situ bioremediation injections were completed (in 2011 and 2013) and along with the previous injections, have demonstrated an enhanced rate of biodegradation of chlorinated solvents in groundwater. The results of these injections have been provided in various reports, including a final report submitted in May 2015.

- On March 26, 2013, the NYSDEC changed the classification of the Site from a Class 2 to a Class 4 Inactive Hazardous Waste Disposal site, with notification to the property owner (NYSDEC, 2013).

- On April 8, 2014, the NYSDEC approved a decrease in the frequency of the groundwater monitoring for MW-15 from annually to every five years (NYSDEC, 2014). MW-15 is scheduled to be sampled during the 2018 annual sampling event.

SECTION 4
CONCLUSIONS

The following conclusions were developed based on the remediation and monitoring work conducted through 2015, including the bioremediation injections:

- The requirements of the ROD (NYSDEC 2000) are being met. Measures to increase the rate of biodegradation of CVOCs through enhanced bioremediation in the overburden and bedrock have been completed and their effectiveness continues to be monitored.
- In general, there are declining or stabilizing trends in CVOC concentrations, which have developed over time. More than 15 years of groundwater monitoring have shown that natural attenuation (specifically reductive dechlorination) of chlorinated ethenes has occurred at the Site, both in the overburden and bedrock groundwater.
- The results of the four bioremediation injection events demonstrate that enhanced *in situ* bioremediation of chlorinated ethenes has been a viable treatment for groundwater.
    - Total CVOC concentrations in source area (MW-4A, MW-7A, and MW-17B) and downgradient wells (MW-11B, MW-12B, MW-14B, and MW-15B) have decreased by an average of approximately 1,100 µg/L and 210 µg/L, respectively, from pre-bioremediation in April 2008 to November 2015.
    - Bedrock groundwater CVOC concentrations generally decreased or remained stable when compared with pre-injection concentrations. Downgradient wells continued to show decreases in CVOC concentrations, with significant decreases in total CVOCs observed since the injections began in 2008. Total CVOC concentrations in November 2015 at downgradient bedrock monitoring wells MW-11B (3.51 µg/L), MW-12B (22.6 µg/L), and MW-14B (3.23 µg/L), are orders of magnitude lower relative to pre-injection concentrations in 2008 (169 µg/L in MW-11B, 214.1 µg/L in MW-12B, and 212.9 µg/L in MW-14B) (See Figure 4.3- Fall 2015 Groundwater Monitoring Report).
    - Significant declines in CVOC concentrations in the overburden and bedrock groundwater are directly attributed to the bioremediation injections conducted in 2008, 2009, 2011, and 2013.
    - Data from the performance monitoring events indicate that bioremediation in the overburden is effective, as evidenced by generally stable to decreasing concentrations of CVOCs in overburden wells in proximity to injection points. Geochemical conditions in both overburden and bedrock wells shows that the environment is suitable for continued anaerobic biodegradation.

- No further injections are recommended, based on the results of the bioremediation injections conducted between 2008 and 2013 and the corresponding performance monitoring data. The remedial objective of enhancing the natural attenuation process in groundwater has been achieved.

- Based on the success of the remediation program, and results of the monitoring, following the next annual monitoring event (spring 2015), the frequency of the monitoring events should be changed from annual to bi-annual (every other year), and the number of wells and parameter lists should be reduced. Details of the changes would be proposed following the spring 2015 annual monitoring event.

SECTION 5
REFERENCES

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Parsons, 2014a. Six-Month Data Summary Report, Former Carborundum Company (Hyde Park Facility), August 2014.

Parsons, 2015. Twelve-Month Summary Report, Former Carborundum Company (Hyde Park Facility), May 2015.

TABLE

Table 3.1
Groundwater Elevation Summary (1992-2015)
Former Carborundum Company, Hyde Park Facility

Well No.	Elevation (ft. amsl)			Static Water Level Elevation (ft. amsl)						
									2001	
	Ground Surface	Top of Monitor Well Casing	Screened Interval (O/B)	24-Aug-92	24-May-96	17-Nov-97	18-Oct-99	8-Nov-00	11-May-01	5-Nov-01
PMW-1	593.90	596.62	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-2	593.53	595.98	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-3	593.90	596.59	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-4	595.10	597.05	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-5	593.09	592.65	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-6	593.22	592.44	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-7	593.53	592.93	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-8	593.52	593.11	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-9	592.96	592.45	bedrock	nm	nm	nm	nm	nm	nm	nm
INJ-1	593.90	596.66	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-2	594.19	595.89	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-3	593.25	592.87	bedrock	nm	nm	nm	nm	nm	nm	nm
INJ-4	593.43	593.26	bedrock	nm	nm	nm	nm	nm	nm	nm
INJ-5U	593.50	596.08	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-5L	593.50	596.00	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-6U	593.40	596.96	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-6L	593.40	595.97	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-7	593.04	592.76	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-8	593.18	592.98	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-9	591.90	591.62	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-10	591.92	591.49	overburden	nm	nm	nm	nm	nm	nm	nm
MW-1A	595.48	597.56	overburden	592.62	590.48	587.89	586.26	585.95	588.35	586.70
MW-1B	595.44	597.64	bedrock	592.64	590.45	587.73	586.52	585.87	588.34	586.76
MW-2A	593.70	595.73	overburden	593.25	591.13	588.96	587.37	586.45	589.43	587.87
MW-2B	593.60	595.80	bedrock	591.92	589.72	586.89	586.03	585.48	587.72	586.38
MW-3A	597.90	599.94	overburden	597.37	595.49	594.30	592.20	592.09	594.48	589.75
MW-3B	597.70	599.70	bedrock	592.63	590.47	587.77	586.64	585.80	588.18	586.69
MW-4A	591.93	591.60	overburden	nm	nm	586.79	585.98	585.24	587.52	586.32
MW-4B	591.90	591.49	bedrock	nm	nm	586.80	585.95	585.23	587.55	586.29
MW-5A	596.14	597.91	overburden	591.18	589.11	586.60	585.79	585.20	587.31	586.00
MW-5B	596.03	597.79	bedrock	591.48	589.55	586.81	585.93	585.25	587.54	586.24
MW-6B	593.10	595.51	bedrock	592.26	589.67	586.85	586.03	585.44	587.67	586.36
MW-7A	593.90	596.59	overburden	593.62	590.94	588.68	587.33	586.45	589.21	587.72
MW-7B	593.90	596.66	bedrock	592.59	589.93	587.26	586.40	585.63	587.93	586.59
MW-8B	597.50	599.63	bedrock	592.51	590.38	587.77	586.65	585.94	588.36	586.90
MW-10A	594.75	596.87	overburden	591.17	588.90	586.51	585.71	585.15	587.20	585.93
MW-10B	594.67	596.71	bedrock	591.71	589.50	586.79	585.93	585.19	587.49	586.21
MW-11A	593.53	595.48	overburden	589.97	587.85	585.98	585.32	584.85	586.62	585.51
MW-11B	593.56	595.57	bedrock	591.53	589.36	586.41	585.55	585.06	587.03	585.73
MW-12A	591.30	590.79	overburden	586.33	586.84	585.35	584.82	584.38	585.77	584.90
MW-12B	591.30	590.89	bedrock	588.85	589.25	586.65	585.93	585.21	587.53	586.21
MW-13A	595.60	595.18	overburden	588.56	589.04	586.51	585.70	585.16	587.30	585.25
MW-13B	595.40	594.73	bedrock	588.62	589.50	586.78	585.90	585.22	587.50	586.22
MW-14A	593.42	592.97	overburden	585.55	585.87	585.60	585.30	582.91	585.95	585.47
MW-14B	593.30	592.85	bedrock	588.35	589.30	586.72	585.83	585.04	587.08	585.83
MW-15B	592.01	591.44	bedrock	nm	nm	586.22	585.57	585.02	587.13	585.86
MW-16A	592.60	591.64	overburden	nm	nm	nm	nm	nm	587.40	586.11
MW-16B	592.60	592.38	bedrock	nm	nm	nm	nm	585.70	nm	586.70
MW-17A	593.45	593.13	overburden	nm	nm	nm	nm	586.26	588.27	586.81
MW-17B	593.44	592.92	bedrock	nm	nm	nm	nm	585.58	587.63	586.29
MW-18A	594.00	593.78	overburden	nm	nm	nm	nm	585.76	587.91	586.94
MW-18B	594.00	593.43	bedrock	nm	nm	nm	nm	585.39	587.67	586.34
MW-19A	595.44	594.95	overburden	nm	nm	nm	nm	586.38	589.16	582.97
MW-19B	595.43	594.65	bedrock	nm	nm	nm	nm	585.91	588.33	586.87
MH-1	na	595.29		nm	nm	nm	nm	583.31	583.35	582.86
MH-2	na	596.51		nm	nm	nm	nm	583.88	583.91	583.85
MH-3	na	596.79		nm	nm	nm	nm	585.61	585.73	nm

Notes: ft amsl - feet above mean sea level
nm - water level not measured

Table 3.1
Groundwater Elevation Summary (1992-2015)
Former Carborundum Company, Hyde Park Facility

Well No.	Elevation (ft. amsl)			Static Water Level Elevation (ft. amsl)						
				2002		2003		2004		2005
	Ground Surface	Top of Monitor Well Casing	Screened Interval (O/B)	13-May-02	28-Oct-02	20-May-03	4-Nov-03	10-May-04	25-Oct-04	31-Oct-05
PMW-1	593.90	596.62	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-2	593.53	595.98	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-3	593.90	596.59	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-4	595.10	597.05	overburden	nm	nm	nm	nm	nm	nm	nm
PMW-5	593.09	592.65	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-6	593.22	592.44	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-7	593.53	592.93	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-8	593.52	593.11	bedrock	nm	nm	nm	nm	nm	nm	nm
PMW-9	592.96	592.45	bedrock	nm	nm	nm	nm	nm	nm	nm
INJ-1	593.90	596.66	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-2	594.19	595.89	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-3	593.25	592.87	bedrock	nm	nm	nm	nm	nm	nm	nm
INJ-4	593.43	593.26	bedrock	nm	nm	nm	nm	nm	nm	nm
INJ-5U	593.50	596.08	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-5L	593.50	596.00	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-6U	593.40	596.96	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-6L	593.40	595.97	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-7	593.04	592.76	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-8	593.18	592.98	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-9	591.90	591.62	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-10	591.92	591.49	overburden	nm	nm	nm	nm	nm	nm	nm
MW-1A	595.48	597.56	overburden	589.42	585.81	589.57	587.62	589.92	587.52	588.85
MW-1B	595.44	597.64	bedrock	589.50	585.80	589.59	587.63	589.96	587.53	588.85
MW-2A	593.70	595.73	overburden	590.55	586.58	590.43	588.91	590.84	588.25	589.75
MW-2B	593.60	595.80	bedrock	588.75	585.43	588.80	586.94	588.99	586.94	588.11
MW-3A	597.90	599.94	overburden	595.81	587.54	595.48	593.41	596.20	592.62	593.95
MW-3B	597.70	599.70	bedrock	589.30	585.69	589.33	587.40	589.73	587.46	588.74
MW-4A	591.93	591.60	overburden	588.55	585.10	588.65	586.48	588.84	586.83	587.73
MW-4B	591.90	591.49	bedrock	588.54	585.35	588.64	586.83	588.85	586.81	587.90
MW-5A	596.14	597.91	overburden	588.35	585.21	588.38	586.82	588.66	586.49	587.76
MW-5B	596.03	597.79	bedrock	588.57	585.32	588.64	586.83	588.85	586.77	587.95
MW-6B	593.10	595.51	bedrock	588.69	585.40	588.75	586.91	588.95	586.90	588.06
MW-7A	593.90	596.59	overburden	590.27	586.35	590.24	588.62	590.59	588.17	589.59
MW-7B	593.90	596.66	bedrock	589.11	585.64	589.13	587.24	589.41	587.29	588.52
MW-8B	597.50	599.63	bedrock	589.52	585.92	589.62	587.69	589.93	587.69	588.97
MW-10A	594.75	596.87	overburden	588.22	585.16	588.26	586.80	588.52	586.47	587.67
MW-10B	594.67	596.71	bedrock	588.54	585.29	588.61	586.83	588.82	586.74	587.94
MW-11A	593.53	595.48	overburden	587.61	584.88	587.67	586.33	587.87	586.06	587.18
MW-11B	593.56	595.57	bedrock	587.83	584.91	587.83	586.42	588.01	586.15	587.30
MW-12A	591.30	590.79	overburden	586.59	584.39	586.79	585.64	586.87	585.51	586.48
MW-12B	591.30	590.89	bedrock	588.56	585.35	588.64	586.82	588.82	586.76	587.97
MW-13A	595.60	595.18	overburden	588.16	585.17	588.32	586.91	588.62	586.65	587.52
MW-13B	595.40	594.73	bedrock	588.56	585.28	588.63	586.99	588.82	586.72	587.94
MW-14A	593.42	592.97	overburden	587.56	584.83	587.43	586.28	586.19	585.29	586.12
MW-14B	593.30	592.85	bedrock	587.96	584.94	587.91	586.48	588.13	586.19	587.37
MW-15B	592.01	591.44	bedrock	588.13	585.04	588.18	586.68	588.44	586.35	587.61
MW-16A	592.60	591.64	overburden	587.80	586.23	587.60	587.28	588.26	588.13	587.72
MW-16B	592.60	592.38	bedrock	nm	585.82	589.36	587.43	589.64	587.49	588.76
MW-17A	593.45	593.13	overburden	589.29	586.02	589.32	587.76	589.60	587.47	588.80
MW-17B	593.44	592.92	bedrock	588.65	585.39	588.70	586.90	588.93	586.83	588.08
MW-18A	594.00	593.78	overburden	589.25	586.17	589.07	587.94	589.58	587.69	588.69
MW-18B	594.00	593.43	bedrock	588.71	585.42	588.77	587.00	588.97	586.90	588.07
MW-19A	595.44	594.95	overburden	590.36	586.09	589.96	588.58	590.16	589.86	589.68
MW-19B	595.43	594.65	bedrock	589.50	585.89	589.60	587.63	589.89	587.63	588.92
MH-1	na	595.29		nm	583.31	583.35	583.35	583.45	583.64	583.58
MH-2	na	596.51		nm	583.71	583.98	583.98	584.04	584.14	584.21
MH-3	na	596.79		nm	583.99	584.09	584.09	584.16	584.26	584.72

Notes: ft amsl - feet above mean sea level
nm - water level not measured

Table 3.1
Groundwater Elevation Summary (1992-2015)
Former Carborundum Company, Hyde Park Facility

Well No.	Elevation (ft. amsl)			Static Water Level Elevation (ft. amsl)					
				2006	2007	2008			
	Ground Surface	Top of Monitor Well Casing	Screened Interval (O/B)	15-May-06	29-Oct-07	21-Apr-08	14-Aug-08	8-Oct-08	8-Dec-08
PMW-1	593.90	596.62	overburden	nm	nm	nm	587.41	586.50	587.96
PMW-2	593.53	595.98	overburden	nm	nm	nm	586.27	586.40	588.60
PMW-3	593.90	596.59	overburden	nm	nm	nm	587.04	586.59	587.52
PMW-4	595.10	597.05	overburden	nm	nm	nm	587.44	586.73	587.64
PMW-5	593.09	592.65	bedrock	nm	nm	nm	nm	nm	nm
PMW-6	593.22	592.44	bedrock	nm	nm	nm	nm	nm	nm
PMW-7	593.53	592.93	bedrock	nm	nm	nm	nm	nm	nm
PMW-8	593.52	593.11	bedrock	nm	nm	nm	586.84	586.25	587.58
PMW-9	592.96	592.45	bedrock	nm	nm	nm	nm	nm	nm
INJ-1	593.90	596.66	overburden	nm	nm	nm	587.03	586.53	587.55
INJ-2	594.19	595.89	overburden	nm	nm	nm	587.26	586.36	587.83
INJ-3	593.25	592.87	bedrock	nm	nm	nm	nm	nm	nm
INJ-4	593.43	593.26	bedrock	nm	nm	nm	nm	nm	nm
INJ-5U	593.50	596.08	overburden	nm	nm	nm	nm	nm	nm
INJ-5L	593.50	596.00	overburden	nm	nm	nm	nm	nm	nm
INJ-6U	593.40	596.96	overburden	nm	nm	nm	nm	nm	nm
INJ-6L	593.40	595.97	overburden	nm	nm	nm	nm	nm	nm
INJ-7	593.04	592.76	overburden	nm	nm	nm	nm	nm	nm
INJ-8	593.18	592.98	overburden	nm	nm	nm	nm	nm	nm
INJ-9	591.90	591.62	overburden	nm	nm	nm	nm	nm	nm
INJ-10	591.92	591.49	overburden	nm	nm	nm	nm	nm	nm
MW-1A	595.48	597.56	overburden	588.77	584.94	588.95	nm	nm	nm
MW-1B	595.44	597.64	bedrock	588.78	584.94	589.02	nm	nm	nm
MW-2A	593.70	595.73	overburden	589.84	585.05	589.68	nm	nm	nm
MW-2B	593.60	595.80	bedrock	587.90	584.54	587.98	nm	nm	nm
MW-3A	597.90	599.94	overburden	595.11	585.37	594.88	588.32	590.61	591.29
MW-3B	597.70	599.70	bedrock	588.74	585.02	588.97	nm	nm	nm
MW-4A	591.93	591.60	overburden	587.65	584.38	587.62	nm	nm	nm
MW-4B	591.90	591.49	bedrock	587.77	584.47	586.94	nm	nm	nm
MW-5A	596.14	597.91	overburden	587.57	584.41	587.63	nm	nm	nm
MW-5B	596.03	597.79	bedrock	587.73	584.44	587.87	nm	nm	nm
MW-6B	593.10	595.51	bedrock	587.84	578.49	587.96	nm	nm	nm
MW-7A	593.90	596.59	overburden	589.55	584.98	589.64	586.59	586.57	587.78
MW-7B	593.90	596.66	bedrock	588.39	584.86	588.56	nm	586.57	588.09
MW-8B	597.50	599.63	bedrock	588.85	585.13	589.07	nm	nm	nm
MW-10A	594.75	596.87	overburden	587.45	584.37	587.51	nm	nm	nm
MW-10B	594.67	596.71	bedrock	587.74	584.43	587.84	nm	nm	nm
MW-11A	593.53	595.48	overburden	586.85	584.14	586.90	nm	nm	nm
MW-11B	593.56	595.57	bedrock	586.94	584.05	587.15	nm	nm	nm
MW-12A	591.30	590.79	overburden	586.00	583.76	585.94	nm	nm	nm
MW-12B	591.30	590.89	bedrock	587.74	584.45	587.94	nm	nm	nm
MW-13A	595.60	595.18	overburden	587.55	588.03	587.83	nm	nm	nm
MW-13B	595.40	594.73	bedrock	587.71	584.31	*587.86*	nm	nm	nm
MW-14A	593.42	592.97	overburden	586.46	583.72	*586.16*	nm	nm	nm
MW-14B	593.30	592.85	bedrock	587.08	584.10	*587.13*	nm	nm	nm
MW-15B	592.01	591.44	bedrock	587.45	584.24	587.42	nm	nm	nm
MW-16A	592.60	591.64	overburden	587.60	587.04	586.54	nm	nm	nm
MW-16B	592.60	592.38	bedrock	588.64	584.98	587.90	nm	nm	nm
MW-17A	593.45	593.13	overburden	588.71	585.13	588.52	587.52	586.53	586.61
MW-17B	593.44	592.92	bedrock	587.78	584.40	587.92	nm	585.76	586.80
MW-18A	594.00	593.78	overburden	588.68	586.08	587.43	nm	nm	nm
MW-18B	594.00	593.43	bedrock	587.87	584.51	587.80	nm	nm	nm
MW-19A	595.44	594.95	overburden	589.75	588.05	588.53	nm	nm	nm
MW-19B	595.43	594.65	bedrock	588.84	585.15	589.07	nm	nm	nm
MH-1	na	595.29		nm	nm	nm	nm	nm	nm
MH-2	na	596.51		nm	nm	nm	nm	nm	nm
MH-3	na	596.79		nm	nm	nm	nm	nm	nm

Notes: ft amsl - feet above mean sea level
nm - water level not measured

Table 3.1
Groundwater Elevation Summary (1992-2015)
Former Carborundum Company, Hyde Park Facility

Well No.	Elevation (ft. amsl)			Static Water Level Elevation (ft. amsl)						
				2009				2010		
	Ground Surface	Top of Monitor Well Casing	Screened Interval (O/B)	27-Jan-09	16-Mar-09	26-Oct-09	9-Dec-09	8-Feb-10	29-Mar-10	5-May-10
PMW-1	593.90	596.62	overburden	587.93	589.15	587.57	590.53	590.60	591.34	590.14
PMW-2	593.53	595.98	overburden	588.49	588.85	587.03	589.62	589.31	589.92	588.93
PMW-3	593.90	596.59	overburden	586.82	589.15	586.44	590.13	589.63	589.27	590.06
PMW-4	595.10	597.05	overburden	588.05	589.34	587.26	589.54	589.25	589.83	588.95
PMW-5	593.09	592.65	bedrock	nm	nm	587.02	588.96	588.56	589.12	588.15
PMW-6	593.22	592.44	bedrock	nm	nm	586.84	588.83	588.43	588.97	587.76
PMW-7	593.53	592.93	bedrock	nm	nm	586.83	588.84	588.46	588.98	587.88
PMW-8	593.52	593.11	bedrock	587.07	588.16	586.91	588.88	588.50	589.04	588.14
PMW-9	592.96	592.45	bedrock	nm	nm	587.10	589.05	588.68	589.21	588.07
INJ-1	593.90	596.66	overburden	587.87	588.93	587.53	589.90	589.22	589.79	589.66
INJ-2	594.19	595.89	overburden	587.67	588.91	587.58	589.34	589.09	589.69	588.76
INJ-3	593.25	592.87	bedrock	nm	nm	586.88	588.83	588.49	588.97	588.08
INJ-4	593.43	593.26	bedrock	nm	nm	587.06	589.01	588.64	589.25	588.22
INJ-5U	593.50	596.08	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-5L	593.50	596.00	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-6U	593.40	596.96	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-6L	593.40	595.97	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-7	593.04	592.76	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-8	593.18	592.98	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-9	591.90	591.62	overburden	nm	nm	nm	nm	nm	nm	nm
INJ-10	591.92	591.49	overburden	nm	nm	nm	nm	nm	nm	nm
MW-1A	595.48	597.56	overburden	587.41	590.10	587.36	nm	nm	nm	nm
MW-1B	595.44	597.64	bedrock	588.40	589.68	587.48	nm	nm	nm	nm
MW-2A	593.70	595.73	overburden	588.35	590.28	587.61	590.61	590.14	590.81	589.84
MW-2B	593.60	595.80	bedrock	587.58	588.35	586.82	588.92	577.90	589.06	588.18
MW-3A	597.90	599.94	overburden	593.02	594.23	591.78	nm	nm	nm	nm
MW-3B	597.70	599.70	bedrock	588.05	589.52	587.33	nm	nm	nm	nm
MW-4A	591.93	591.60	overburden	nm	588.18	587.07	nm	nm	nm	nm
MW-4B	591.90	591.49	bedrock	nm	587.44	587.18	nm	nm	nm	nm
MW-5A	596.14	597.91	overburden	586.79	588.31	586.58	588.43	587.88	588.55	587.65
MW-5B	596.03	597.79	bedrock	587.39	588.48	586.77	588.75	588.35	588.91	588
MW-6B	593.10	595.51	bedrock	587.41	587.55	586.67	nm	588.45	nm	588.11
MW-7A	593.90	596.59	overburden	587.98	588.33	587.39	590.15	589.69	590.39	589.42
MW-7B	593.90	596.66	bedrock	588.05	589.10	587.22	589.35	588.95	589.55	588.63
MW-8B	597.50	599.63	bedrock	588.43	589.67	587.52	nm	nm	nm	588.93
MW-10A	594.75	596.87	overburden	586.83	588.16	586.52	nm	nm	nm	587.53
MW-10B	594.67	596.71	bedrock	587.25	588.52	586.77	588.76	587.49	588.91	587.99
MW-11A	593.53	595.48	overburden	586.03	587.53	586.02	nm	nm	nm	586.98
MW-11B	593.56	595.57	bedrock	586.55	587.63	586.21	587.77	587.35	587.93	587.13
MW-12A	591.30	590.79	overburden	nm	585.85	585.34	nm	nm	nm	586.29
MW-12B	591.30	590.89	bedrock	nm	588.07	586.82	nm	nm	nm	588.04
MW-13A	595.60	595.18	overburden	nm	nm	586.42	nm	nm	nm	nm
MW-13B	595.40	594.73	bedrock	nm	nm	586.34	nm	nm	nm	587.60
MW-14A	593.42	592.97	overburden	nm	nm	584.87	nm	nm	nm	nm
MW-14B	593.30	592.85	bedrock	nm	nm	586.16	nm	nm	nm	587.46
MW-15B	592.01	591.44	bedrock	nm	nm	586.83	nm	nm	nm	587.60
MW-16A	592.60	591.64	overburden	nm	586.59	587.63	585.57	586.18	587.19	587.63
MW-16B	592.60	592.38	bedrock	nm	587.91	587.32	589.34	589.04	589.72	588.77
MW-17A	593.45	593.13	overburden	587.67	588.85	587.29	588.95	588.79	589.51	588.67
MW-17B	593.44	592.92	bedrock	586.94	587.99	586.84	588.82	588.52	588.94	588.08
MW-18A	594.00	593.78	overburden	nm	588.60	587.90	588.84	589.08	589.53	588.62
MW-18B	594.00	593.43	bedrock	nm	588.01	586.93	588.88	588.47	589.03	588.11
MW-19A	595.44	594.95	overburden	nm	588.53	588.33	nm	nm	nm	nm
MW-19B	595.43	594.65	bedrock	nm	589.04	587.55	nm	nm	nm	588.90
MH-1	na	595.29		nm	nm	nm	nm	nm	nm	nm
MH-2	na	596.51		nm	nm	nm	nm	nm	nm	nm
MH-3	na	596.79		nm	nm	nm	nm	nm	nm	nm

Notes: ft amsl - feet above mean sea level
nm - water level not measured

Table 3.1
Groundwater Elevation Summary (1992-2015)
Former Carborundum Company, Hyde Park Facility

Well No.	Elevation (ft. amsl)			Static Water Level Elevation (ft. amsl)					
				2011	2012			2013	
	Ground Surface	Top of Monitor Well Casing	Screened Interval (O/B)	28-Oct-11	12-Mar-12	11-Jun-12	26-Nov-12	27-Aug-13	13-Jan-14
PMW-1	593.90	596.62	overburden	588.27	592.28	590.72	586.59	588.86	591.20
PMW-2	593.53	595.98	overburden	588.36	590.64	589.29	589.39	588.64	591.43
PMW-3	593.90	596.59	overburden	589.08	591.39	589.92	589.99	589.59	591.89
PMW-4	595.10	597.05	overburden	588.63	592.83	588.51	588.40	nm	590.32
PMW-5	593.09	592.65	bedrock	588.06	588.47	587.42	587.71	587.75	589.15
PMW-6	593.22	592.44	bedrock	587.69	588.69	587.52	587.34	587.39	588.31
PMW-7	593.53	592.93	bedrock	587.84	588.80	587.34	587.45	587.48	589.03
PMW-8	593.52	593.11	bedrock	588.09	589.11	587.86	587.74	587.81	589.36
PMW-9	592.96	592.45	bedrock	588.01	589.02	588.12	587.69	587.70	589.21
INJ-1	593.90	596.66	overburden	588.85	591.05	589.68	589.72	589.46	591.70
INJ-2	594.19	595.89	overburden	588.20	590.29	589.12	588.69	588.69	590.92
INJ-3	593.25	592.87	bedrock	589.31	588.77	587.71	587.57	587.61	589.15
INJ-4	593.43	593.26	bedrock	588.15	589.16	587.90	587.90	587.91	589.53
INJ-5U	593.50	596.08	overburden	589.05	590.49	588.91	589.18	589.02	591.08
INJ-5L	593.50	596.00	overburden	588.16	587.92	588.03	583.80	588.65	590.19
INJ-6U	593.40	596.96	overburden	593.01	591.64	590.26	590.15	589.96	592.01
INJ-6L	593.40	595.97	overburden	588.17	589.95	588.70	588.72	588.36	590.29
INJ-7	593.04	592.76	overburden	575.28	590.22	589.81	588.76	589.75	589.46
INJ-8	593.18	592.98	overburden	588.55	589.69	588.30	588.13	587.62	590.03
INJ-9	591.90	591.62	overburden	587.96	588.87	587.58	587.34	587.42	589.22
INJ-10	591.92	591.49	overburden	587.96	589.11	587.95	588.14	587.69	589.11
MW-1A	595.48	597.56	overburden	588.74	589.86	588.50	588.22	588.21	595.81
MW-1B	595.44	597.64	bedrock	588.71	589.85	588.39	588.21	588.29	590.24
MW-2A	593.70	595.73	overburden	589.68	590.98	589.47	589.55	589.13	591.30
MW-2B	593.60	595.80	bedrock	588.12	589.05	587.86	587.78	587.79	589.20
MW-3A	597.90	599.94	overburden	590.01	590.39	591.26	587.98	586.48	595.14
MW-3B	597.70	599.70	bedrock	588.50	589.60	588.31	588.16	588.33	590.10
MW-4A	591.93	591.60	overburden	588.00	590.58	589.09	588.55	587.86	588.40
MW-4B	591.90	591.49	bedrock	588.01	589.04	587.84	587.67	587.93	589.28
MW-5A	596.14	597.91	overburden	587.76	588.59	587.46	587.24	587.27	588.99
MW-5B	596.03	597.79	bedrock	587.97	588.92	587.74	587.59	587.64	589.22
MW-6B	593.10	595.51	bedrock	588.07	589.01	587.82	587.71	587.76	589.35
MW-7A	593.90	596.59	overburden	588.78	nm	590.34	590.13	590.24	590.58
MW-7B	593.90	596.66	bedrock	588.50	589.32	588.18	588.34	590.00	589.91
MW-8B	597.50	599.63	bedrock	588.78	589.92	588.59	588.40	588.53	590.33
MW-10A	594.75	596.87	overburden	587.62	588.49	587.34	587.12	587.15	588.84
MW-10B	594.67	596.71	bedrock	587.97	588.95	587.75	587.62	587.66	589.27
MW-11A	593.53	595.48	overburden	587.09	587.88	586.81	586.65	586.69	588.24
MW-11B	593.56	595.57	bedrock	587.26	588.09	587.01	586.91	587.00	588.63
MW-12A	591.30	590.79	overburden	586.33	587.08	586.22	586.09	586.09	587.44
MW-12B	591.30	590.89	bedrock	587.99	588.95	587.76	587.59	587.69	589.21
MW-13A	595.60	595.18	overburden	587.55	588.63	587.34	587.05	587.10	588.90
MW-13B	595.40	594.73	bedrock	587.54	591.52	587.37	587.18	587.25	588.68
MW-14A	593.42	592.97	overburden	585.36	589.31	585.40	584.74	584.76	585.57
MW-14B	593.30	592.85	bedrock	587.75	588.73	587.57	587.37	587.51	588.95
MW-15B	592.01	591.44	bedrock	591.44	591.44	587.12	nm	587.10	nm
MW-16A	592.60	591.64	overburden	572.84	585.24	584.08	586.90	588.61	584.22
MW-16B	592.60	592.38	bedrock	588.56	589.73	588.47	588.22	588.43	590.38
MW-17A	593.45	593.13	overburden	588.83	589.73	588.74	588.28	588.48	590.02
MW-17B	593.44	592.92	bedrock	588.07	588.99	587.80	587.71	587.52	589.13
MW-18A	594.00	593.78	overburden	588.71	589.44	588.37	588.30	588.19	589.82
MW-18B	594.00	593.43	bedrock	588.05	589.03	587.88	587.70	587.80	589.39
MW-19A	595.44	594.95	overburden	588.25	590.24	589.60	588.76	588.56	590.30
MW-19B	595.43	594.65	bedrock	588.74	589.90	589.57	588.34	588.27	590.28
MH-1	na	595.29		nm	nm	nm	nm	nm	nm
MH-2	na	596.51		nm	nm	nm	nm	nm	nm
MH-3	na	596.79		nm	nm	nm	nm	nm	nm

Notes: ft amsl - feet above mean sea level
nm - water level not measured

Table 3.1
Groundwater Elevation Summary (1992-2015)
Former Carborundum Company, Hyde Park Facility

Well No.	Elevation (ft. amsl)			Static Water Level Elevation (ft. amsl)		
				2014		2015
	Ground Surface	Top of Monitor Well Casing	Screened Interval (O/B)	31-Mar-14	19-Oct-14	16-Nov-15
PMW-1	593.90	596.62	overburden	591.03	587.97	588.72
PMW-2	593.53	595.98	overburden	591.84	588.72	588.91
PMW-3	593.90	596.59	overburden	592.40	588.76	589.39
PMW-4	595.10	597.05	overburden	590.30	587.93	588.32
PMW-5	593.09	592.65	bedrock	589.19	587.25	587.65
PMW-6	593.22	592.44	bedrock	588.87	586.87	587.26
PMW-7	593.53	592.93	bedrock	589.03	587.02	587.45
PMW-8	593.52	593.11	bedrock	589.23	587.26	587.67
PMW-9	592.96	592.45	bedrock	589.20	587.19	587.53
INJ-1	593.90	596.66	overburden	591.50	588.61	588.97
INJ-2	594.19	595.89	overburden	590.48	587.89	588.47
INJ-3	593.25	592.87	bedrock	589.17	587.04	587.42
INJ-4	593.43	593.26	bedrock	589.74	587.39	587.69
INJ-5U	593.50	596.08	overburden	590.97	588.18	588.97
INJ-5L	593.50	596.00	overburden	590.10	587.88	588.25
INJ-6U	593.40	596.96	overburden	591.96	589.26	589.99
INJ-6L	593.40	595.97	overburden	590.62	587.85	588.04
INJ-7	593.04	592.76	overburden	590.70	nm	587.85
INJ-8	593.18	592.98	overburden	590.13	nm	587.62
INJ-9	591.90	591.62	overburden	588.08	587.17	587.60
INJ-10	591.92	591.49	overburden	588.94	587.08	587.48
MW-1A	595.48	597.56	overburden	590.11	587.66	588.12
MW-1B	595.44	597.64	bedrock	590.14	587.66	588.10
MW-2A	593.70	595.73	overburden	591.17	588.43	589.20
MW-2B	593.60	595.80	bedrock	589.29	587.30	587.70
MW-3A	597.90	599.94	overburden	595.70	584.73	585.62
MW-3B	597.70	599.70	bedrock	597.95	587.68	588.05
MW-4A	591.93	591.60	overburden	589.11	587.19	587.58
MW-4B	591.90	591.49	bedrock	589.19	587.19	587.56
MW-5A	596.14	597.91	overburden	588.92	586.86	587.28
MW-5B	596.03	597.79	bedrock	589.17	587.14	587.54
MW-6B	593.10	595.51	bedrock	589.25	nm	587.63
MW-7A	593.90	596.59	overburden	591.18	590.27	588.94
MW-7B	593.90	596.66	bedrock	590.11	588.79	589.85
MW-8B	597.50	599.63	bedrock	590.19	nm	588.29
MW-10A	594.75	596.87	overburden	588.79	586.72	587.09
MW-10B	594.67	596.71	bedrock	589.16	587.18	587.54
MW-11A	593.53	595.48	overburden	588.53	585.87	586.70
MW-11B	593.56	595.57	bedrock	588.27	586.57	587.03
MW-12A	591.30	590.79	overburden	587.59	585.61	585.99
MW-12B	591.30	590.89	bedrock	589.19	587.13	587.55
MW-13A	595.60	595.18	overburden	588.86	586.58	587.02
MW-13B	595.40	594.73	bedrock	588.74	586.72	587.06
MW-14A	593.42	592.97	overburden	585.17	585.04	584.92
MW-14B	593.30	592.85	bedrock	589.05	586.86	587.13
MW-15B	592.01	591.44	bedrock	nm	nm	nm
MW-16A	592.60	591.64	overburden	590.17	nm	588.41
MW-16B	592.60	592.38	bedrock	591.18	584.13	587.78
MW-17A	593.45	593.13	overburden	589.97	587.44	589.01
MW-17B	593.44	592.92	bedrock	589.26	588.31	587.61
MW-18A	594.00	593.78	overburden	589.83	587.68	588.33
MW-18B	594.00	593.43	bedrock	589.33	588.22	587.68
MW-19A	595.44	594.95	overburden	590.82	587.95	588.25
MW-19B	595.43	594.65	bedrock	590.20	587.87	588.35
MH-1	na	595.29		nm	nm	nm
MH-2	na	596.51		nm	nm	nm
MH-3	na	596.79		nm	nm	nm

Notes: ft amsl - feet above mean sea level
nm - water level not measured

APPENDIX B
DATA USABILITY SUMMARY REPORT

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

Prepared For:

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JANUARY 2016

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LIST OF ATTACHMENTS

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park Site in Niagara Falls, New York from November 16, 2015 through November 23, 2015 as part of the annual 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 Eurofins Laboratory (Eurofins). Eurofins 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 28-37 days 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 Eurofins.

1.3 LABORATORY ANALYTICAL METHODS

The groundwater samples collected from the Site were analyzed for volatile organic compounds (VOCs) including methane, ethane, ethene, and propane; dissolved iron; dissolved chloride; dissolved sulfate; dissolved sulfide; total organic carbon (TOC); chemical oxygen demand (COD); nitrite; nitrate; and/or biochemical oxygen demand (BOD). Summaries of the review for 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, comparability, and sensitivity (PARCCS) are discussed for each analytical method in Section 2. The laboratory data were reviewed. Potential validation flags for qualifying data are listed below:

"U" - not detected at the value given,

"UJ" - estimated and not detected at the value given,

"J" - estimated at the value given,

"J+" - estimated biased high at the value given,

"J-" - estimated biased low 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, Ethene, and Propane

The groundwater samples collected from the Site were analyzed for VOCs using the USEPA SW-846 8260C analytical method and methane, ethane, ethene, and propane (MEEP) using the USEPA approved RSK 175 analytical method. Certain reported results for these samples were considered estimated based upon field duplicate precision. The reported VOC and MEEP analytical results were 100% complete (i.e., usable) for the groundwater data presented by Eurofins. PARCCS requirements were met.

1.3.2 Metals Analysis

The groundwater samples collected from the Site were analyzed for dissolved iron using the USEPA SW-846 6010C analytical method. The reported iron sample results did not require qualification resulting from data validation. The reported iron analytical results were 100% complete (i.e., usable) for the groundwater data presented by Eurofins. PARCCS requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Site were analyzed for dissolved chloride and dissolved sulfate using the USEPA 300.0 analytical method; dissolved sulfide using the SM20 4500-S2 analytical method; TOC using the SM20 5310C analytical method; COD using the USEPA 410.4 analytical method; nitrite and nitrate using the USEPA 353.2 analytical method; and/or BOD using the SM20 5210B. Custody documentation, analytical holding times, laboratory blanks, matrix spike/matrix spike duplicate (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 nitrate result for sample MW-12B was considered estimated, possibly biased high, and qualified “J+” based upon a high MS recovery for nitrate (115%R; QC limit 90-110%R);

- The positive COD result for sample MW-7A was considered estimated, possibly biased low, and qualified "J-" based upon a low MS recovery for COD (93%R; QC limit 94-110%R); and
- The nitrite result for sample MW-16B was considered estimated and qualified "UJ" based upon a low MS recovery for nitrite (70%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 Eurofins. PARCCS requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 GROUNDWATER

Data review has been completed for data packages generated by Eurofins containing groundwater samples collected from the Site. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. Analytical sample results were submitted in sample delivery groups (SDGs) BPX55, BPX56, BPX57, BPX58, BPX59, and BPX60. Data validation was performed for all samples in accordance with the most current editions of the NYSDEC ASP and the USEPA Region II SOPs for organic and inorganic data review. This data validation and usability report is presented by analysis type and the validated laboratory data are presented in Attachment A.

2.1.1 Volatiles Including Methane, Ethane, Ethene, and Propane

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 and field duplicate precision as discussed below.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were considered acceptable and within QC limits for designated spiked project samples with the exception of the high MSD accuracy result for methane (149%R; QC limit 85-115%R) and the low MS accuracy results for ethane (84%R; QC limit 85-115%R) and propane (75%R; QC limit 81-115%R) during the spiked

analyses of sample MW-12B; and the high MS/MSD accuracy results for ethene (119%R/118%R; QC limit 83-115%R) during the spiked analyses of sample MW-17A. Validation qualification of the parent samples was not required.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the precision for methane (58%RPD) associated with parent sample MW-18A and its field duplicate sample MW-180A. Therefore, the methane results for these samples were considered estimated and qualified "J."

Usability

All volatile groundwater sample results including methane, ethane, ethene, and propane were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The volatile groundwater data presented by Eurofins were 100% (i.e., usable). The validated volatile laboratory data are tabulated and presented in Attachment A.

It was noted that certain samples 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.

2.1.2 Dissolved Iron

The following items were reviewed for compliancy in the dissolved 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 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.

Usability

All dissolved iron sample results were considered usable following data review.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The dissolved iron data presented by Eurofins were 100% complete (i.e., usable). The validated groundwater laboratory data are tabulated and presented in Attachment A.

ATTACHMENT A

VALIDATED LABORATORY DATA

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility November 2015		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-2B MW-2B_2015-11-20 8145515 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016	MW-4A MW-4A_2015-11-18 8141874 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-5A MW-5A_2015-11-17/20 8139304/8145519 LANCASTERLABS BPX56/59 WATER 11/17-20/2015 1/11/2016	MW-5B MW-5B_2015-11-17 8139301 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	Dup of MW-5B_2015-11-17 MW-5B MW-50B_2015-11-17 8139302 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	MW-6 MW-6_2015-11-20 8145518 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.65 J	1	1.4	0.5 U	0.5 U	0.5 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	0.5 U	3	1.5	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.87 J	1.3	150	34	33	20
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.56 J	0.5 U	1.6	0.5 U	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	1.2	0.5 U	0.58 J	0.6 J	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	3.4	1.1	140	65	63	57
74-85-1	ETHENE	ug/l		18	39	2.3 J	2.4 J	
74-84-0	ETHANE	ug/l		5.2	5.4	1 U	1 U	
74-82-8	METHANE	ug/l		17000	2000	120	120	
74-98-6	PROPANE	ug/l		1 U	1 U	1 U	1 U	
	DISSOLVED METALS							
7439-89-6	IRON	mg/l		14.5	0.0333 U	0.502	0.497	
	WET CHEM							
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	mg/l		70.6	6 U	5.1 U	4.8 U	
18496-25-8	SULFIDE	mg/l		0.085 J	0.054 U	0.054 U	0.054 U	
TOC	TOTAL ORGANIC CARBON	mg/l		36.6	0.5 U	3.1	3.1	
16887-00-6	CHLORIDE (AS CL)	mg/l		123	102	117	118	
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l		443	12.8 U	17.5 J	15.2 J	
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l		0.04 U	0.61	0.04 U	0.04 U	
14797-65-0	NITROGEN, NITRITE	mg/l		0.015 U	0.015 U	0.015 U	0.015 U	
14808-79-8	SULFATE (AS SO4)	mg/l		5.6	102	251	254	

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility November 2015		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-7A MW-7A_2015-11-19 8143667 LANCASTERLABS BPX58 WATER 11/19/2015 1/11/2016	MW-7B MW-7B_2015-11-23 8148046 LANCASTERLABS BPX60 WATER 11/23/2015 1/11/2016	MW-8 MW-8_2015-11-23 8148045 LANCASTERLABS BPX60 WATER 11/23/2015 1/11/2016	MW-10A MW-10A_2015-11-18 8141879 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-10B MW-10B_2015-11-16 8136961 LANCASTERLABS BPX55 WATER 11/16/2015 1/11/2016	MW-11B MW-11B_2015-11-17 8139306 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	11	0.5 U	0.5 U	5.3	0.9 J	1
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.52 J	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	4.8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	1.5	1.2	1.7	710	190	0.56 J
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	9.1	0.68 J	0.57 J
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	3.1	6.1	1.9	130	190	1.7
74-85-1	ETHENE	ug/l	1.1 J	4.3 J		17	190	
74-84-0	ETHANE	ug/l	2.8 J	1 U		1 U	2.1 J	
74-82-8	METHANE	ug/l	5900	11000		220	2900	
74-98-6	PROPANE	ug/l	1 U	1 U		1 U	1.5 J	
	DISSOLVED METALS							
7439-89-6	IRON	mg/l	7.85	0.0333 U		1.81	0.0333 U	
	WET CHEM							
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	mg/l	99.3	22.2		2.9 U	6 U	
18496-25-8	SULFIDE	mg/l	0.22	20.4		0.054 U	0.71	
TOC	TOTAL ORGANIC CARBON	mg/l	84.3	10.8		0.87 J	3	
16887-00-6	CHLORIDE (AS CL)	mg/l	24.6	189		434	145	
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	293 J-	97.8		22.1 J	17.5 J	
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.04 U	0.04 U		0.04 U	0.04 U	
14797-65-0	NITROGEN, NITRITE	mg/l	0.015 U	0.015 U		0.015 U	0.015 U	
14808-79-8	SULFATE (AS SO4)	mg/l	20.2	146		170	207	

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility November 2015		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-12A MW-12A_2015-11-17 8139305 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	MW-12B MW-12B_2015-11-16 8136960 LANCASTERLABS BPX55 WATER 11/16/2015 1/11/2016	MW-13B MW-13B_2015-11-17 8139303 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	MW-14B MW-14B_2015-11-18 8141875 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-16A MW-16A_2015-11-20 8145520 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016	MW-16B MW-16B_2015-11-20 8145514 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.7 J	0.5 U	0.5 U	0.53 J	0.5 U	6.6
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.2
75-00-3	CHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	1.6	13	18	0.95 J	9.1	1100
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	22
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.8
75-01-4	VINYL CHLORIDE	ug/l	9.6	9.1	21	1.5	250	780
74-85-1	ETHENE	ug/l	1 U	1 U			95	920
74-84-0	ETHANE	ug/l	1 U	1 U			1.2 J	40
74-82-8	METHANE	ug/l	140	25			49	24000
74-98-6	PROPANE	ug/l	1 U	1 U			1 U	1 U
	DISSOLVED METALS							
7439-89-6	IRON	mg/l	2.27	0.111 J			0.0333 U	0.0333 U
	WET CHEM							
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	mg/l	3.8 U	4.7 U			5.2 U	105
18496-25-8	SULFIDE	mg/l	0.079 J	0.054 U			0.054 U	36.5
TOC	TOTAL ORGANIC CARBON	mg/l	7.7	9.2			6.5	47.3
16887-00-6	CHLORIDE (AS CL)	mg/l	63.6	148			290	70.6
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	26.7 J	22.1 J			33.6 J	215
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.04 U	0.2 J+			0.04 U	0.04 U
14797-65-0	NITROGEN, NITRITE	mg/l	0.015 U	0.039 J			0.015 U	0.015 UJ
14808-79-8	SULFATE (AS SO4)	mg/l	119	244			1080	4.2

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility November 2015		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-17A MW-17A_2015-11-18 8141872 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016
CAS NO.	COMPOUND	UNITS:	
	VOLATILES		
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	18
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U
75-00-3	CHLOROETHANE	ug/l	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	160
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	86
74-85-1	ETHENE	ug/l	11
74-84-0	ETHANE	ug/l	12
74-82-8	METHANE	ug/l	15000
74-98-6	PROPANE	ug/l	1 U
	DISSOLVED METALS		
7439-89-6	IRON	mg/l	1.45
	WET CHEM		
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	mg/l	7.3
18496-25-8	SULFIDE	mg/l	0.054 U
TOC	TOTAL ORGANIC CARBON	mg/l	3
16887-00-6	CHLORIDE (AS CL)	mg/l	167
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	15.2 J
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.04 U
14797-65-0	NITROGEN, NITRITE	mg/l	0.015 U
14808-79-8	SULFATE (AS SO4)	mg/l	114

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility November 2015		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-17B MW-17B_2015-11-18 8141873 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-18A MW-18A_2015-11-18 8141876 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	Dup of MW-18A_2015-11-18 MW-18A MW-180A_2015-11-18 8141878 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-18B MW-18B_2015-11-18 8141877 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	MW-19B MW-19B_2015-11-17 8139298 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	FIELDQC TripBlank1_2015-11-16 8136959 LANCASTERLABS BPX55 WATER 11/16/2015 1/11/2016
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	1.5	4.5	4.7	0.5 U	0.5 U	0.5 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	1.1	1.2	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	7.9	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.5 U	51	53	35	1.8	0.5 U
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	0.73 J	0.76 J	0.5 U	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	38	39	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	0.8 J	2.3	2.8	40	1	0.5 U
74-85-1	ETHENE	ug/l	8.9	1 U	1 U	15		
74-84-0	ETHANE	ug/l	8.5	1 U	1 U	3.5 J		
74-82-8	METHANE	ug/l	14000	11 J	20 J	18000		
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U		
	DISSOLVED METALS							
7439-89-6	IRON	mg/l	13.4	1.5	1.47	2.54		
	WET CHEM							
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	mg/l	17.6	2.8 U	2.9 U	35.7		
18496-25-8	SULFIDE	mg/l	1.4	0.054 U	0.054 U	1.5		
TOC	TOTAL ORGANIC CARBON	mg/l	18.8	1.2	1.3	41.5		
16887-00-6	CHLORIDE (AS CL)	mg/l	374	113	111	62.2		
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	102	12.8 U	12.8 U	167		
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.04 U	0.04 U	0.04 U	0.04 U		
14797-65-0	NITROGEN, NITRITE	mg/l	0.015 U	0.015 U	0.015 U	0.015 U		
14808-79-8	SULFATE (AS SO4)	mg/l	2.5 J	118	120	70.9		

Analytical Summary Table for Chemicals of Concern Validated 2015-Groundwater Samples Former Carborundum Company, Hyde Park Facility November 2015		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	FIELDQC TripBlank1_2015-11-17 8139297 LANCASTERLABS BPX56 WATER 11/17/2015 1/11/2016	FIELDQC TripBlank1_2015-11-18 8141869 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016	TripBlank1 TripBlank1_2015-11-19 8143666 LANCASTERLABS BPX58 WATER 11/19/2015 1/11/2016	FIELDQC TripBlank1_2015-11-20 8145513 LANCASTERLABS BPX59 WATER 11/20/2015 1/11/2016	FIELDQC TripBlank1_2015-11-23 8148044 LANCASTERLABS BPX60 WATER 11/23/2015 1/11/2016	FIELDQC TripBlank2_2015-11-18 8141870 LANCASTERLABS BPX57 WATER 11/18/2015 1/11/2016
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-85-1	ETHENE	ug/l						
74-84-0	ETHANE	ug/l						
74-82-8	METHANE	ug/l						
74-98-6	PROPANE	ug/l						
	DISSOLVED METALS							
7439-89-6	IRON	mg/l						
	WET CHEM							
BOD	BIOCHEMICAL OXYGEN DEMAND (BOD)	mg/l						
18496-25-8	SULFIDE	mg/l						
TOC	TOTAL ORGANIC CARBON	mg/l						
16887-00-6	CHLORIDE (AS CL)	mg/l						
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l						
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l						
14797-65-0	NITROGEN, NITRITE	mg/l						
14808-79-8	SULFATE (AS SO4)	mg/l						

APPENDIX C
GROUNDWATER SAMPLING LOGS (FALL 2015)

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-2B

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 8.19

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/20/2015

Time: (hhmm) 11:10

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
11:10	8.19	200	0	6.51	12.07	40.4	1.07	12.11	.675	-238	
11:20	8.35	200	.25	6.30	7.52	5.9	1.79	12.81	1.15	-306	
11:30	8.36	200	0.75	6.09	7.2	0	1.88	12.91	1.2	-314	
11:45	8.38	200	1.8	5.97	7.23	0	1.86	13.21	1.19	-313	
11:50	8.39	200	2.2	5.95	7.23	0	1.83	13.27	1.17	-312	
11:55	8.39	200	2.6	5.93	7.25	0	1.82	13.33	1.16	-312	Clear

Method: Dedicated tubing

Date: 11/20/2015

Time: (hhmm) 11:55

Total Volume of Water Purged: 2.6 (gal)

STABILIZED PARAMETERS

pH	5.93
Spec. Cond.(mS/cm)	1.82
Turbidity (NTU)	0
DO (mg/L)	7.25
Temp.(°C)	13.33
ORP (mv)	-312
TDS (g/L)	1.16

HACH TEST KITS

Alkalinity (g/g)	600
Carbon Dioxide (mg/L)	370
Ferrous Iron (mg/L)	0.2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	5
DTW (ft)	8.39

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Ms/msd collected.

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-4A

Manual Entry:

Well Diameter: 2 inches

Samplers: Select...

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 3.82

Depth to Well Bottom (ft): 18.42

Purging Data

Method: Low flow

Date: 11/18/2015

Time: 13:30 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
13:40	5.3	125	0.1	6.81	4.79	26	1.81	15.42	1.16	-77	
13:55	7	125	0.5	6.53	3.44	67.1	1.77	15.76	1.13	-66	
14:10	8.08	125	0.7	6.43	3.07	51.3	1.77	15.76	1.13	-61	
14:15	8.45	125	0.9	6.41	3.02	36.8	1.78	15.78	1.14	-61	
14:20	8.6	125	1.1	6.40	2.97	34.3	1.78	15.85	1.14	-62	
14:25	8.8	125	1.25	6.37	2.97	48.6	1.88	15.92	1.20	-61	
14:30	9	125	1.4	6.35	2.90	73.3	1.89	15.95	1.21	-62	
14:35	9.1	125	1.6	6.35	2.91	79.6	1.90	15.95	1.21	-63	
14:40	9.28	125	1.75	6.34	2.90	75.1	1.93	15.98	1.24	-63	
14:45	9.45	125	1.9	6.33	2.88	76.4	1.96	15.99	1.26	-65	
14:50	9.48	125	2.0	6.32	2.88	78.5	1.97	15.99	1.26	-66	
14:55	9.62	125	2.1	6.33	2.87	88.4	1.94	15.97	1.24	-67	
15:00	9.63	125	2.25	6.32	2.88	89.9	1.93	15.94	1.23	-67	
15:05	9.65	125	2.4	6.33	2.87	91	1.92	15.93	1.23	-67	

Method: Dedicated tubing

Date: 11/18/2015

Time: *(hhmm)* 15:05

Total Volume of Water Purged: 2.4 (gal)

STABILIZED PARAMETERS	
pH	6.33
Spec. Cond.(mS/cm)	1.92
Turbidity (NTU)	91
DO (mg/L)	2.87
Temp.(°C)	15.93
ORP (mv)	-67
TDS (g/L)	1.23

HACH TEST KITS	
Alkalinity (g/g)	1,000
Carbon Dioxide (mg/L)	460
Ferrous Iron (mg/L)	1.8
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	9.65
* NOTE * HACH test kits are only required for MNA analysis wells.	

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-5A

Manual Entry:

Samplers: Dan Chamberland

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 10.7

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/17/2015

Time: (hhmm) 12:50

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
12:50	10.7	200	0.0	7.65	5.08	698	0.662	15.23	0.430	44	
13:00	11.05	200	0.5	7.71	0.08	65	0.640	15.63	0.410	54	
13:10	11.07	200	1.0	7.64	0.0	12.9	0.646	15.77	0.414	59	
13:20	11:09	200	1.5	7.59	0.0	11.6	0.651	15.85	0.417	60	
13:25	11.10	200	1.7	7.58	0.0	8.7	0.652	15.90	0.417	60	
13:30	11.10	200	1.9	7.56	0.0	6.9	0.653	15.96	0.418	61	
13:35	11.10	200	2.2	7.54	0.0	7.7	0.655	15.95	0.419	61	
13:40	11.11	200	2.5	7.51	0.0	9.1	0.656	15.95	0.420	61	
13:45	11.11	200	2.7	7.50	0.0	12.7	0.661	15.97	0.424	60	
13:50	11.11	200	3.0	7.49	0.0	13.8	0.668	16.00	0.428	60	

Method: Dedicated tubing

Date: 11/17/2015

Time: (hhmm) 13:50

Total Volume of Water Purged: 3 (gal)

STABILIZED PARAMETERS

pH	7.49
Spec. Cond.(mS/cm)	0.668
Turbidity (NTU)	13.8
DO (mg/L)	0.0
Temp.(°C)	16.00
ORP (mv)	60
TDS (g/L)	0.428

HACH TEST KITS

Alkalinity (g/g)	103
Carbon Dioxide (mg/L)	56.5
Ferrous Iron (mg/L)	0.2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	11.11

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-5A

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 10.85

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/20/2015

Time: 13:35 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
13:35	11.11	150	0	7.11	9.32	378	.840	14.05	.538	-194	
13:45	11.05	150	0.3	7.03	6.96	37.4	.828	14.19	.530	-207	Clear
13:55	11.06	150	0.8	7.02	6.22	0	.784	14.38	.502	-208	Clear
14:05	11.06	150	1.4	7.01	5.68	0	.778	14.56	.498	-207	Clear
14:10	11.09	150	1.8	7	4.75	0	.778	14.72	.498	-207	Clear
14:15	11.09	150	2.1	6.99	4.68	0	.778	14.79	.498	-207	Clear
14:20	11.09	150	2.4	6.99	4.62	0	.777	14.82	.498	-207	Clear

Method: Dedicated tubing

Date: 11/20/2015

Time: *(hhmm)* 14:20

Total Volume of Water Purged: 2.4 (gal)

STABILIZED PARAMETERS

pH	6.99
Spec. Cond.(mS/cm)	.777
Turbidity (NTU)	0
DO (mg/L)	4.62
Temp.(°C)	14.82
ORP (mv)	-207
TDS (g/L)	.498

HACH TEST KITS

Alkalinity (g/g)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	
DTW (ft)	11.09

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☐	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Sample for BOD only on 11-20-2015.

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-5B

Manual Entry:

Samplers: Dan Chamberland

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 10.28

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/17/2015

Time: 09:10 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
09:10	10.28	200	0.0	5.36	0.81	9.1	0.583	10.94	0.374	89	
09:20	10:30	200	0.5	6.81	0.0	2.13	0.597	13.42	0.382	33	
09:30	10.32	200	1.0	6.87	0.0	4.6	0.898	13.56	0.567	-10	
09:40	10:34	200	1.5	6.92	1.30	3.7	1.24	13.65	0.793	-23	
09:45	10.32	200	1.7	6.93	0.0	1.9	1.22	13.72	0.786	-28	
09:50	10.32	200	1.9	6.94	0.0	0.5	1.21	13.86	0.777	-33	
09:55	10.32	200	2.2	6.94	0.0	0.4	1.21	13.87	0.771	-37	
10:00	10.32	200	2.4	6.93	0.0	0.3	1.20	13.89	0.767	-40	
10:05	10.32	200	2.6	6.96	0.0	0.5	1.19	13.94	0.764	-42	
10:10	10.32	200	2.9	6.99	0.0	1.3	1.18	14.01	0.759	-44	

Method: Dedicated tubing

Date: 11/17/2015

Time: *(hhmm)* 10:10

Total Volume of Water Purged: 2.9 (gal)

STABILIZED PARAMETERS	
pH	6.99
Spec. Cond.(mS/cm)	1.18
Turbidity (NTU)	1.3
DO (mg/L)	0.0
Temp.(°C)	14.01
ORP (mv)	-44
TDS (g/L)	0.759

HACH TEST KITS	
Alkalinity (g/g)	140
Carbon Dioxide (mg/L)	86
Ferrous Iron (mg/L)	0.8
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.6
DTW (ft)	10.32

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-6

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 7.98

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/20/2015

Time: (hhmm) 12:30

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
12:30	7.98	200	0	6.91	13.01	0	1.16	13.79	.740	-198	
12:40	8.01	200	0.5	6.82	7.89	0	1.21	13.08	.775	-234	
12:55	8.04	200	1.6	6.63	7.75	0	1.22	12.51	.781	-255	Clear
13:00	8.05	200	2.1	6.61	7.66	0	1.22	12.49	.781	-255	
13:05	8.05	200	2.6	6.58	7.67	0	1.22	12.37	.782	-257	Clear

Method: Dedicated tubing

Date: 11/20/2015

Time: (hhmm) 13:05

Total Volume of Water Purged: 2.6 (gal)

STABILIZED PARAMETERS

pH	6.58
Spec. Cond.(mS/cm)	1.22
Turbidity (NTU)	0
DO (mg/L)	7.67
Temp.(°C)	12.37
ORP (mv)	-257
TDS (g/L)	.782

HACH TEST KITS

Alkalinity (g/g)	105
Carbon Dioxide (mg/L)	162
Ferrous Iron (mg/L)	0
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.2
DTW (ft)	8.05

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-7A

Manual Entry:

Well Diameter: inches

Samplers: Dan Chamberland

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 7.62

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/19/2015

Time: 14:50 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
14:50	7.62	200	0.0	6.25	0.0	92.0	2.06	15.03	1.32	-24	
15:00	10.30	200	0.5	6.59	0.0	62.3	1.86	14.99	1.19	-71	
15:10	12.20	200	1.0	6.77	0.95	22.8	1.86	15.24	1.19	-86	
15:20	13.80	200	1.5	6.80	0.83	22.7	1.86	15.29	1.19	-86	
15:25	14.20	200	1.7	6.82	0.90	24.6	1.85	15.27	1.19	-85	
15:30	14.65	200	1.9	6.84	0.95	20.4	1.84	15.25	1.18	-84	
15:35	15.05	200	2.1	6.82	0.87	26.7	1.86	15.23	1.19	-82	
15:40	15.50	100	2.2	6.81	0.80	31.1	1.88	15.21	1.20	-79	
15:45	16.00	100	2.3	6.79	0.68	26.4	1.89	15.13	1.20	-76	
15:50	16.45	100	2.4	6.78	0.57	23.0	1.90	15.07	1.21	-73	
15:55	16.53	100	2.6	6.77	0.62	27.2	1.90	15.09	1.21	-72	
16:00	16.68	100	2.7	6.74	0.58	32.4	1.91	15.02	1.22	-69	
16:05	16.70	100	2.8	6.73	0.50	19.0	1.92	14.91	1.23	-68	
16:10	16.68	100	2.9	6.71	0.53	12.7	1.93	14.86	1.24	-67	
16:15	16.67	100	3.0	6.69	0.53	13.8	1.97	14.76	1.26	-67	

Method: Dedicated tubing

Date: 11/19/2015

Time: *(hhmm)* 16:15

Total Volume of Water Purged: 3 (gal)

STABILIZED PARAMETERS

pH	6.69
Spec. Cond.(mS/cm)	1.97
Turbidity (NTU)	13.8
DO (mg/L)	err
Temp.(°C)	14.76
ORP (mv)	-67
TDS (g/L)	1.26

HACH TEST KITS

Alkalinity (g/g)	297.5
Carbon Dioxide (mg/L)	350
Ferrous Iron (mg/L)	2.8
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.1
DTW (ft)	16.67

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-7B

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 6.55

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/23/2015

Time: 11:00 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
11:00	6.55	220	0	6.99	12.19	391	1.5	12.13	.957	-282	
11:10	6.55	220	0.75	6.76	9.61	160	1.46	12.46	.933	-325	
11:20	6.55	250	1.5	6.71	9.09	88.8	1.46	12.86	.936	-329	
11:25	6.55	250	1.9	6.69	9.09	45	1.48	12.68	.947	-330	
11:30	6.55	250	2.2	6.68	9.17	41	1.48	12.5	.948	-331	
11:35	6.55	250	2.6	6.67	9.17	44.4	1.49	12.4	.957	-329	

Method: Dedicated tubing

Date: 11/23/2015

Time: *(hhmm)* 11:35

Total Volume of Water Purged: 2.6 (gal)

STABILIZED PARAMETERS

pH	6.67
Spec. Cond.(mS/cm)	1.49
Turbidity (NTU)	44.4
DO (mg/L)	9.17
Temp.(°C)	12.4
ORP (mv)	-329
TDS (g/L)	.957

HACH TEST KITS

Alkalinity (g/g)	87.5
Carbon Dioxide (mg/L)	186
Ferrous Iron (mg/L)	0
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	5
DTW (ft)	6.55

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-8

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 11.54

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/23/2015

Time: 9:30 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
9:30	11.54	210	0	5.44	8.39	1.6	1.27	9.91	.815	-63	Clear
9:40	11.65	210	.5	6.39	5.36	0	1.25	11.24	.803	-170	Clear
9:50	11.65	210	1	6.66	4.68	0	1.25	11.50	.803	-199	Clear
10:00	11.65	210	2	6.75	4.45	0	1.27	11.66	.813	-214	Clear
10:10	11.65	210	3	6.8	4.33	0	1.27	11.80	.815	-230	
10:20	11.65	210	3.5	6.81	4.30	0	1.28	11.83	.816	-236	
10:25	11.65	210	4	6.82	4.27	0	1.27	11.86	.815	-239	Clear

Method: Dedicated tubing

Date: 11/23/2015

Time: *(hhmm)* 10:25

Total Volume of Water Purged: 4 (gal)

STABILIZED PARAMETERS

pH	6.82
Spec. Cond.(mS/cm)	1.27
Turbidity (NTU)	0
DO (mg/L)	4.27
Temp.(°C)	11.86
ORP (mv)	-239
TDS (g/L)	.815

HACH TEST KITS

Alkalinity (g/g)	105
Carbon Dioxide (mg/L)	160
Ferrous Iron (mg/L)	0
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	2
DTW (ft)	11.65

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-10A

Manual Entry:

Well Diameter: 2 inches

Samplers: Dan Chamberland

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 9.78

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/18/2015

Time: 08:50 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
08:50	9.78	200	0.0	6.05	0.0	83.8	0.987	14.32	0.629	64	
09:00	9.83	200	0.5	6.89	0.0	28.8	0.961	15.11	0.615	-55	
09:10	9.85	200	1.0	6.96	0.0	11.9	0.964	15.23	0.616	-73	
09:20	9.84	200	1.5	7.01	0.0	8.0	0.964	15.30	0.616	-89	
09:25	9.84	200	1.7	7.01	0.0	13.6	0.964	15.33	0.616	-86	
09:30	9.84	200	1.9	7.02	0.0	20.5	0.964	15.36	0.617	-84	
09:35	9.84	200	2.2	7.03	0.0	16.7	0.965	15.37	0.617	-85	
09:40	9.85	200	2.4	7.04	0.0	14.7	0.966	15.39	0.617	-86	

Method: Dedicated tubing

Date: 11/18/2015

Time: *(hhmm)* 09:40

Total Volume of Water Purged: 2.4 (gal)

STABILIZED PARAMETERS	
pH	7.04
Spec. Cond.(mS/cm)	0.966
Turbidity (NTU)	14.7
DO (mg/L)	0.0
Temp.(°C)	15.39
ORP (mv)	-86
TDS (g/L)	0.617

HACH TEST KITS	
Alkalinity (g/g)	70
Carbon Dioxide (mg/L)	60
Ferrous Iron (mg/L)	1.8
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.1
DTW (ft)	9.85

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-10B

Manual Entry:

Well Diameter: 4 inches

Samplers: Dan Chamberland

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 9.01

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/16/2015

Time: 13:55 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
13:55	9.01	200	0.0	6.95	0.22	0.34	1.30	15.16	0.829	-51	Clear
14:05	9.15	200	0.5	7.03	0.0	5.4	1.28	15.11	0.819	-72	Light
14:15	9.17	200	1.0	7.08	0.0	1.4	1.25	15.17	0.800	-86	Substrate
14:25	9.19	200	1.5	7.09	0.0	1.23	1.24	15.48	0.796	-94	Odor
14:30	9.19	200	1.7	7.11	0.0	2.8	1.24	15.51	0.794	-97	
14:35	9.19	200	1.9	7.13	0.0	3.4	1.24	15.55	0.792	-100	
14:40	9.19	200	2.2	7.14	0.0	1.1	1.24	15.45	0.792	-102	
14:45	9.19	200	2.4	7.15	0.0	0.5	1.24	15.36	0.791	-104	
14:50	9.19	200	2.6	7.16	0.0	1.9	1.23	15.38	0.789	-106	
14:55	9.19	200	2.9	7.17	0.0	1.0	1.22	15.31	0.782	-107	

Method: Dedicated tubing

Date: 11/16/2015

Time: *(hhmm)* 14:55

Total Volume of Water Purged: 2.9 (gal)

STABILIZED PARAMETERS	
pH	7.17
Spec. Cond.(mS/cm)	1.22
Turbidity (NTU)	1
DO (mg/L)	0.0
Temp.(°C)	15.31
ORP (mv)	-107
TDS (g/L)	0.782

HACH TEST KITS	
Alkalinity (g/g)	340
Carbon Dioxide (mg/L)	105.2
Ferrous Iron (mg/L)	0
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.2
DTW (ft)	9.19

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-11B

Manual Entry:

Samplers: Select...

Well Diameter: 4 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 8.5

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/17/2015

Time: 15:10 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
15:15	8.5	250	0	7.05	3.5	3.33	1.05	15.67	.671	-176	
15:20	8.88	175	.25	7.07	3.3	1.61	1.05	15.65	.672	-182	
15:25	8.80	175	.4	7.07	3.5	1.28	1.05	15.60	.675	-198	
15:35	8.8	175	.6	7.08	4.07	.51	1.06	15.6	.681	-218	
15:40	8.8	175	.9	7.08	4.36	.86	1.06	15.59	.680	-230	
15:45	8.85	200	1.25	7.08	4.55	.89	1.19	15.55	.759	-241	
15:55	8.85	200	1.9	7.1	4.63	1.02	1.18	15.42	.756	-251	
16:00	8.85	200	2.1	7.09	4.65	1.15	1.18	15.39	.756	-252	Clear
16:05	8.85	200	2.5	7.09	4.72	.62	1.18	15.36	.758	-253	Clear

Method: Dedicated tubing

Date: 11/17/2015

Time: *(hhmm)* 16:05

Total Volume of Water Purged: 2.5 (gal)

STABILIZED PARAMETERS	
pH	7.09
Spec. Cond.(mS/cm)	1.18
Turbidity (NTU)	0.62
DO (mg/L)	4.72
Temp.(°C)	15.36
ORP (mv)	-253
TDS (g/L)	.758

HACH TEST KITS	
Alkalinity (g/g)	300
Carbon Dioxide (mg/L)	220
Ferrous Iron (mg/L)	0
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	5
DTW (ft)	8.85

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-12A

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 4.8

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/17/2015

Time: (hhmm) 13:25

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
13:30	4.8	150	0	8.04	5.65	31.6	.252	14.84	.163	99	
13:45	4.85	150	.5	7.54	3.9	18.6	.297	14.97	.194	111	
13:50	4.85	150	.75	7.27	3.46	9.24	.535	14.93	.334	54	
13:55	4.85	150	1	7.07	3.29	4.35	.659	14.89	.418	-87	
14:00	4.85	150	1.25	7.07	3.25	4.22	.662	14.85	.424	-90	
14:05	4.85	150	1.5	7.07	3.24	3.14	.666	14.83	.426	-92	Clear

Method: Dedicated tubing

Date: 11/17/2015

Time: (hhmm) 14:05

Total Volume of Water Purged: 1.5 (gal)

STABILIZED PARAMETERS

pH	7.07
Spec. Cond.(mS/cm)	.666
Turbidity (NTU)	3.14
DO (mg/L)	err
Temp.(°C)	14.83
ORP (mv)	-92
TDS (g/L)	.426

HACH TEST KITS

Alkalinity (g/g)	100
Carbon Dioxide (mg/L)	114
Ferrous Iron (mg/L)	2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	4.85

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-12B

Manual Entry:

Well Diameter: 4 inches

Samplers: Dan Chamberland

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 3.33

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/16/2015

Time: 14:00 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
14:05	3.35	250	0	5.41	6.89	8.82	.349	13.07	.229	281	Clear
14:15	3.35	250	.75	6.74	5.87	3.32	.246	13.91	.160	244	Clear
14:20	3.35	250	1.25	6.86	5.69	4.58	.249	14.13	.162	241	Clear
14:25	3.36	250	1.6	6.96	5.23	2.18	.373	14.3	.167	239	Clear
14:30	3.36	250	2.1	6.97	4.93	1.76	.434	14.41	.218	236	Clear
14:35	3.36	250	2.4	6.96	4.86	1.48	.463	14.5	.245	233	Clear
14:40	3.36	250	2.75	6.97	4.7	1.32	.462	14.62	.265	226	Clear

Method: Dedicated tubing

Date: 11/16/2015

Time: *(hhmm)* 14:40

Total Volume of Water Purged: 2.75 (gal)

STABILIZED PARAMETERS

pH	6.97
Spec. Cond.(mS/cm)	.462
Turbidity (NTU)	1.32
DO (mg/L)	4.70
Temp.(°C)	14.62
ORP (mv)	226
TDS (g/L)	.265

HACH TEST KITS

Alkalinity (g/g)	260
Carbon Dioxide (mg/L)	127.8
Ferrous Iron (mg/L)	0.2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	3.36

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

Sampled by Rob Piurek, not Dan Chamberland.

Replacement form submitted in the office using iPad screenshots.

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-13B

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 7.7

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/17/2015

Time: (hhmm) 11:15

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
11:25	7.7	250	0	6.9	5.22	23.9	1.2	14.97	.767	-44	
11:35	7.8	250	.4	7.35	3.62	25.2	1.56	14.84	1	-29	
11:45	7.85	250	.8	7.4	3.41	12.1	1.54	14.73	.984	-19	
11:55	7.85	250	1.6	7.31	3.44	5.75	1.61	14.74	1.03	-13	
12:00	7.85	250	2	7.3	3.44	5.38	1.65	14.64	1.06	-12	
12:05	7.85	250	2.25	7.29	3.39	3.81	1.66	14.61	1.06	-11	Clear

Method: Dedicated tubing

Date: 11/17/2015

Time: (hhmm) 12:05

Total Volume of Water Purged: 2.25 (gal)

STABILIZED PARAMETERS	
pH	7.29
Spec. Cond.(mS/cm)	1.66
Turbidity (NTU)	3.81
DO (mg/L)	3.39
Temp.(°C)	14.61
ORP (mv)	-11
TDS (g/L)	1.06

HACH TEST KITS	
Alkalinity (g/g)	220
Carbon Dioxide (mg/L)	66.8
Ferrous Iron (mg/L)	0.2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	7.85

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-14B

Manual Entry:

Well Diameter: inches

Samplers: Dan Chamberland

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 6.1

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/18/2015

Time: (hhmm) 10:45

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
10:45	6.10	200	0.0	7.85	10.11	76.7	0.366	16.51	0.287	-78	
10:55	6.24	200	0.5	7.27	0.36	223	0.557	14.56	0.356	-183	
11:05	6.26	200	1.0	7.25	3.11	69.6	0.531	14.25	0.340	-211	Water
11:15	6.25	200	1.5	7.26	4.90	39.9	0.521	14.25	0.333	-227	Turning
11:20	6.24	200	1.7	7.24	5.45	30.3	0.520	14.27	0.333	-230	Black
11:25	6.23	200	1.9	7.22	5.97	24.6	0.520	14.29	0.333	-234	
11:30	6.24	200	2.2	7.22	5.81	18.3	0.520	14.31	0.332	-235	
11:35	6.24	200	2.4	7.21	5.72	11.8	0.519	14.32	0.332	-237	
11:40	6.23	200	2.6	7.19	5.72	7.8	0.519	14.35	0.332	-239	
11:45	6.22	200	2.8	7.18	5.73	5.1	0.518	14.38	0.331	-241	

Method: Dedicated tubing

Date: 11/18/2015

Time: (hhmm) 11:45

Total Volume of Water Purged: 2.8 (gal)

STABILIZED PARAMETERS

pH	7.18
Spec. Cond.(mS/cm)	0.518
Turbidity (NTU)	5.1
DO (mg/L)	err
Temp.(°C)	14.38
ORP (mv)	-241
TDS (g/L)	0.331

HACH TEST KITS

Alkalinity (g/g)	70
Carbon Dioxide (mg/L)	54
Ferrous Iron (mg/L)	0.2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.7
DTW (ft)	6.22

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-16A

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 3.33

Depth to Well Bottom (ft): 19.45

Purging Data

Method: Low flow

Date: 11/19/2015

Time: 14:40 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
14:40	3.33	100	0	5.34	6.91	9.68	1.5	15.03	.957	162	Clear
14:50	5.53	100	0.15	6.13	5.01	2.51	1.49	15.17	.953	91	
15:05	7.15	100	0.4	6.29	4.41	2.38	1.48	15.27	.948	90	
15:20	9	100	0.7	6.35	4.80	1.63	2.95	15.28	1.89	102	Clear
15:30	10.2	100	0.9	6.37	4.63	1.53	2.94	15.27	1.88	108	
15:40	11.60	100	1.25	6.37	4.72	2.90	2.94	15.23	1.88	114	
15:50	12.75	100	1.6	6.38	4.68	1.96	2.94	15.13	1.88	118	
16:00	13.90	100	2	6.36	4.71	1.92	2.94	15.06	1.88	121	Clear
16:04	-	500	-	-	-	-	-	-	-	-	Dry

Method: Dedicated tubing

Date: 11/20/2015

Time: *(hhmm)* 14:50

Total Volume of Water Purged: 2.5 (gal)

STABILIZED PARAMETERS	
pH	
Spec. Cond.(mS/cm)	
Turbidity (NTU)	
DO (mg/L)	
Temp.(°C)	
ORP (mv)	
TDS (g/L)	

HACH TEST KITS	
Alkalinity (g/g)	175
Carbon Dioxide (mg/L)	250
Ferrous Iron (mg/L)	0.2
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	13.2

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

Purged dry on 11-19-2015.

DTW on 11-20-15 = 13.2
Sampled on 11-20-2015.

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-16B

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 4.3

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/20/2015

Time: 9:30 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
9:30	4.3	200	0	5.27	8.41	88.3	1.60	12	1.03	-102	
9:45	4.55	200	1	5.76	9.35	27.5	1.61	12.1	1.03	-306	
9:55	4.65	200	1.75	5.77	9.02	0	1.6	12.3	1.02	-315	
10:05	4.5	200	2.5	5.77	9.1	0	1.6	11.79	1.02	-319	
10:10	4.5	200	2.7	5.77	9.04	0	1.6	11.85	1.02	-319	
10:15	4.5	200	3	5.77	9.03	0	1.61	11.88	1.03	-320	

Method: Dedicated tubing

Date: 11/20/2015

Time: *(hhmm)* 10:15

Total Volume of Water Purged: 3 (gal)

STABILIZED PARAMETERS

pH	5.77
Spec. Cond.(mS/cm)	1.61
Turbidity (NTU)	0
DO (mg/L)	9.03
Temp.(°C)	11.88
ORP (mv)	-320
TDS (g/L)	1.03

HACH TEST KITS

Alkalinity (g/g)	640
Carbon Dioxide (mg/L)	574
Ferrous Iron (mg/L)	0.4
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	5
DTW (ft)	4.5

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-17A

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 4.09

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/18/2015

Time: 9:00 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
9:05	4.09	150	0	5.35	5.79	35.3	1.22	13.54	.777	29	
9:15	4.28	150	.4	6.60	3.94	29.7	1.20	14.53	.765	-70	
9:25	4.32	150	.6	6.72	3.70	22.4	1.2	14.82	.767	-77	
9:35	4.31	150	.75	6.80	3.54	17.7	1.19	15.01	.759	-84	
9:45	4.30	150	1.1	6.87	3.28	15.7	1.17	15.38	.751	-87	
9:55	4.3	150	1.5	6.88	3.14	18.4	1.17	15.62	.746	-89	
10:00	4.3	150	1.75	6.89	3.11	13	1.16	15.64	.745	-89	
10:05	4.3	150	2.1	6.89	3.08	11	1.16	15.71	.744	-90	

Method: Dedicated tubing

Date: 11/18/2015

Time: *(hhmm)* 10:05

Total Volume of Water Purged: 2.1 (gal)

STABILIZED PARAMETERS

pH	6.89
Spec. Cond.(mS/cm)	1.16
Turbidity (NTU)	11
DO (mg/L)	3.08
Temp.(°C)	15.71
ORP (mv)	-90
TDS (g/L)	.744

HACH TEST KITS

Alkalinity (g/g)	460
Carbon Dioxide (mg/L)	184
Ferrous Iron (mg/L)	1.4
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	4.3

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

Replacement form submitted in the office using iPad screenshots.

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-17B

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 5.25

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/18/2015

Time: 11:10 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
11:15	5.60	250	0	6.38	3.67	33.1	2.01	15.71	1.29	-70	
11:25	5.65	250	.4	6.07	3.17	37.5	2.04	15.79	1.3	-83	
11:35	5.70	250	.8	6.03	3.03	39.6	2.1	15.96	1.34	-101	
11:45	5.7	210	1.2	6.07	2.99	32.6	2.17	16.1	1.39	-129	
11:55	5.7	210	1.7	6.07	3	38.7	2.18	15.98	1.39	-138	
12:00	5.7	210	2	6.07	3.05	31.6	2.19	15.95	1.4	-143	
12:05	5.7	210	2.2	6.05	3.09	35.4	2.2	15.97	1.41	-146	

Method: Dedicated tubing

Date: 11/18/2015

Time: *(hhmm)* 12:05

Total Volume of Water Purged: 2.2 (gal)

STABILIZED PARAMETERS	
pH	6.05
Spec. Cond.(mS/cm)	2.2
Turbidity (NTU)	35.4
DO (mg/L)	3.09
Temp.(°C)	15.97
ORP (mv)	-146
TDS (g/L)	1.41

HACH TEST KITS	
Alkalinity (g/g)	840
Carbon Dioxide (mg/L)	754
Ferrous Iron (mg/L)	2.1
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.2
DTW (ft)	5.7

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

Replacement form submitted in the office using iPad screenshots.

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PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-18A

Manual Entry:

Well Diameter: inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 5.4

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/18/2015

Time: 12:30 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
12:30	5.40	200	0.0	7.29	3.71	245	0.427	15.79	0.278	-68	
12:40	5.92	200	0.5	7.10	3.18	57.5	0.426	15.90	0.277	-80	
12:50	6.03	200	1.0	7.09	2.69	4.93	0.426	16.04	0.277	-90	
13:00	6.17	200	1.5	7.10	2.26	1.5	0.423	16.09	0.275	-95	
13:05	6.20	200	1.7	7.09	1.99	4.1	0.422	16.14	0.275	-98	
13:10	6.25	200	1.9	7.08	1.73	3.7	0.422	16.19	0.274	-101	
13:15	6.28	200	2.1	7.07	1.46	2.0	0.422	16.23	0.275	-102	
13:20	6.31	200	2.4	7.07	1.39	2.4	0.423	16.27	0.275	-103	
13:25	6.32	200	2.6	7.07	1.18	3.0	0.424	16.31	0.275	-104	
13:30	6.33	200	2.8	7.06	0.93	3.5	0.424	16.35	0.275	-105	
13:35	6.35	200	3.1	7.06	0.88	1.6	0.424	16.37	0.276	-105	
13:40	6.37	200	3.3	7.06	0.83	0.8	0.424	16.39	0.276	-106	
13:45	6.38	200	3.6	7.07	0.80	1.0	0.425	16.46	0.275	-106	

Method: Dedicated tubing

Date: 11/18/2015

Time: *(hhmm)* 13:45

Total Volume of Water Purged: 3.6 (gal)

STABILIZED PARAMETERS	
pH	7.07
Spec. Cond.(mS/cm)	0.425
Turbidity (NTU)	1
DO (mg/L)	err
Temp.(°C)	16.46
ORP (mv)	-106
TDS (g/L)	0.275

HACH TEST KITS	
Alkalinity (g/g)	87.5
Carbon Dioxide (mg/L)	67
Ferrous Iron (mg/L)	1.6
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	6.38

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-18B

Manual Entry:

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 5.7

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/18/2015

Time: (hhmm) 14:40

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
14:40	5.70	200	0.0	7.81	2.67	133	0.235	17.25	0.171	-42	
14:50	6.45	200	0.5	6.08	0.0	50.8	0.480	15.95	0.313	-61	
15:00	6.46	200	1.0	6.10	0.00	44.3	0.525	15.94	0.339	-72	
15:10	6.47	200	1.5	6.11	0.0	37.5	0.575	15.79	0.369	-80	
15:15	6.47	200	1.7	6.12	0.0	41.0	0.590	15.75	0.379	-83	
15:20	6.48	200	2.0	6.13	0.0	40.6	0.607	15.72	0.389	-85	
15:25	6.49	200	2.2	6.13	0.0	31.6	0.608	15.69	0.389	-87	
15:30	6.50	200	2.4	6.14	0.0	20.9	0.610	15.65	0.390	-90	

Method: Dedicated tubing

Date: 11/18/2015

Time: (hhmm) 15:30

Total Volume of Water Purged: 2.4 (gal)

STABILIZED PARAMETERS	
pH	6.14
Spec. Cond.(mS/cm)	0.610
Turbidity (NTU)	20.9
DO (mg/L)	0.0
Temp.(°C)	15.65
ORP (mv)	-90
TDS (g/L)	0.390

HACH TEST KITS	
Alkalinity (g/g)	157.5
Carbon Dioxide (mg/L)	234
Ferrous Iron (mg/L)	3.4
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	1
DTW (ft)	6.5

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☑	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☑			353.2/354.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
BOD	☑	500 mL plastic	None	5120B
COD	☑	120 mL plastic	H2SO4	410.4
Dissolved Iron	☑	500 mL plastic	None	6010B
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

Voas effervescing.

Parsons PLUS envision more

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Well ID: MW-19B

Manual Entry:

Samplers: Select...

Well Diameter: 2 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 6.45

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 11/17/2015

Time: 9:15 *(hhmm)*

1-inch=0.041	1.5-inch=0.092	2-inch=0.16	3-inch=0.36
4-inch=0.64	6-inch=1.4	8-inch=2.5	10-inch=4

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	pH	DO (mg/L)	Turbidity (NTU)	Spec Cond (mS/cm)	Temp (°C)	TDS (g/L)	ORP (mV)	Comments
9:20	6.45	250	0	5.63	7.07	1.09	.445	11.01	.289	268	
9:30	6.5	250	.4	6.54	4.94	1.98	.442	12.39	.288	226	
9:40	6.5	250	1	6.81	4.16	.61	.443	13.23	.288	199	
9:50	6.5	250	1.5	6.87	3.85	1.12	.456	13.72	.297	-16	Clear
9:55	6.5	250	2	6.94	3.76	.76	.767	13.82	.358	-50	
10:10	6.5	250	2.6	6.98	3.51	.77	.770	14.18	.495	-117	
10:15	6.5	250	2.8	6.99	3.44	.79	.887	14.29	.544	-125	
10:20	6.5	250	3	6.99	3.43	.81	.895	14.37	.575	-129	
10:25	6.5	250	3.2	6.98	3.37	1.29	.938	14.46	.603	-133	Clear

Method: Dedicated tubing

Date: 11/17/2015

Time: *(hhmm)* 10:25

Total Volume of Water Purged: 3.2 (gal)

STABILIZED PARAMETERS	
pH	6.98
Spec. Cond.(mS/cm)	.938
Turbidity (NTU)	1.29
DO (mg/L)	3.37
Temp.(°C)	14.46
ORP (mv)	-133
TDS (g/L)	.603

HACH TEST KITS	
Alkalinity (g/g)	260
Carbon Dioxide (mg/L)	102.6
Ferrous Iron (mg/L)	0
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	4
DTW (ft)	6.5

* NOTE * HACH test kits are only required for MNA analysis wells.

SAMPLE SET

Parameter		Bottle	Pres.	Method
Select VOCs	☑	3-40mL glass vial	HCl	EPA 8260
MEE/Propane	☐	2-40mL glass vial	HCl	RSK SOP-175
Nitrate/Nitrite	☐			353.2/354.1
Chloride/Sulfate	☐	2-40mL glass vial	HCl	300.1
TOC	☐	2-40mL amber glass vial	H3PO4	5310C
BOD	☐	500 mL plastic	None	5120B
COD	☐	120 mL plastic	H2SO4	410.4
Dissolved Iron	☐	500 mL plastic	None	6010B
Sulfide	☐	1-250 mL glass (field filtered)	NaOH/Zn Acetate	SM-4500-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0

Ms/MSD collected.

Parsons PLUS envision more

PARSONS

APPENDIX D
SITE ANALYTICAL DATA

HYDE PARK FACILITY

Well Id: **MW-1A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
04/2008	5 U	5 U	5 U	5 U	5 U	2 U	1 U	1 U	2.6	5 U	5 U	5 U		2 U	6.02	1.53	112	109	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1 U	1 U	1 U	30	0.8 U	1 U	1 U	2.99 J	1.7 U	16.5 J	2	140 J	141	0.054 U	R	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-1B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	11	5 U	5 U	16	0.36 J	0.97 J	160	5 U	5 U	5 U		2 U	5 UJ	4.23	97.6	301	1 U		
04/2008	5 U	5 U	1.2 J	5 U	5 U	1.9 J	1 U	1 U	64	5 U	0.71 J	5 U		2 U	13	4.06	70	181	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	1.3 J	0.8 U	0.8 U	1.7 J	1 U	1 U	59	0.8 U	1 U	1 U	1.52 J	1.6 U	32.5 J	4.5	71.8 J	218	0.054 U	R	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-2A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	0.91 J	9.8	5 U	5 U	1.9 J				5 U	7.1	4.9 J									
04/2008	5 U	5 U	0.38 J	5 U	2.4 J	2 U				2 J	14	1.2 J									
10/2009	0.8 U	1 U	0.8 U	0.8 U	6	1.3 J				7.6	26	1.2 J									
05/2010	0.8 U	1 U	0.8 U	0.8 U	4.3 J	1.2 J	1 U	1 U	30	4.9 J	18	1.7 J									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-2B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	5 U	48	5 U	5 U	59				5 U	5 U	5 U									
04/2008	5 U	5 U	41	5 U	5 U	62				5 U	5 U	5 U									
10/2009	0.8 U	1 U	9.1	0.8 U	0.8 U	16				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	3.7 J	0.8 U	0.8 U	7.6	1.9 J	55	2300	0.8 U	1 U	1 U									
10/2011	0.8 U	1 U	1.8 J	0.8 U	0.8 U	2.6 J				0.8 U	1 U	1 U									
06/2012	0.8 U	1 U	2.7 J	0.8 U	0.8 U	8.6				0.8 U	1 U	1 U									
08/2013	0.8 U	1 U	2.3 J	0.8 U	0.8 U	4 J				0.8 U	1 U	1 U									
04/2014	0.5 U	0.5 U	1	0.72 J	0.5 U	2.2				0.5 UJ	0.92 J	0.5 U									
11/2015	0.5 U	0.5 U	0.87 J	0.56 J	0.5 U	3.4				0.5 U	0.65 J	0.5 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-3A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	0.9 J	5 U	5 U	2 U	0.54 J	1 U	6	5 U	5 U	5 U		2 U	19 J	3.21	16.4	319	3.64		
04/2008	5 U	0.21 J	0.71 J	5 U	5 U	2 U	1 U	1 U	12	5 U	5 U	5 U		2 U	6.92	2.89	17.5 U	292	1 U	0.5 U	0.05 U
08/2008	0.8 U	1 U	0.89 J	0.8 U	0.8 U	1 U	1 U	1 U	25	0.8 U	1 U					2.6	17.6	318			
10/2008	0.8 U	1.9 J	11	0.8 U	0.8 U	1 U	1 U	1 U	19 J	0.8 U	1 U	1 U				2.3	19.4 J	347			
12/2008	0.8 U	1.4 J	0.8 U	0.8 U	0.8 U	1 U	1 U	1 U	7.7 J	0.8 U	1 U	1 U				4.9	23.3	444			
01/2009	0.8 U	1 U	1 J	0.8 U	0.8 U	1 U	1 U	1 U	7.3 J	0.8 U	1 U	1 U									
03/2009	0.8 U	1 U	0.99 J	0.8 U	0.8 U	1 U	1 U	1 U	5 J	0.8 U	1 U	1 U				3.7	27.3	334			
10/2009	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1 U	1 U	1 U	14 J	0.8 U	1 U	1 U	0.583 J	1.9 U	25.6 J	2.2	15.9 J	250	0.054 U	R	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-3B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloroethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	1.9 J	5 U	5 U	2.2	1 U	1 U	220	5 U	5 U	5 U		2 U	5 UJ	3.19	134	395	1 U		
04/2008	5 U	5 U	2.1 J	5 U	5 U	2.2	0.6 J	1 U	180	5 U	5 U	5 U		4.17	14.1	3.64	132	333	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	1.5 J	0.8 U	0.8 U	2.9 J	1 U	1 U	170	0.8 U	1 U	1 U	0.0736 J	2.2 U	16.5 J	3.8	121 J	254	0.9	R	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-4A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	34	200	3.2 J	1.8 J	56	0.55 J	5.6	130	5 U	12	5 U		2 U	5 UJ	1.87	106	242	1 U		
04/2008	5 U	34	200	3.1 J	1.6 J	53	0.55 J	5.6	130	5 U	15	5 U		2 U	6.62	1.52	117	231	1 U	0.5 U	0.05 U
11/2009	0.8 U	130	110	5.7	2.5 J	41	1 U	4.6 J	83	0.8 U	17	1 U	0.752	2.6 U	12.8 U	1.7 J	97.1	244	0.054 U	0.04 U	0.015 U
05/2010	0.8 U	94	250	4.9 J	2.6 J	45	1 U	5.7	110	0.8 U	21	1 U	0.581	2.1 U	12.8 U	1.8	109	249	0.054 U	0.04 U	0.015 U
10/2011	0.8 U	160	150	8.1	3.8 J	73	1 U	12	170	0.8 U	18	1 U	0.0146 J	3.1 U	12.8 U	2.1	95.9 J	263 J	0.054 U	0.04 U	0.015 U
03/2012	8 UJ	65 J	97 J	9.5 J	8 UJ	14 J	5.7	20	1200	8 UJ	18 J	10 UJ	0.0523 J			999	160	46.3			
06/2012	0.8 U	7.5	140	2.9 J	0.81 J	20	1 U	3.9 J	3700	0.8 U	5.4	7.8	3.22	796	1350	434	89.8	1.5 U	0.34	0.04 U	0.015 U
11/2012	0.8 U	5.5	120	4.2 J	0.92 J	39	3 U	48	7900	0.8 U	3.6 J	21	4.85			397	37.8	1.5 U			
09/2013	0.8 U	4.2 J	31	3.5 J	0.8 U	11	1.4 J	60 J	11000	0.8 U	1.3 J	17	64.4	551 J	1040 J	251	82.9	1.6 J	0.074 J	0.04 UJ	0.015 U
01/2014	0.8 U	1.1 J	7.5	2.4 J	0.8 U	7.2	5 U	65	22000	0.8 U	1 U	12	39.4			362	87.3	1.5 U	0.054 U		
04/2014	0.5 U	1.2	3.7	2.1	0.5 U	4.1	4.2 J	47	25000	0.5 U	0.5 U	12	36.2	342	640	205	99	1.5 U	0.17	0.04 UJ	0.018 J
10/2014	0.5 U	0.57 J	5.3	2.2	0.5 U	5.8	3.5 J	56	19000 J	0.5 UJ	1.1	9.1	57.6			159	83.8	2.5 J	0.054 U		
11/2015	0.5 U	1.2	1.3	0.5 U	0.5 U	1.1	5.2	18	17000	0.5 U	1	3	14.5	70.6	443	36.6	123	5.6	0.085 J	0.04 U	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-4B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	23	5 U	5 U	11	0.39 J	0.39 J	200	5 U	1.4 J	5 U		2 U	5.52 J	3.15	152	316	2.59		
04/2008	5 U	5 U	12	5 U	5 U	13	0.43 J	0.66 J	260	5 U	5 U	5 U		2 U	8.98	3.29	152	247	1 U	0.5 U	0.05 U
11/2009	0.8 U	1 U	9.7	0.8 U	0.8 U	9.5	1 U	1 U	140	0.8 U	1 U	1 U	0.413	3 U	25.6 J	2.9 J	190	267	0.16 J	0.04 U	0.015 U
05/2010	0.8 U	1 U	2.8 J	0.8 U	0.8 U	12	1 U	1 U	160	0.8 U	1 U	1 U	0.0836 J	2.7 U	13.3 J	3.4	165	305	0.054 U	0.04 U	0.015 U
01/2014	0.8 U	1 U	11	0.8 U	0.8 U	15	1 U	2.8 J	150	0.8 U	1.1 J	1 U	0.459			3.9	142	298 J+	0.054 U		

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-5A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	0.59 J	2.6 J	5 U	5 U	2 U	1 U	1 U	0.74 J	5 U	5 U	5 U		2 U	5 UJ	1.14	569	172	1 U		
04/2008	5 U	0.47 J	37	0.35 J	5 U	16	2	4.7	22	5 U	5 U	5 U		2 U	12.2	1.44	542	164	1 U	0.613	0.05 U
10/2009	0.8 U	1 U	5.9	0.8 U	0.8 U	1.8 J	1 U	1 U	5.5 J	0.8 U	1 U	2 U	0.137 J	1.7 U	23.3 J	1.1	263	148 J	0.054 U	0.85	0.015 U
05/2010	0.8 U	1 U	110	0.97 J	0.8 U	84	1.8 J	45	100	0.8 U	1 U	1 U	0.0522 U	1.6 U	15.6 J	1.3	188	126	0.054 U	0.7	0.015 U
10/2011	0.8 U	1 U	5.7	0.8 U	0.8 U	3.3 J	1 U	1.5 J	9.6 J	0.8 U	1 U	1 U	0.0265 J	3.1 U	12.8 U	1.5	204	164	0.054 U	0.75	0.015 U
06/2012	0.8 U	1 U	88	1 J	0.8 U	82	2.8 J	34	130	0.8 U	1 U	1 J	0.0141 U	3.2 U	12.8 U	0.98 J	120	116	0.054 U	0.57	0.015 U
08/2013	0.8 U	1 U	110	1.4 J	0.8 U	190	9.5	100	460	0.8 U	1.3 J	1 U	0.043 U	4.3 U	12.8 U	1.2	106 J	91.7	0.054 U	0.35	0.015 U
04/2014	0.5 U	0.5 U	240	2.3	0.5 U	300	16	110	1100	0.5 UJ	3.3	2.1	0.043 U	4.1 U	12.8 U	2.3	128 J-	63.3 J+	0.054 U	0.13	0.015 U
11/2015	0.5 U	0.5 U	150	1.6	0.5 U	140	5.4	39	2000	0.5 U	1.4	1.5	0.0333 U	6 U	12.8 U	0.5 U	102	102	0.054 U	0.61	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-5B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	0.76 J	61	0.66 J	5 U	49	1 U	0.6 J	86	5 U	0.38 J	5 U		2 U	5 UJ	4.26	83.2	230	1 U		
04/2008	5 U	0.51 J	58	0.5 J	5 U	57	0.37 J	0.76 J	80	5 U	5 U	5 U		2 U	9.57	4.49	81	223	1.94	0.5 U	0.05 U
10/2009	0.8 U	1 U	39	0.8 U	0.8 U	37	1 U	1 U	50	0.8 U	1 U	2 U	0.743	1.7 U	14.2 J	4.9	112	229 J	0.054 U	0.04 U	0.015 U
05/2010	0.8 U	1.1 J	36	0.8 U	0.8 U	39	1 U	1 U	63	0.8 U	1 U	1 U	0.416	1.2 U	15.6 J	4.7	98.5	234	0.054 U	0.04 U	0.015 U
11/2010	0.8 U	1 U	43	0.8 U	0.8 U	45	1 U	1.1 J	81	0.8 U	1 U	1 U				4.1	111	254			
10/2011	0.8 U	1 U	48	0.8 U	0.8 U	63	1 U	1 U	72	0.8 U	1 U	1 U	0.0196 J	2.5 U	17.9 J	4.9	130	358	0.054 U	0.04 U	0.015 U
06/2012	0.8 U	1 U	33	0.8 U	0.8 U	34	1 U	1 U	50	0.8 U	1 U	1 U	0.0141 U	3.7 U	33.3 J	3.4	187	255	0.054 U	0.04 U	0.015 U
11/2012	0.8 U	1 U	39	0.8 U	0.8 U	44	1 U	1 U	66	0.8 U	1 U	1 U				3	166	267			
08/2013	0.8 U	1 U	32	0.8 U	0.8 U	44	1 U	1 U	41	0.8 U	1 U	1 U	0.696	2.8 U	15.6 J	4.5	119 J	299	0.054 U	0.04 U	0.015 U
04/2014	0.5 U	0.97 J	19	0.5 U	0.5 U	33	1 U	1 U	66	0.5 UJ	0.5 U	0.5 U	0.374 J	4.2 U	12.8 U	5.3	93.1	228	0.054 U	0.04 UJ	0.015 U
11/2015	0.5 U	0.6 J	33	0.5 U	0.5 U	63	1 U	2.4 J	120	0.5 U	0.5 U	0.5 U	0.497	4.8 U	15.2 J	3.1	118	254	0.054 U	0.04 U	0.015 U

Notes:
U - Indicates that the compound was not detected
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September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-6**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	5 U	130	0.52 J	5 U	82				5 U	5 U	5 U									
04/2008	5 U	5 U	150	0.39 J	5 U	100				5 U	5 U	5 U									
10/2009	0.8 U	1 U	85	0.8 U	0.8 U	69				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	39	0.8 U	0.8 U	48	1 U	23	310	0.8 U	1 U	1 U	0.0522 U	3.6 U	22.4 J	3.9	140 J	217	3.4	0.04 U	0.015 U
10/2011	0.8 U	1 U	33	0.8 U	0.8 U	57				0.8 U	1 U	1 U									
06/2012	0.8 U	1 U	30	0.8 U	0.8 U	47				0.8 U	1 U	1 U									
08/2013	0.8 U	1 U	24	0.8 U	0.8 U	42				0.8 U	1 U	1 U									
04/2014	0.5 U	0.5 U	18	0.5 U	0.5 U	39				0.5 U	0.5 U	0.5 U									
11/2015	0.5 U	0.5 U	20	0.5 U	0.5 U	57				0.5 U	0.5 U	0.5 U									

Notes:
U - Indicates that the compound was not detected
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September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-7A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	25 U	36	580	25 U	9 J	60	0.95 J	8.5	10	25 U	80	25 U		2 U	7.97 J	2.74	21	250	1 U		
04/2008	10 U	210	1700	6.1 J	24	130	0.44 J	5.3	8.6	1.3 J	220	10 U		2 U	5.42	2.23	17.3	210	1 U	0.5 U	0.24
08/2008	2 U	270	1800	5.9 J	34	130	1 U	7.2	21	4.1 J	280					3.2	22.3	282			
10/2008	0.8 U	58	1800	3.5 J	25	210	1 U	12	21 J	0.8 U	250	1 U				143	21.3 J	60.4			
12/2008	1.6 U	4.3 J	1100	1.7 J	9.6 J	180	1 U	27	24	1.6 U	150	2 U				25.1	24.1	295			
01/2009	0.8 U	3.2 J	840	2.4 J	7.6	390	1 U	51	110	0.8 U	230	1 U									
03/2009	0.8 U	2.9 J	620	1.5 J	3.6 J	250	1 U	69	210	0.8 U	140	1 U				8.8	25	253			
10/2009	0.8 U	2.7 J	120	0.8 U	0.8 U	240	2 U	110	760	0.8 U	56	1 U	2.68	4.2 U	23.3 J	4.7	21.1	228	2.2	0.04 U	0.015 U
11/2009																1150					
12/2009	0.8 U	1 U	140	0.8 U	0.8 U	100	5.1	100	1900	0.8 U	47	1 U				207	23.3 J	56.2 J			
02/2010	0.8 U	1 U	77	0.8 U	0.8 U	84	1.1 J	92	1200	0.8 U	48	1 U				40.1 J	24.1	87.6			
04/2010	0.8 U	1 U	22	0.8 U	0.8 U	49				0.8 UJ	39	1 U									
05/2010	0.8 U	1 U	65	0.8 U	0.8 U	50	1 U	1 U	5 U	0.8 U	33	1 U				95.5	20.9 J	52.2 J			
11/2010	0.8 U	1 U	44	0.8 U	0.8 U	18	43 J	65 J	16000	0.8 U	15	23				261	26.7	31.8			
10/2011	0.8 U	1 U	20	0.8 U	0.8 U	19	57	25	20000	0.8 U	22	13	0.115 J			25.1	28.7	57.1			
03/2012	4 U	5 U	11 J	4 U	4 U	5 U	20	8	6700	4 U	18 J	15 J	4.09			1380	34.3	5			
06/2012	0.8 U	1.2 J	3.8 J	0.8 U	0.8 U	1 U	5.8	3.3 J	6300	0.8 U	9.1	22	3.6			573	24.3	1.5 U			
11/2012	0.8 U	1 U	2.7 J	0.8 U	0.8 U	1.3 J	10	1.1 J	16000	0.8 U	13	16	0.691			204	26.2	5.7			
08/2013	0.8 U	1 U	3.9 J	0.8 U	0.8 U	2.2 J	11	3.5 J	13000	0.8 U	15	7.8	10.3	277 J	576	151	26	8.7	0.16 J	0.04 U	0.015 U
01/2014	0.8 U	1 U	4 J	0.8 U	0.8 U	1.8 J	8.4	2.7 J	17000	0.8 U	16	13	39.4			1340	50.4 J+	1.5 U	0.34		
04/2014	0.5 U	0.5 U	3	0.5 U	0.5 U	1	6.3	1.2 J	20000	0.5 U	12	16	22.9	589	1250	453	25.5	2.3 J	0.067 J	0.04 U	0.015 U
10/2014	0.5 U	0.5 U	0.92 J	0.5 U	0.5 U	0.94 J	4.7 J	1 U	16000	0.5 U	8.1	11	14.1			132	27.9	4 J	0.11 J		
11/2015	0.5 U	0.5 U	1.5	0.5 U	0.5 U	3.1	2.8 J	1.1 J	5900	0.5 U	11	4.8	7.85	99.3	293 J-	84.3	24.6	20.2	0.22	0.04 U	0.015 U

Notes:
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September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-7B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	5 U	11	5 U	5 U	31	0.31 J	1.9	220	5 U	5 U	5 U		2 U	6.58 J	3.41	157	298	1 U		
04/2008	5 U	5 U	10	5 U	5 U	45	0.44 J	2.8	230	5 U	5 U	5 U		2 U	11.6	3.45	130	278	1 U	0.5 U	0.05 U
10/2008	0.8 UJ	1 UJ	19 J	0.8 UJ	0.8 UJ	29 J	1 U	3.1 J	220 J	0.8 UJ	1 UJ	1 UJ				5	164 J	271			
12/2008	0.8 U	1 U	21	0.8 U	0.8 U	33	1 U	4.1 J	250	0.8 U	1 U	1 U				9	153	384			
01/2009	0.8 U	1 U	13	0.8 U	0.8 U	29	1 U	3.3 J	220	0.8 U	1 U	1 U									
03/2009	0.8 U	1 U	20	0.8 U	0.8 U	30	1 U	2.1 J	150	0.8 U	1 U	1 U				5.3	179	296			
10/2009	0.8 U	1 U	7.1	0.8 U	0.8 U	39	1 U	3.3 J	340	0.8 U	1 U	1 U				6.4	146	250			
12/2009	0.8 U	1 U	7.7	0.8 U	0.8 U	24	1 U	3.6 J	260	0.8 U	1 U	1 U				26.8	171 J	220 J			
02/2010	0.8 U	1 U	3.2 J	0.8 U	0.8 U	21	1 U	6.1	650	0.8 U	1 U	1 U				13.9 J	157	248			
03/2010	0.8 U	1 U	3.8 J	0.8 U	0.8 U	29				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	4.5 J	0.8 U	0.8 U	31	1 U	1 U	5 U	0.8 U	1 U	1 U				60.6	130 J	244 J			
11/2010	0.8 U	1 U	6.7	0.8 U	0.8 U	24	1 U	4.2 J	1200	0.8 U	1 U	1 U				17.5	168	239			
10/2011	0.8 U	1 U	6	0.8 U	0.8 U	25	1 U	3.6 J	3400	0.8 U	1 U	1 U	0.0747 J			8.4	168	218 J			
03/2012	8 U	10 U	8 U	8 U	8 U	11 J	1 U	9.3	4500	8 U	10 U	10 U	0.0443 J			68.1	153	122			
06/2012	0.8 U	1 U	1.6 J	0.8 U	0.8 U	9.2	1 U	7.9	2400	0.8 U	1 U	1 U	0.0141 U			19.3	150	143			
11/2012	0.8 U	1 U	1.5 J	0.8 U	0.8 U	9.5	2 U	11	3300	0.8 U	1 U	1 U	0.0333 U			8.7	173	178			
09/2013	0.8 U	1 U	1.2 J	0.8 U	0.8 U	7.5	1 U	11	6400	0.8 U	1 U	1 U	0.043 U	17.4	95 J	11.5	146 J	139	10.3	0.04 UJ	0.015 U
01/2014	0.8 U	1 U	0.8 U	0.8 U	0.8 U	2 J	3 U	9.4	18000	0.8 U	1 U	1 U	0.043 U			70.1	145	61.7	47.9		
04/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.5	1 U	11	19000	0.5 U	0.5 U	0.5 U	0.043 U	366	772	132	136	117	33.3	0.4 U	0.026 J
10/2014	0.5 U	0.5 U	1.5	0.5 U	0.5 U	8	2.3 U	7	13000	0.5 U	0.5 U	0.5 U	0.0334 U			22.2	164	129	22.6		
11/2015	0.5 U	0.5 U	1.2	0.5 U	0.5 U	6.1	1 U	4.3 J	11000	0.5 U	0.5 U	0.5 U	0.0333 U	22.2	97.8	10.8	189	146	20.4	0.04 U	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-8**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	2.2 J	5 U	5 U	1.8 J				5 U	5 U	5 U									
04/2008	5 U	5 U	2.5 J	5 U	5 U	2.6				5 U	5 U	5 U									
11/2009	0.8 U	1 U	2.1 J	0.8 U	0.8 U	2.6 J				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	2.3 J	0.8 U	0.8 U	2.2 J	1 U	1 U	140	0.8 U	1 U	1 U									
10/2011	0.8 U	1 U	1.9 J	0.8 U	0.8 U	2.1 J				0.8 U	1 U	1 U									
06/2012	0.8 U	1 U	1.6 J	0.8 U	0.8 U	1.1 J				0.8 U	1 U	1 U									
08/2013	0.8 U	1 U	1.7 J	0.8 U	0.8 U	1.8 J				0.8 U	1 U	1 U									
04/2014	0.5 U	0.5 U	1.6	0.5 U	0.5 U	1.5				0.5 U	0.5 U	0.5 U									
11/2015	0.5 U	0.5 U	1.7	0.5 U	0.5 U	1.9				0.5 U	0.5 U	0.5 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-10A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	300	12	0.68 J	67	0.52 J	4.6	19	5 U	4.5 J	5 U		2 U	8.32 J	1.93	815	332	1 U		
04/2008	5 U	5 U	390	10	1.6 J	97	4.4	11	60	5 U	5.8	5 U		2 U	10.1	2.99	884	294	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	400	9.4	1.5 J	140	1 U	10	38	0.8 U	6.4	2 U	2.99	1.8 U	46.2 J	1.6	903	279 J	0.054 U	0.04 U	0.015 U
05/2010	0.8 U	1 U	390	7.6	1.3 J	140	1 U	17	71	0.8 U	5.7	1 U	2.77	1.7 U	38.4 J	1.5	784	250	0.054 U	0.04 U	0.015 U
10/2011	0.8 U	1 U	630	11	1.2 J	250	1 U	29	66	0.8 U	7.7	1 U	0.0808 J	2.8 U	27 J	1.9	770 J	254 J	0.054 U	0.04 U	0.015 U
06/2012	0.8 U	1 U	620	13	1 J	170	1.5 J	43	120	0.8 U	7	1 U	0.0141 U	3.2 U	31 J	0.98 J	621	264	0.054 U	0.04 U	0.015 U
08/2013	0.8 U	1 U	580	9.9	0.8 U	130	1 U	28	130	0.8 U	5.6	1 U	1.69	2.8 UJ	27 J	1.8	481	193	0.054 U	0.04 U	0.015 U
04/2014	0.5 U	0.5 U	560	8	0.6 J	95	1 U	24	170	0.5 UJ	4.4	0.5 U	0.719	3.9 U	17.2 J	2	438 J-	228 J+	0.054 U	0.04 U	0.015 U
11/2015	0.5 U	0.5 U	710	9.1	0.52 J	130	1 U	17	220	0.5 U	5.3	0.5 U	1.81	2.9 U	22.1 J	0.87 J	434	170	0.054 U	0.04 U	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-10B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	0.7 J	220	1.9 J	0.38 J	130	0.43 J	1.5	100	5 U	0.69 J	5 U		2 U	5 UJ	3.81	226	236	1 U		
04/2008	5 U	0.46 J	180	1.3 J	5 U	76	0.48 J	1 J	96	5 U	0.54 J	5 U		2 U	12.7	4.22	87.4	198	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	420	3.1 J	0.8 U	120	1 U	2.7 J	110	0.8 U	1 U	1 U	0.648	2.1 U	16.5 J	3.8	121	239	0.054 U	0.04 U	0.015 U
12/2009	0.8 U	1 U	750	9	0.8 U	260	3 U	12	110	0.8 U	1 U	1 U				4.2	123 J	268 J			
02/2010	0.8 U	1 U	300	4 J	0.8 U	120	1 U	3.7 J	92	0.8 U	1 U	1 U				4.2 J	87.5	253			
03/2010	0.8 U	1 U	270	3.1 J	0.8 U	90				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	220	2 J	0.8 U	83	1 U	1 U	5 U	0.8 U	1 U	1 U	0.591	3.5 U	12.8 U	4.9	89.5 J	244 J	0.071 J	0.04 U	0.015 U
11/2010	0.8 U	1 U	1100	13	1.9 J	200	1.8 J	13	130	0.8 U	1 U	1 U				3.2	272	225			
10/2011	1.6 U	2 U	960	11	1.8 J	180	2.7 J	24	300	1.6 U	2 U	2 U	0.0459 J	3.5 U	13.4 J	3.4	189	259 J	0.054 U	0.04 U	0.015 U
03/2012	0.8 U	1 U	260	3 J	0.8 U	49	1 U	1.2 J	53	0.8 U	1 U	1 U	0.0141 U			3.8	104	245			
06/2012	0.8 U	1 U	280	1.7 J	0.8 U	110	1 U	5.7	120	0.8 U	1 U	1 U	0.0141 U	3.3 U	12.9 J	3.8	141	261	0.054 U	0.04 U	0.015 U
11/2012	0.8 U	1 U	630	5.8	0.8 U	130	1 U	11	160	0.8 U	1 U	1 U	0.0333 U			3	194	265			
08/2013	0.8 U	1 U	230	1.5 J	0.8 U	120	1 U	9.2	220	0.8 U	1 U	1 U	0.475	3.1 UJ	24.7 J	2	156	246	0.054 U	0.04 U	0.015 U
01/2014	0.8 U	1 U	150	0.8 U	0.8 U	25	1 U	1.2 J	23	0.8 U	1 U	1 U	0.073 J			7.6	130	251	0.054 U		
04/2014	0.5 U	0.5 U	190	0.7 J	0.5 U	22	1 U	2.3 J	38	0.5 U	0.5 U	0.5 U	0.076 J	3.2 U	12.8 U	4.8	133	256	0.054 U	0.04 U	0.015 U
10/2014	0.5 U	0.5 U	160	0.5 U	0.5 U	89	1.1 J	210	1000	0.5 UJ	0.5 U	0.5 U	0.0484 J			4.9	130	224	1.3		
11/2015	0.5 U	0.5 U	190	0.68 J	0.5 U	190	2.1 J	190	2900	0.5 U	0.9 J	0.5 U	0.0333 U	6 U	17.5 J	3	145	207	0.71	0.04 U	0.015 U

Notes:
U - Indicates that the compound was not detected
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September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-11A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
04/2008	5 U	5 U	5 U	5 U	5 U	0.7 J				5 U	5 U	5 U									
10/2009	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1 U				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	0.8 U	0.8 U	0.8 U	3.2 J	1 U	1 U	51	0.8 U	1 U	1 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-11B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	140	1 J	5 U	80				5 U	0.39 J	5 U									
04/2008	5 U	5 U	100	0.77 J	5 U	64				5 U	5 U	5 U									
03/2009																3.8					
10/2009	0.8 U	1 U	64	0.8 U	0.8 U	73	1 U	14	170	0.8 U	1 U	1 U	0.0522 U	1.8 U	21 J	3.4	172	221	0.3	0.04 U	0.015 U
12/2009	0.8 U	1 U	5.3	0.8 U	0.8 U	17	1 U	81	190	0.8 U	1 U	1 U				7.4	148 J	221 J			
02/2010	0.8 U	1 U	2.3 J	0.8 U	0.8 U	11	1 U	130	760	0.8 U	1 U	1 U				11.7 J	146	50.2			
03/2010	0.8 U	1 U	2.1 J	0.8 U	0.8 U	7.1				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	1.9 J	0.8 U	0.8 U	7.4	1 U	1 U	5 U	0.8 U	1.3 J	1 U	0.179 J	64.7 J	132	14.1	114 J	101 J	48.3	0.04 U	0.015 U
11/2010	0.8 U	1 U	1.4 J	0.8 U	0.8 U	4.3 J	1 U	57	1100	0.8 U	1.2 J	1 U				3.9	125	208			
10/2011	0.8 U	1 U	2.2 J	0.8 U	0.8 U	4.6 J	1 U	90	1500	0.8 U	1.8 J	1 U	0.0859 J	8.9	31.5 J	3.8	157	245 J	8.5	0.043 J	0.015 U
03/2012	0.8 U	1 U	1.4 J	0.8 U	0.8 U	6.7	1.3 J	72	5200	0.8 U	1.5 J	1 U	0.0711 J			9.5	117	118			
06/2012	0.8 U	1 U	2.1 J	0.8 U	0.8 U	6.1	2.4 J	100	7500	0.8 U	1.3 J	1 U	0.0141 U	25.7	81	4.2	126	130	39.4	0.04 U	0.015 U
11/2012	0.8 U	1 U	0.85 J	0.8 U	0.8 U	2.4 J	3.6 J	110	6800	0.8 U	1.3 J	1 U	0.0333 U			4	143	164			
08/2013	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1.4 J				0.8 U	1.9 J	1 U									
01/2014	0.8 U	1 U	0.8 U	1.1 J	0.8 U	1.2 J	4 J	260	10000	0.8 U	2.5 J	1 U	0.043 U			8	141	120	23.8		
04/2014	0.5 U	0.5 U	0.5 U	0.92 J	0.5 U	1.2	3.5 J	280	8300	0.5 U	2	0.5 U	0.043 U			5.2	141	158	27.8		
10/2014	0.5 U	0.5 U	0.5 U	0.66 J	0.5 U	2.5	1.4 J	86	4200	0.5 UJ	1.2	0.5 U	0.0334 U			5.3	143	160	11.1		
11/2015	0.5 U	0.5 U	0.56 J	0.57 J	0.5 U	1.7				0.5 U	1	0.5 U									

Notes:
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J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-12A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	150	1.3 J	0.49 J	39				5 U	3.2 J	5 U									
04/2008	5 U	5 U	130	1 J	0.32 J	23				5 U	2 J	5 U									
11/2009	0.8 U	1 U	64	0.8 U	0.8 U	38				0.8 U	2.7 J	1 U									
05/2010	0.8 U	1 U	16	0.8 U	0.8 U	16	1 U	14	140	0.8 U	1.6 J	1 U									
10/2011	0.8 U	1 U	19	0.8 U	0.8 U	16				0.8 U	1.8 J	1 U									
06/2012	0.8 U	1 U	19	0.8 U	0.8 U	13				0.8 U	1.8 J	1 U									
08/2013	0.8 U	1 U	22	0.8 U	0.8 U	14	5.6	7.2	210	0.8 U	1.9 J	1 U	34.2	4.4 U	311	5.5	80.7	204	0.054 U	0.04 U	0.015 U
04/2014	0.5 U	0.5 U	8.9	0.5 U	0.5 U	6.8	1 U	2.4 J	140	0.5 U	0.89 J	0.5 U	0.962	4.7 U	15 J	5.6	69	179	0.054 U	0.14 J-	0.015 U
11/2015	0.5 U	0.5 U	1.6	0.5 U	0.5 U	9.6	1 U	1 U	140	0.5 U	0.7 J	0.5 U	2.27	3.8 U	26.7 J	7.7	63.6	119	0.079 J	0.04 U	0.015 U

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-12B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	110	1 J	5 U	76				5 U	1.8 J	5 U									
04/2008	5 U	5 U	140	1.6 J	0.31 J	70				5 U	1.6 J	5 U									
11/2009	0.8 U	1 U	2.6 J	0.8 U	0.8 U	1 U				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	11	0.8 U	0.8 U	1 U	1 U	1 U	5 U	0.8 U	1 U	1 U									
11/2010	0.8 U	1 U	59	0.8 U	0.8 U	71	1.2 J	3.3 J	120	0.8 U	1 U	1 U				3.2	149	312			
10/2011	0.8 U	1 U	0.98 J	0.8 U	0.8 U	1 U				0.8 U	1 U	1 U									
06/2012	0.8 U	1 U	5.6	0.8 U	0.8 U	10				0.8 U	1 U	1 U									
08/2013	0.8 U	1 U	45	0.8 U	0.8 U	70	1 U	15	160	0.8 U	1 U	1 U	0.0822 J	4.2 U	17.9 J	4.1	143	230	0.093 J	0.04 U	0.015 U
04/2014	0.5 U	0.5 U	57	0.5 U	0.5 U	75	1 U	9.7	190	0.5 U	0.5 U	0.5 U	0.043 U	4.1 U	12.8 U	5.4	149	201	0.054 U	0.04 UJ	0.015 U
11/2015	0.5 U	0.5 U	13	0.5 U	0.5 U	9.1	1 U	1 U	25	0.5 U	0.5 U	0.5 U	0.111 J	4.7 U	22.1 J	9.2	148	244	0.054 U	0.2 J+	0.039 J

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-13A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
04/2008	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
10/2009	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1 U				0.8 U	1 U	2 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-13B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	0.78 J	82	1.1 J	5 U	59				5 U	0.61 J	5 U									
04/2008	5 U	0.65 J	65	0.51 J	5 U	56				5 U	0.48 J	5 U									
10/2009	0.8 U	1 U	88	0.8 U	0.8 U	68				0.8 U	1 U	2 U									
05/2010	0.8 U	1 U	46	0.8 U	0.8 U	47	1 U	1 J	65	0.8 U	1 U	1 U									
10/2011	0.8 U	1 U	17	0.8 U	0.8 U	24				0.8 U	1 U	1 U									
06/2012	0.8 U	1 U	27	0.8 U	0.8 U	57				0.8 U	1 U	1 U									
08/2013	0.8 U	1 U	8.6	0.8 U	0.8 U	48				0.8 U	1 U	1 U									
04/2014	0.5 U	0.5 U	19	0.5 U	0.5 U	15				0.5 UJ	0.5 U	0.5 U									
11/2015	0.5 U	0.5 U	18	0.5 U	0.5 U	21				0.5 U	0.5 U	0.5 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-14A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	1.6 J	5 U	5 U	2.4				5 U	5 U	5 U									
04/2008	5 U	5 U	1.5 J	5 U	5 U	1.6 J	0.64 J	1 U	15	5 U	5 U	5 U		2 U	18.8	5.38	68	118	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	1.4 J	0.8 U	0.8 U	2.7 J	1 U	1 U	17	0.8 U	1 U	2 U	5.15	1.4 U	21 J	4.2	63.9	150 J	0.054 U	0.28	0.015 U

Notes:
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J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-14B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	56	0.42 J	5 U	49	2 U	2 U	110	5 U	0.6 J	5 U		2 U	6.58 J	4.07	119	263	1 U		
04/2008	5 U	5 U	120	0.81 J	5 U	90	2.5 U	1.5 J	170	5 U	0.41 J	5 U		2 U	10.1	2.95	136	222	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	64	0.8 U	0.8 U	86	1 U	2.2 J	130	0.8 U	1 U	2 U	0.208	2.1 U	23.3 J	3.5	133	310 J	0.5	0.04 U	0.015 U
05/2010	0.8 U	1 U	16	0.8 U	0.8 U	33	20 U	170	3400	0.8 U	1 U	1 U	0.0522 U	53.6	137	14.6	143	103	46.9	0.04 U	0.015 U
10/2011	0.8 U	1 U	4.1 J	0.8 U	0.8 U	5.4	1 U	66	690	0.8 U	1 U	1 U	0.0264 J	5.2 U	36 J	7	260	274	3	0.04 U	0.015 U
06/2012	0.8 U	1 U	1.5 J	0.8 U	0.8 U	5.4	2.2 J	91	9100	0.8 U	1 U	1 U	0.027 J	33	117	10.2	241	126	48.2	0.04 U	0.015 U
08/2013	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1.5 J				0.8 U	1 U	1 U									
04/2014	0.5 U	0.5 U	0.67 J	0.5 U	0.5 U	1.2				0.5 UJ	0.5 U	0.5 U									
11/2015	0.5 U	0.5 U	0.95 J	0.5 U	0.5 U	1.5				0.5 U	0.53 J	0.5 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-15**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	170	1.7 J	5 U	86				5 U	0.66 J	5 U									
04/2008	5 U	5 U	190	1.5 J	5 U	93				5 U	0.58 J	0.38 J									
11/2009	0.8 U	1 U	56	1.1 J	0.8 U	82				0.8 U	2 J	1 U									
05/2010	0.8 U	1 U	5.9	0.8 U	0.8 U	17	1.1 J	140	1300	0.8 U	1.3 J	1 U									
10/2011	0.8 U	1 U	32	1.3 J	0.8 U	52				0.8 U	1.4 J	1 U									
06/2012	0.8 U	1 U	0.8 U	0.8 U	0.8 U	1.8 J				0.8 U	1.2 J	1 U									
08/2013	0.8 U	1 U	0.8 U	0.8 U	0.8 U	2 J				0.8 U	1 U	1 U									

Notes:
U - Indicates that the compound was not detected
J - Indicates an estimated value.

September 2008: Completion of Overburden Pilot Test Injections
November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-16A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	0.39 J	12	5 U	5 U	160	0.87 J	15	18	5 U	5 U	5 U		2 U	23.2 J	6.93	278	981	1.2		
04/2008	5 U	0.39 J	9	5 U	5 U	53	1 U	0.62 J	4.5	5 U	5 U	5 U		2 U	20.4	6.5	209	1020	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	8.2	0.8 U	0.8 U	75	1 U	4.7 J	11 J	0.8 U	1 U	1 U	0.198 J	1.7 U	41.6 J	7.2	247 J	1060	0.054 U	R	0.015 U
05/2010	0.8 U	1 U	10	0.8 U	0.8 U	180	1 U	20	20	0.8 U	1 U	1 U	0.0522 U	2 U	40.7 J	7	260	1040	0.054 U	0.04 U	0.015 U
10/2011	0.8 U	1 U	11	0.8 U	0.8 U	340	1 U	44	33	0.8 U	1 U	1 U	0.0424 J		31.5 J	6.9	266	1130	0.054 U	0.04 U	0.015 UJ
03/2012	0.8 U	1 U	7.2	0.8 U	0.8 U	12	1 U	1.3 J	5 U	0.8 U	1 U	1 U	0.044 J			8.1	245	1110			
06/2012	0.8 U	1 U	8.4	0.8 U	0.8 U	110	1 U	11	8.7 J	0.8 U	1 U	1 U	0.0141 U	5.4	26.5 J	9.5	237	1100			
11/2012	0.8 U	1 U	10	0.8 U	0.8 U	330	1.2 J	79	40	0.8 U	1 U	1 U	0.0333 U			7.7	255	1100			
08/2013	0.8 U	1 U	8.5	0.8 U	0.8 U	300	1.1 J	72	29	0.8 U	1 U	1 U	0.338	3.8 U	31.5 J	8.2	252	1080	0.054 U	0.04 U	0.015 U
01/2014	0.8 U	1 U	9	0.8 U	0.8 U	78	1 U	6.4	3 U	0.8 U	1 U	1 U	0.043 U			9.5	190 J+	812 J+	0.054 U		
04/2014	0.5 U	0.5 U	5.9	0.5 U	0.5 U	140	1 U	20	3 U	0.5 U	0.5 U	0.5 U	0.043 U	4.4 U	24.1 J	7.3	214	898	0.054 U	0.04 U	0.14
10/2014	0.5 U	0.5 U	8.6	0.5 U	0.5 U	350	1 U	52	9.5	0.5 UJ	0.5 U	0.5 U	0.491			9.1	221	958	0.054 U		
11/2015	0.5 U	0.5 U	9.1	0.5 U	0.5 U	250	1.2 J	95	49	0.5 U	0.5 U	0.5 U	0.0333 U	5.2 U	33.6 J	6.5	290	1080	0.054 U	0.04 U	0.015 U

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HYDE PARK FACILITY

Well Id: **MW-16B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	210	0.88 J	5 U	63	1 U	3.7	190	5 U	5 U	5 U		2 U	5 UJ	3.7	114	269			
11/2007																			1 U		
04/2008	5 U	0.25 J	280	1.4 J	0.33 J	86	0.7 J	3.1	220	5 U	0.22 J	5 U		2 U	10.1	3.81	106	264	1.1	0.5 U	0.05 U
10/2009	0.8 U	1 U	510	1.8 J	0.8 U	130	1 U	3.2 J	150	0.8 U	1 U	1 U	0.469	1.8 U	18.8 J	3.7	120 J	286	0.22	R	0.015 U
05/2010	0.8 U	1 U	80	0.8 U	0.8 U	47	1 U	2.6 J	160	0.8 U	1 U	1 U	0.126 J	2 U	27 J	3.9	107	238	0.25	0.04 U	0.015 U
11/2010	0.8 U	1 U	320	1.4 J	0.8 U	110	2 U	4 U	120	0.8 U	1 U	1 U				3.7	114	264			
10/2011	0.8 U	1 U	27	0.8 U	0.8 U	43	1 U	3.8 J	140	0.8 U	1 U	1 U	0.0141 U	2.6 U	12.8 U	3.5	134 J	303 J	0.38	0.04 U	0.015 U
03/2012	8 U	45 J	9000	36 J	23 J	830	3.1 J	73	2400	8 U	10 U	10 U	0.0585 J			17.5	78.4	96.6			
06/2012	1.6 U	75	4800	19	15	590	2.3 J	70	2300	1.6 U	4.1 J	2.2 J	0.0141 U	21.7	69.7	4.3	81.5	177	29.7	0.04 U	0.015 U
11/2012	8 U	430	6800	24 J	29 J	820	5.6	190	3600	8 U	10 U	10 U	0.0908 J			3.5	82.8	191			
08/2013	0.8 U	2.2 J	600	5.2	2.4 J	610	1 U	75	670	0.8 U	1 J	1 U	0.0637 J	5.1 U	15.6 J	3.8	90.1 J	219	1.1	0.04 U	0.015 U
01/2014	4 U	5 U	8800	53	17 J	5500	15	1500	18000	4 U	15 J	5 U	0.214 J			194	44.8	1.5 U	50.9		
04/2014	2.5 U	2.5 U	2300	16	5.5	2000	11	700	16000	2.5 U	3.4 J	2.5 U	0.0956 J	140	253	69.2	26.9	17.7	38.3	0.04 UJ	0.015 U
10/2014	0.5 U	0.5 U	17	8.8	0.5 U	22	13	610	21000	0.5 U	2.9	0.5 U	0.372 J			211	43.3	21.6	17.2		
11/2015	0.5 U	4.8	1100	22	2.2	780	40	920	24000	0.5 U	6.6	0.5 U	0.0333 U	105	215	47.3	70.6	4.2	36.5	0.04 U	0.015 UJ

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November 2009: Completion of Overburden and Bedrock Injections
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September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-17A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	38	160	1.9 J	10	12	1 U	0.42 J	60	5 U	19	5 U		2 U	11.4 J	2.51	1400	134	1 U		
04/2008	5 U	29	200	1.5 J	9.1	28	1 U	1.5	77	5 U	20	5 U		2 U	11	2.2	1120	153	1 U	0.5 U	0.05 U
08/2008	0.8 U	40	190	2.5 J	11	24	1 U	1.5 J	120	0.8 U	21					2.4	1250	168			
10/2008	0.8 U	43	200	3.5 J	13	23	1 U	1.3 J	120 J	0.8 U	23	1 U				2.2	1270 J	165			
12/2008	0.8 U	39	210	2.2 J	12	27	1 U	1.1 J	65	0.8 U	25	1 U				2.2	1070	161			
01/2009	0.8 U	32	210	2.1 J	11	29	1 U	1.4 J	88	0.8 U	23	1 U									
03/2009	0.8 U	29	210	2.5 J	12	28	1 U	1.4 J	78	0.8 U	20	1 U				2.3	1220	170			
10/2009	0.8 U	24	200	2.2 J	14	24	1 U	1 U	120	0.8 U	29	1 U	3.81 J	1.9 U	59.9 J	3.1	1080 J	198 J	0.054 U	R	0.015 U
12/2009	0.8 U	11	200	1.4 J	13	29	1 U	1 U	100	0.8 U	28	1 U				3.1	1060 J	217 J			
02/2010	0.8 U	14	210	1.3 J	11	34	1 U	1 U	110	0.8 U	24	1 U				3.7 J	962	194			
03/2010	0.8 U	11	180	1.7 J	10	24				0.8 U	20	1 U									
05/2010	0.8 U	15	210	1.4 J	11	27	1 U	1 U	5 U	0.8 U	20	1 U	3.03	3.6 U	29.3 J	2.9	729 J	196 J	0.054 U	0.04 U	0.015 U
11/2010	0.8 U	16	200	1.9 J	13	28	1.5 J	8.5	2100	0.8 U	27	1 U				3.1	661	195			
10/2011	0.8 U	11	160	1.2 J	12	30	11	3.2 J	4900	0.8 U	26	1 U	0.0141 U	5.1	33.8 J	3.9	1010	189	0.054 U	0.04 U	0.015 U
06/2012	0.8 U	5.3	140	1.2 J	8.1	25	12	3.1 J	8500	0.8 U	21	1 U	0.0141 U	5.9	28.8 J	4.4	484	172	0.054 U	0.04 U	0.015 U
08/2013	0.8 U	3.1 J	180	0.8 U	6.3	45	11	8.8	12000	0.8 U	22	1 U	5.86	9.8	27 J	3.8	318 J	151	0.054 U	0.04 U	0.015 U
04/2014	0.5 U	0.62 J	150	0.5 U	3.6	49	14	17	18000	0.5 UJ	16	0.5 U	2.14	8.5	49.3 J	5.1	277	145	0.054 U	0.04 UJ	0.015 U
11/2015	0.5 U	0.5 U	160	0.5 U	0.5 U	86	12	11	15000	0.5 U	18	0.5 U	1.45	7.3	15.2 J	3	167	114	0.054 U	0.04 U	0.015 U

Notes:
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HYDE PARK FACILITY

Well Id: **MW-17B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	4 J	440	3.4 J	3.4 J	64	0.66 J	2.8	180	5 U	9.3	5 U		2 U	9.7 J	3.31	431	209	1 U		
04/2008	5 U	4.6 J	630	8.5	5.5	82	0.53 J	4	160	5 U	17	5 U		2 U	10.4	3.06	475	211	1 U	0.5 U	0.05 U
10/2008	0.8 U	3.3 J	600	5.9	4.4 J	120	1 U	6.6	170 J	0.8 U	22	1 U				55.7	561 J	169			
12/2008	0.8 U	2.6 J	260	3.1 J	2.9 J	170	1 U	33	120	0.8 U	28	1 U				3	802	180			
01/2009	0.8 U	2.1 J	280	4.2 J	3.1 J	210	1 U	61	130	0.8 U	24	1 U									
03/2009	0.8 U	1.6 J	270	3.6 J	3.2 J	180	1 U	71	180	0.8 U	22	1 U				3.5	631	275			
10/2009	0.8 U	4.2 J	280 J	2.4 J	4.5 J	73	3 J	22	120	0.8 U	29	1 U	1.45 J	2.2 U	53.1 J	3	768 J	204 J	0.1 J	R	0.015 U
12/2009	0.8 U	2.2 J	170	2.4 J	0.8 U	160	2.4 J	130	300	0.8 U	8.4	1 U				264	171 J	18.3 J			
02/2010	0.8 U	1.2 J	31	1.8 J	0.8 U	52	4.2 J	190	4400	0.8 U	31	1 U				122 J	727	32.2			
03/2010	0.8 U	1 U	5.9	1.7 J	0.8 U	10				0.8 U	37	1 U									
05/2010	0.8 U	1 U	8.5	1.4 J	0.8 U	9.6	1 U	1 U	5 U	0.8 U	45	1 U	0.248	157 J	219	12.7	883 J	49.7 J	14.3	0.04 U	0.015 U
11/2010	0.8 U	1 U	8.1	0.86 J	0.8 U	8.8	16	110	4200	0.8 U	40	1 U				4.5	981	118			
10/2011	0.8 U	1 U	19	0.82 J	0.8 U	27	70	81	15000	0.8 U	48	1.4 J	0.102 J	5.7	45.1 J	3.2	966	154 J	4.5	0.04 U	0.015 U
03/2012	0.8 U	1 U	14	1.1 J	0.8 U	15	44	83	18000	0.8 U	46	1.3 J	0.0442 J			10.9	682	118			
06/2012	0.8 U	1 U	20	0.82 J	0.8 U	18	45	72	23000	0.8 U	43	1.5 J	0.19 J	9.6	49.2 J	3.8	739	116	11.6	0.04 U	0.015 U
11/2012	0.8 U	1 U	28 J	0.8 U	0.8 U	31	41	79	19000	0.8 U	35 J	1 U	0.172 J			3.2	669	130			
08/2013	0.8 U	1 U	35	0.8 U	0.8 U	40	29	56	19000	0.8 U	38	1 U	0.55	12.7	40.6 J	3.6	521 J	138	1.2	0.04 U	0.015 U
01/2014	0.8 U	1 U	1.8 J	1.5 J	0.8 U	2.9 J	7.2	52	19000	0.8 U	7.9	11	54.8			454	351 J+	1.5 U	6.3		
04/2014	0.5 U	0.5 U	1.3	0.73 J	0.5 U	2.1	13	34	20000	0.5 U	8.2	7.4	16.6	139	228	55.1	288	6.9	8.2 J-	0.04 U	0.016 J
10/2014	0.5 U	0.5 U	0.52 J	0.71 J	0.5 U	1.1	8.3	17	16000	0.5 UJ	3.3	8.2	15.5			38.4	386	1.5 U	4.1		
11/2015	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.8 J	8.5	8.9	14000	0.5 U	1.5	7.9	13.4	17.6	102	18.8	374	2.5 J	1.4	0.04 U	0.015 U

Notes:
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November 2009: Completion of Overburden and Bedrock Injections
November 2011: Overburden Injections Completed
September 2013: Overburden and Bedrock Injections Completed

HYDE PARK FACILITY

Well Id: **MW-18A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	22	25	0.46 J	0.58 J	6.7	0.38 J	1 U	17	5 U	4.1 J	5 U		2 U	5 UJ	1.79	74.2	125	1 U		
04/2008	5 U	25	31	0.44 J	0.8 J	2.1 J	1 U	1 U	16	5 U	3.8 J	5 U		2 U	5 U	1.56	79.6	133	1 U	0.5 U	0.05 U
10/2009	0.8 U	25	43	0.8 U	0.93 J	7	1 U	1 U	23	0.8 U	4.7 J	1 U	1.21	1.4 U	14.2 J	1.5	90.2 J	130	0.054 U	R	0.015 U
05/2010	0.8 U	25	51	0.8 U	1.1 J	2.6 J	1 U	1 U	13 J	0.8 U	4.2 J	1 U	1.2	1.6 U	12.8 U	2.1	104 J	132	0.054 U	0.04 U	0.015 U
10/2011	0.8 U	23	42	0.8 U	0.9 J	8.4	1 U	1 U	19	0.8 U	4.7 J	1 U	0.0478 J	2.1 U	12.8 U	1.8	293	156	0.054 U	0.04 U	0.015 U
06/2012	0.8 U	21	56	0.94 J	1.1 J	2.4 J	1 U	1 U	11 J	0.8 U	4.2 J	1 U	0.0141 U	3.1 U	12.8 U	1	108	129	0.054 U	0.04 U	0.015 U
08/2013	0.8 U	25	58	0.87 J	0.98 J	3.4 J	1 U	1 U	10	0.8 UJ	4.9 J	1 U	1.29	6.2	12.8 U	2.1	118	138	0.054 U	0.04 U	0.015 U
04/2014	0.5 U	27	43	0.76 J	0.9 J	0.86 J	1 U	1 U	3.4 J	0.5 UJ	3.6	0.5 U	0.89	3.3 U	12.8 U	2.4	106 J-	124 J+	0.054 U	0.04 U	0.015 U
11/2015	0.5 U	39	53	0.76 J	1.2	2.8	1 U	1 U	20 J	0.5 U	4.7	0.5 U	1.47	2.9 U	12.8 U	1.3	111	120	0.054 U	0.04 U	0.015 U

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HYDE PARK FACILITY

Well Id: **MW-18B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/2007	5 U	5 U	160	0.9 J	5 U	140		2.1	120	5 U	5 U	5 U		2 U	5 UJ	4.09	80.9	261	1 U		
04/2008	5 U	5 U	120	0.73 J	5 U	180	0.74 J	2.4	150	5 U	5 U	5 U		2 U	9.86	3.74	88.1	270	1 U	0.5 U	0.05 U
10/2009	0.8 U	1 U	62	0.8 U	0.8 U	220	1 U	2.3 J	120	0.8 U	1 U	1 U	0.806	1.7 U	23.3 J	4.1	93.8 J	296	0.054 U	R	0.015 U
05/2010	0.8 U	1 U	69	0.8 U	0.8 U	190	1 U	2.4 J	130	0.8 U	1 U	1 U									
10/2011	0.8 U	1 U	150	0.9 J	0.8 U	220	1 U	4 J	120	0.8 U	1 U	1 U	0.0657 J	2.4 U	12.8 U	3.9	114 J	305 J	0.054 U	0.04 U	0.015 U
03/2012	0.8 U	1 U	59	0.8 U	0.8 U	170	1 U	2.3 J	96	0.8 U	1 U	1 U	0.0423 J			3.5	102	281			
06/2012	0.8 U	1 U	110	0.8 U	0.8 U	140	1 U	3.6 J	110	0.8 U	1 U	1 U	0.0141 U	3.5 U	12.8 U	4	102	268	0.054 U	0.04 U	0.015 U
11/2012	0.8 U	1 U	89	0.8 U	0.8 U	180	1 U	5.2	150	0.8 U	1 U	1 U	0.0333 U			4.2	106	284			
08/2013	0.8 U	1 U	110	0.8 U	0.8 U	190	1 U	5.3	170	0.8 UJ	1 U	1 U	0.812	2.8 U	17.9 J	4.9	106	284	0.054 U	0.04 U	0.015 U
01/2014	0.8 U	1 U	28	0.8 U	0.8 U	56	3.2 J	41	5000	0.8 U	1 U	1 U	5.97			941	91.1	55.1	17.3		
04/2014	0.5 U	0.5 U	43	0.5 U	0.5 U	71	3.8 J	33	13000	0.5 UJ	0.5 U	0.5 U	2.91	889 J	1340	427	79.3 J-	86.1 J+	7.7	0.04 U	0.015 U
10/2014	0.5 U	0.5 U	1.1	0.5 U	0.5 U	4.6	4 J	11	18000	0.5 U	0.5 U	0.5 U	8.37			166	34.9	3.8 J	2.8		
11/2015	0.5 U	0.5 U	35	0.5 U	0.5 U	40	3.5 J	15	18000	0.5 U	0.5 U	0.5 U	2.54	35.7	167	41.5	62.2	70.9	1.5	0.04 U	0.015 U

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HYDE PARK FACILITY

Well Id: **MW-19A**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	4.2 J	5 U	5 U	4				5 U	5 U	5 U									
04/2008	5 U	5 U	3.2 J	5 U	5 U	1.2 J				5 U	5 U	5 U									
11/2009	0.8 U	1 U	3.7 J	0.8 U	0.8 U	2.8 J				0.8 U	1 U	1 U									

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HYDE PARK FACILITY

Well Id: **MW-19B**

Date	(PCE) (ug/L)	(TCE) (ug/L)	Cis-1,2-DCE (ug/L)	Trans-1,2-DCE	1,1-DCE (ug/L)	Vinyl chloride (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1-Dichloro-ethane (ug/L)	Chloroethane (ug/L)	Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/2007	5 U	5 U	12	5 U	5 U	3.4				5 U	5 U	5 U									
04/2008	5 U	5 U	24	5 U	5 U	5.8				5 U	5 U	5 U									
11/2009	0.8 U	1 U	68	0.8 U	0.8 U	7.2				0.8 U	1 U	1 U									
05/2010	0.8 U	1 U	2.1 J	0.8 U	0.8 U	2.1 J	1 U	1 U	160	0.8 U	1 U	1 U									
10/2011	0.8 U	1 U	8.7	0.8 U	0.8 U	3.3 J				0.8 U	1 U	1 U									
06/2012	0.8 U	1 U	2.3 J	0.8 U	0.8 U	1.6 J				0.8 U	1 U	1 U									
08/2013	0.8 U	1 U	2.1 J	0.8 U	0.8 U	1.2 J				0.8 U	1 U	1 U									
04/2014	0.5 U	0.5 U	2.9	0.5 U	0.5 U	0.65 J				0.5 U	0.5 U	0.5 U									
11/2015	0.5 U	0.5 U	1.8	0.5 U	0.5 U	1				0.5 U	0.5 U	0.5 U									

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