TWELVE-MONTH SUMMARY REPORT

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

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Houston, Texas 77079

PREPARED BY:

PARSONS

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MAY 2015

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May 5, 2015

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
Twelve-Month Data Summary Report

Dear Mr. Hinton:

Enclosed is the Twelve-Month Data Summary Report, containing results of sampling conducted in January, April, and October 2014, following a bioremediation injection event in September 2013. 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)

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EXECUTIVE SUMMARY

The purpose of this twelve-month report is to present the results of the 12-month performance monitoring, review the results of previous performance monitoring events, determine if the goals of the 2013 bioremediation injections were successful, and evaluate whether the primary objective of reducing chlorinated volatile organic compound (CVOC) concentrations at the former Carborundum Hyde Park facility (Site) through bioremediation injections has been met.

Prior to the first bioremediation injections, declining CVOC concentration trends were observed at the site. Natural biodegradation was indicated based on anaerobic groundwater conditions and the presence of trichloroethene (TCE) biodegradation products, 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 185 µg/L, respectively, relative to pre-bioremediation concentrations. In addition, a mass discharge analysis indicated that the remediation has significantly reduced CVOC migration. Comparing before and after remediation, there has been an approximate 95 percent decrease in CVOC migration from the overburden area, and an approximate 95 percent decrease in CVOC migration from the bedrock high concentration area. 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 and mass discharge reductions, is expected to attenuate the remaining concentrations of CVOCs.

INTRODUCTION

Enhanced *in situ* bioremediation using emulsified vegetable oil (EVO) substrate injections was selected as a treatment for impacted groundwater at the former Carborundum Hyde Park facility in the Town of Niagara, New York. Previous substrate injection events were conducted in September 2008 (overburden), November 2009 (overburden and bedrock), and November/December 2011 (overburden). Performance monitoring results following these injections confirmed that EVO amendments promoted further bioremediation in both the overburden and bedrock zones. A fourth injection event was conducted in September/October 2013.

This twelve-month data summary report reviews the results of three performance monitoring events executed during 2014 and evaluates the effects of the 2013 substrate injection and bioaugmentation in the twelve months since the injection event was

conducted. A six-month data summary report providing further details on the procedures and field activities performed in September-October 2013 was submitted in August 2014.

A Site Location Map is provided in Figure 1, and a Site Plan is provided in Figure 2.

SCOPE OF WORK

The following section briefly summarizes the work completed for the fourth injection event (September 9-October 1, 2013). The primary tasks included bedrock and overburden EVO substrate injections, dye tracer testing, 3-month performance sampling (i.e. approximately three months after substrate injections), 6-month performance sampling, and 12-month performance sampling.

The following is a timeline of key events:

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
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,	November 11 – December 13, 2011

Task	Start & Completion Date
INJ-8, INJ-9, INJ-10)	
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

SUBSTRATE INJECTIONS

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 (see Figure 3 for injection summary and locations).

Overburden or bedrock groundwater was extracted from injection wells or nearby wells for use as make-up water and for a water "push" behind the substrate. The substrate consisted of make-up water, SRS® (proprietary vegetable-oil based substrate with emulsifiers) and sodium bicarbonate as a pH buffer. At injection locations INJ-3 and INJ-4, an iron amendment, consisting of soluble and insoluble iron oxide, was added to decrease hydrogen sulfide concentrations, which could limit the rate of CVOC biodegradation. Additionally, fluorescein (green) dye tracer and Rhodamine WT (pink) dye tracer were added to the substrate solution at MW-16B and MW-18B, respectively. The results of the dye tracer tests were reported in the 6-month data summary report dated August 2014.

Bioaugmentation was conducted by injecting a microbial consortium including both *Dehalococcoides* (DHC) and *Dehalobacter* (DHB) species of bacteria. Bioaugmentation occurred at each of the 2013 injection points.

The table below summarizes the total substrate and bioaugmentation volumes for each injection point in October 2013.

2013 Injection Location	Total Volume of Substrate and Makeup Water Injected (gallons)	Total Volume of Bioaugmentation Solution Injected (liters)	Total Volume of Groundwater "Push" post-injection (gallons)
OVERBURDEN INJECTION WELLS			
INJ-1	507	2	60
INJ-2	507	2	60
INJ-9	118	1.8	25
INJ-10	118	3.3	25
BEDROCK INJECTION WELLS			
INJ-3	550	2	50
INJ-4	550	2	50
MW-16B	440	2.1	50
MW-18B	440	2	50

3-MONTH, 6-MONTH, AND 12-MONTH PERFORMANCE SAMPLING

Three, six, and twelve months after substrate treatment injections, selected monitoring wells were sampled to assess the performance of the bioremediation. Sampling procedures and purge water management were outlined in the six-month data summary report dated August 2014. Monitoring parameters for each of these events were the same, with the exception that microbes were not sampled during the 6-month event. The sampling matrix for the 3-month, 6-month, and 12-month performance monitoring events is summarized in Table 1. A complete round of water levels was collected prior to the start of each sampling event.

Copies of the groundwater sampling logs for the 12-month performance sampling are provided in Appendix A. Sampling logs for the 3-month and 6-month performance sampling events were provided in the 6-month data summary report.

DATA VALIDATION SUMMARY

Analytical results from the January 2014 3-month performance monitoring, the March/April 2014 6-month performance monitoring, and the October 2014 12-month performance monitoring 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 data submitted by the laboratory were 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 the NYSDEC ASP for organic and inorganic data review. The data are acceptable for their intended use.

The data usability summary report (DUSR) for the 12-month sampling event is included in Appendix B. The DUSRs for the 3-month and 6-month sampling performance monitoring events were provided in the 6-month data summary report.

RESULTS AND DISCUSSION

MONITORING RESULTS

A summary table of analytical results for the 3-month, 6-month, and 12-month performance sampling events is presented in Appendix C.

Bioremediation performance was evaluated based on: (1) geochemical data; (2) microbiological data; and (3) changes in groundwater concentrations of CVOCs with particular focus on the interrelationships of sequential degradation products (DCE, VC, and ethane plus ethane [E+E]) (US EPA guidelines, OSWER Directive 9200.4-17).

OVERBURDEN RESULTS

Figures 4A and 4B show time-series plots for geochemical parameters for selected overburden wells. Figure 5 illustrates the overburden well CVOC analytical results from the last four sampling events, including the 3-month (January 2014), 6-month (April 2014), and 12-month (October 2014) performance sampling events. Figures 6A through 6E show time series plots of CVOCs for selected wells and illustrate the longer term changes that have occurred starting before the initial injection event in August 2008. Overburden microbial concentration results are summarized in Table 2.

Geochemistry

Geochemical conditions in overburden wells in the source area (INJ-01, INJ-02, INJ-5U, INJ-5L, PMW-1, PMW-2, PMW-3, and MW-7A) show that the environment is appropriate for anaerobic *in situ* bioremediation (Total Organic

Carbon [TOC] above 50 mg/L, low sulfate concentrations, pH between 6 and 9, and negative oxidation reduction potential [ORP]). The following observations support this assessment.

- Sulfate: Sulfate levels in these source-area wells have remained at low concentrations, indicative of sulfate reducing conditions, when compared with pre-2011 injection levels. The average sulfate concentration in October 2014 for these wells was less than 5 mg/L when compared to an average of 246 mg/L in October 2011 (see Figure 4A).
- TOC: Well locations except PMW-1 (46 mg/L TOC in October 2014) and PMW-3 (29 mg/L TOC in October 2014) had a TOC greater than 50 mg/L (see Figure 4A). Although decreased TOC was observed from November 2012 to January 2014, the average TOC remained at approximately 75 mg/L in October 2014.
- pH: The pH after the 2013 injections was within a range supportive of CVOC biodegradation. The pH at INJ-5L and INJ-02 initially decreased to pH 6 or below but increased to above pH 6.5 in October 2014 (see Figure 4B).
- ORP: All wells have exhibited negative ORP values during the 3-month, 6-month, and 12-month performance sampling events (see Figure 4B).

Microbes

Microbial populations were sampled during the 3-month and 12-month performance sampling events in January 2014 and October 2014, respectively. The microbial populations in a subset of the source-area overburden wells (INJ-1, INJ-5L, INJ-5U, PMW-3, and MW-7A) had a median DHC of 10^4 cells/mL (ranging from 10^3 to 10^5 cells/mL) and a median DHB of 10^2 cells/mL (ranging from 1 to 10^2 cells/mL) in October 2014 (see Table 2). The DHC population increased in the source-area overburden wells from January to October 2014. Overall, the relatively low population counts are expected based on low CVOC concentrations. Population counts and specific degrading enzyme data from the 3-month and 12-month performance sampling events can be found in Appendix C.

CVOC Concentrations

Source Area

One of the objectives of the September 2013 injection event was to attain lower concentrations in overburden source areas, particularly in PMW-2, PMW-3, and INJ-02. Injection and bioaugmentation in the overburden source area in September 2013 occurred in INJ-01 and INJ-02.

- CVOCs in INJ-01, PMW-2, and PMW-3 have generally showed a decreasing trend since the Fall 2011 injections. (see Figures 6A and 6B).
- Injection well INJ-2 exhibited an order of magnitude decrease in CVOC concentrations following the 2013 injections. TCE, DCE, and VC concentrations in October 2014 were the lowest recorded at this location since injections began in 2008 (see Figure 6B).
- INJ-5(U/L) showed decreasing TCE, DCE, and VC concentrations following each injection event (2011 and 2013). Additionally, concentrations of E+E have remained elevated in INJ-5U (Figure 6C).
- MW-7A exhibited a step-like reduction in TCE, DCE, and VC concentrations after each overburden injection event, including the 2013 injections (see Figure 6D).
- Since the 2011 overburden injection, PMW-1 continues to exhibit decreased levels of TCE, DCE, and VC (less than 3 µg/L) (see Figure 6D). E+E concentrations increased slightly following the 2013 injections.

MW-4 Area

This area was targeted for treatment in November 2011 and September 2013 due to elevated concentrations in MW-4A, but it appears to be unrelated to the main source area near PMW-2. TCE, DCE, and VC have decreased to their lowest recorded levels following the 2013 injection (see Figure 6E). TCE decreased by approximately two orders of magnitude since the 2011 injections, whereas DCE and VC both decreased by approximately one order of magnitude. TCE, DCE and VC are currently all near or below the groundwater standard (from 0.6 µg/L TCE to 5.8 µg/L VC). These decreasing concentrations of TCE, DCE, and VC appear to be directly related to substrate injection and bioaugmentation in wells INJ-9 and INJ-10. The highest recorded concentration of E+E was observed during the 3-month event in January 2014, indicating a complete biodegradation pathway.

BEDROCK RESULTS

Figures 7A and 7B show time-series plots for geochemical parameters for selected bedrock wells. Figure 8 shows a summary of the bedrock well CVOC analytical results from the last four sampling events, including the 3-month (January 2014), 6-month (April 2014), and 12-month (October 2014) performance sampling events. Figures 9A through 9E show longer-term time series plots for selected wells and illustrate the changes since prior to the initial injection event in August 2008. Bedrock microbial concentration results are summarized in Table 2.

Geochemistry

Geochemical conditions in bedrock wells show that the environment is appropriate for anaerobic *in situ* bioremediation. The following observations support this assessment.

- Sulfate: In January 2014, sulfate levels decreased in MW-7B (near source area), PMW-8 (downgradient of source area), and in PMW-5, PMW-7, and MW-17B (near injection wells INJ-3 and INJ-4), after the 2013 injections. This was followed by slight increases in sulfate concentrations over the 12 months following the 2013 injection in all wells but MW-17B (see Figure 7A).

- TOC: Wells PMW-5, PMW-7, and MW-17B (in the vicinity of bedrock injection wells INJ-3 and INJ-4) exhibited large increases in TOC (three and two orders of magnitude, respectively) in January 2014, followed by smaller declines in April and October 2014. A similar pattern was seen in these wells following the Fall 2009 bedrock injection (see Figure 7A). Well MW-7B (in the vicinity of overburden injection wells INJ-1 and INJ-2) has shown increases in TOC following each overburden injection in the area (2008, 2009, 2011 and 2013). Well MW-16B (an October 2013 bedrock injection location) has shown an order of magnitude increase in TOC that has been sustained for 12 months following the injection event (see Figure 7A). Wells showing smaller, but measurable increases in TOC include PMW-8 (upgradient of bedrock injection wells INJ-3 and INJ-4), MW-10B, and MW-11B.

- pH: The pH after the 2013 injections was within a range supportive of CVOC biodegradation. The pH at PMW-5 initially decreased to below pH 6 but increased to pH 6.4 in October 2014 (see Figure 7B).

- ORP: Bedrock wells exhibited anaerobic conditions (negative ORP values) in the 12 months following the 2013 injections, with the exception of MW-10B in January and April 2014. October 2014 performance sampling results at this well indicate a return to anaerobic conditions (see Figure 7B).

Microbes

The microbial populations were sampled in January 2014 and October 2014 from bedrock wells PMW-5 (near INJ-3 and INJ-4 bedrock injection) and MW-18B (injection well). DHC populations in October 2014 in these wells ranged from 10^3 cells/mL (MW-18B) to 10^4 cells/mL (PMW-5). DHB populations in October 2014 in these wells ranged from 10^1 cells/mL in MW-18B, to 10^2 cells/mL in PMW-5 (see Table 2). The population of DHC in PMW-5 increased by three orders of magnitude between January 2014 and October 2014. Overall, the relatively low population counts are expected based on low CVOC concentrations.

CVOC Concentrations

Source Area Wells and Vicinity

- MW-7B. TCE concentrations in MW-7B were not detected during the 2014 performance sampling events, and DCE and VC concentrations remained at levels less than 9 µg/L in 2014 (see Figures 8 and 9A). E+E

concentrations remained at similar levels as prior to the 2013 substrate injection.

- PMW-8. TCE has not been detected in downgradient bedrock well PMW-8 during all sampling events between 2008 and 2014. DCE and VC concentrations (1.6 µg/L and 1.3 µg/L in October 2014, respectively) decreased slightly compared to before the 2013 upgradient overburden and downgradient bedrock substrate injections (see Figures 8 and 9A).
- MW-16B. TCE concentrations decreased approximately two orders of magnitude in MW-16B from November 2012 (430 µg/L) to October 2014 (not detected). TCE concentrations were below detection limits during all three 2014 performance sampling events (see Figures 8 and 9B). DCE and VC concentrations decreased more than two orders of magnitude from January 2014 to October 2014. E+E concentrations remained elevated following the 2013 injections, but decreased slightly in the following 12 months.

Pilot Test Area Wells (high bedrock concentration area)

- PMW-5. TCE, DCE, and VC concentrations decreased slightly after the 2013 injection (see Figures 8 and 9B). E+E concentrations decreased during the 3-month performance sampling (55.5 µg/L in January 2014), then increased during the 6-month and 12-month events (98.2 µg/L in October 2014), indicating continued, complete biodegradation of TCE.
- MW-17B. Concentrations of DCE and VC decreased by an order of magnitude after the 2013 injections in MW-17B (see Figure 9C), indicating the progression of bioremediation following the 2013 injections in nearby injection wells INJ-1 and INJ-2. E+E has also shown a slight decreasing trend during the 2014 performance sampling events. TCE was not detected in MW-17B during performance monitoring events between 2010 and 2014. Over the course of the injection events, concentrations in this well have decreased from approximately 600 µg/L DCE down to below the groundwater standard.
- PMW-7. Concentrations of TCE, DCE, and VC have decreased from pre-2013 injection levels, whereas E+E concentrations have increased slightly (Figure 9C), indicating progression of bioremediation following the 2013 injections in nearby injection wells INJ-1 and INJ-2.

Downgradient Wells

- MW-10B and MW-11B. TCE has not been detected in MW-10B since 2008 and in MW-11B since 2006. DCE and VC concentrations in MW-10B are slightly lower than levels prior to the 2013 injections, and DCE and VC concentrations at MW-11B remained low, below 3 µg/L (see Figure 9D). E+E concentrations in MW-11B remained elevated in October

2014, and increased to their highest recorded levels at MW-10B (211 µg/L).

- MW-18B. Bedrock injection well MW-18B showed decreases in DCE and VC, and increases in E+E indicating progression of bioremediation after the 2013 injections (see Figure 9E). TCE was not detected in MW-18B during monitoring events between 2001 and 2014.

LONG-TERM BIOREMEDIATION RESULTS

Figure 10 illustrates the long-term time-series plots for total CVOCs at source area and downgradient wells and confirms the unequivocal improvement in groundwater conditions that have occurred as the result of enhanced bioremediation activities. Source area wells MW-4A, MW-7A, and MW-17B exhibited steady, elevated levels of total CVOCs prior to injections, followed by significant, one to two order of magnitude decreases in concentration following the injections.

Mass discharge was calculated to quantify the reduction in CVOC migration in both overburden and bedrock from August 2008 (pre-bioremediation injections) to October 2014 (see Appendix D). The mass discharge was calculated over pre-defined sections located in proximity to overburden and bedrock high concentration areas. Results indicate an overall 95 percent reduction of CVOC mass discharge in the overburden, and a 95 percent reduction of CVOC mass discharge in bedrock. These results further confirm that that bioremediation injections have improved the site groundwater quality.

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 steady levels of total CVOC concentrations during the pre-injection time period, followed by significant decreases up to two orders of magnitude relative to pre-2008 total CVOC concentrations (see Figure 10).

Natural anaerobic biodegradation of TCE to final degradation products (DCE, VC, and E+E), which was occurring at the Site prior to 2008, was enhanced significantly by the Site bioremediation injection program. At present, CVOCs within the source area and downgradient have decreased such that further injections to enhance the natural attenuation process are not required.

CONCLUSIONS

Specific conclusions developed from the performance monitoring conducted to date are presented below:

- Significant decline in CVOC concentrations in the overburden and bedrock groundwater is directly attributed to the bioremediation injections conducted in 2008, 2009, 2011, and 2013.
- Overburden. Data from the performance monitoring 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. Significant reductions in CVOC concentrations were observed in overburden wells MW-4A, PMW-2, and INJ-02. Achieving CVOC reductions in these wells was a specific objective of the 2013 injections. Any CVOC increases in certain wells in the vicinity of injection locations observed during the 6-month performance monitoring have since decreased during the 12-month performance monitoring. Geochemical conditions in both overburden and bedrock wells shows that the environment is suitable for anaerobic bioremediation.

- Bedrock. Bedrock groundwater CVOC concentrations generally decreased or remained stable when compared with the previous rounds of monitoring. TCE was non-detect in all bedrock monitoring wells except PMW-5, PMW-7, and MW-18B. Significant CVOC reductions were observed in wells MW-16B (TCE, DCE, and VC), and PMW-7, MW-17B, and MW-18B (DCE and VC). Achieving CVOC reductions in these wells was a specific objective of the 2013 injections. Downgradient wells continue to show decreases in CVOC concentrations, with significant decreases in total CVOCs observed since the injections began in 2008.
- Increases in E+E were observed in bedrock wells MW-16B (injection location), MW-18B (injection location), MW-10B (far downgradient) and MW-11B (far downgradient).

In summary, the remedy is progressing as intended. In most locations, significant decreases in CVOC concentrations as the result of the bioremediation injections conducted between 2008 and 2013 have been realized. Other individual locations have been less affected, with observed fluctuation of residual CVOCs and other parameters. Also, mass discharge calculations confirmed the reduction in CVOC migration.

Based on the results of the bioremediation injections conducted between 2008 and 2013 and intensive monitoring, the remedial objective of enhancing the natural attenuation process in groundwater has been achieved. No further injections are recommended at this time. The annual monitoring program will continue as a means of monitoring continued progress.

REFERENCES

Parsons, August 2014. Six-Month Data Summary Report, Former Carborundum Company, Hyde Park Facility, Town of Niagara, Niagara County, NY.

U.S. Environmental Protection Agency, 1997, Use of Monitoring Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. Office of Solid Waste and Emergency Response Directive 9200.4-17.

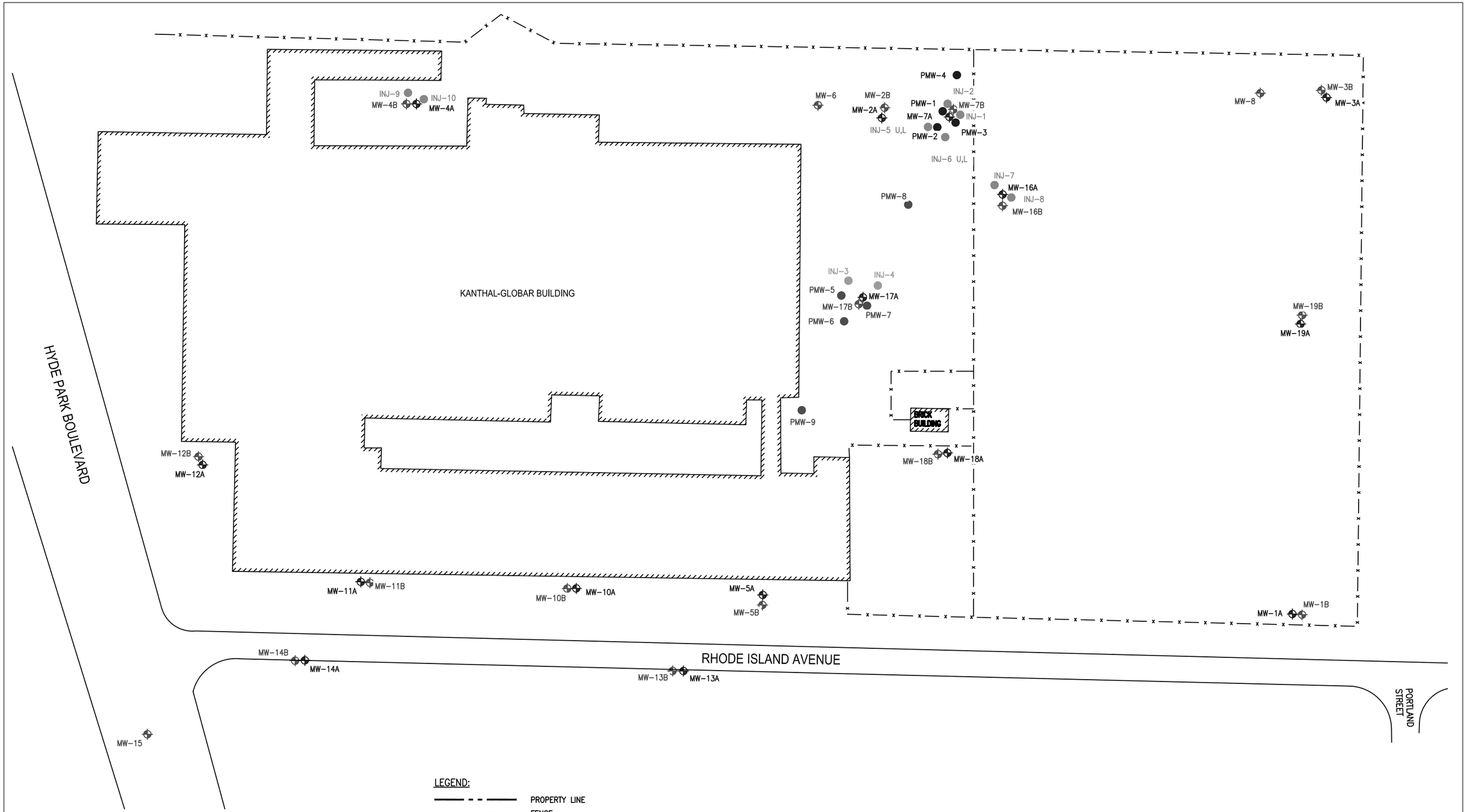
FIGURES

FIGURE 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	
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-1	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 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

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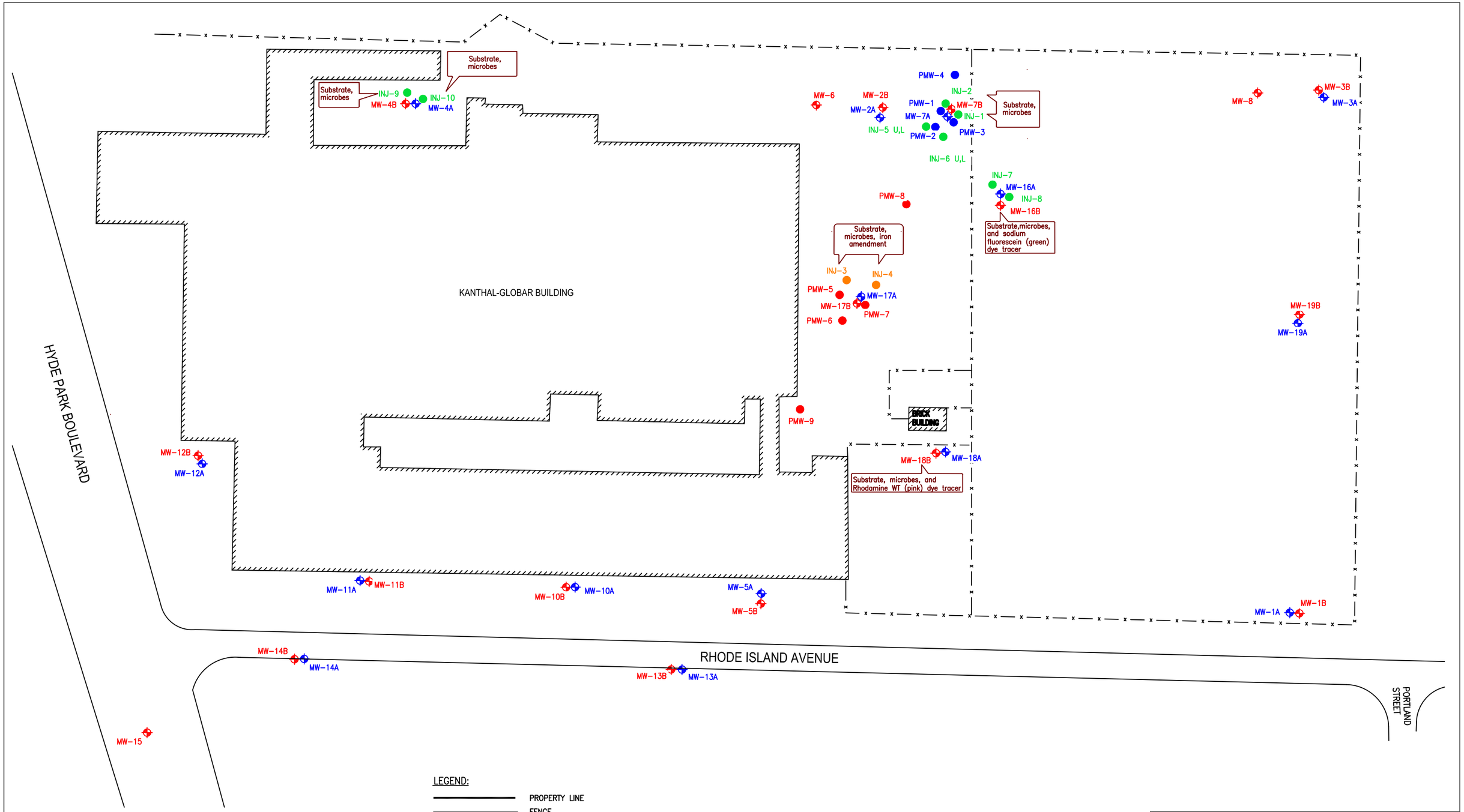
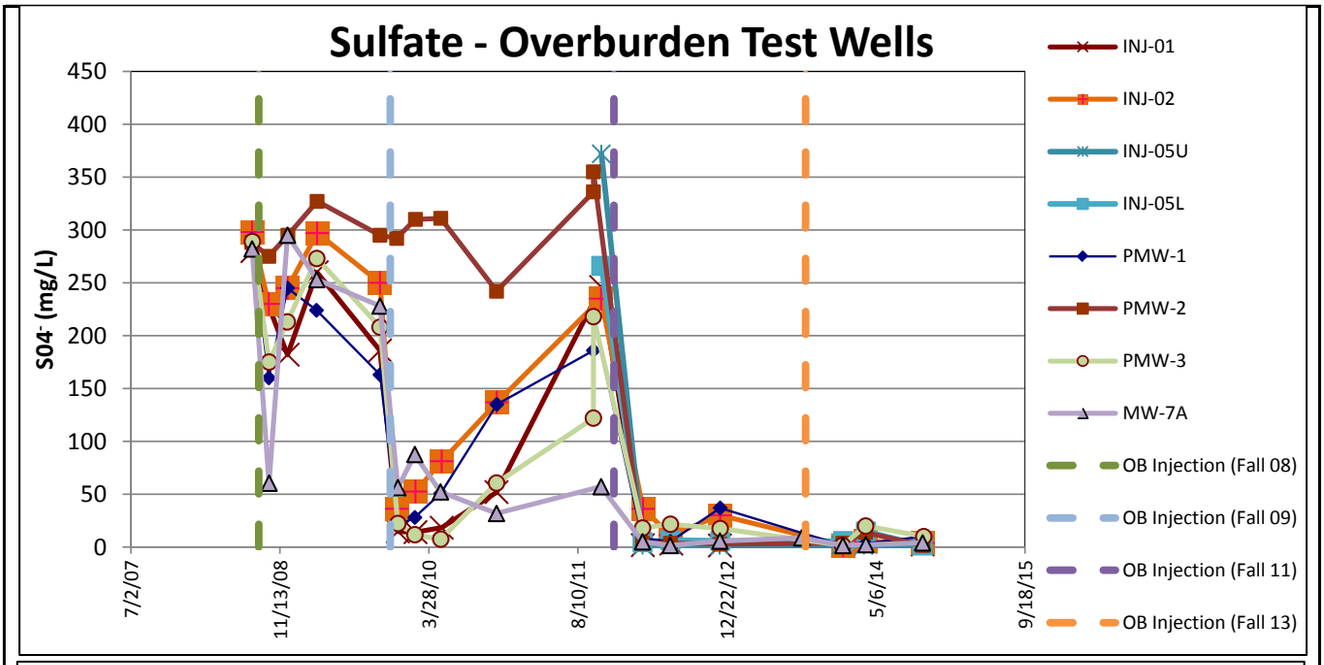


FIGURE 3

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NEW YORK
INJECTION SUMMARY
FALL 2013

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



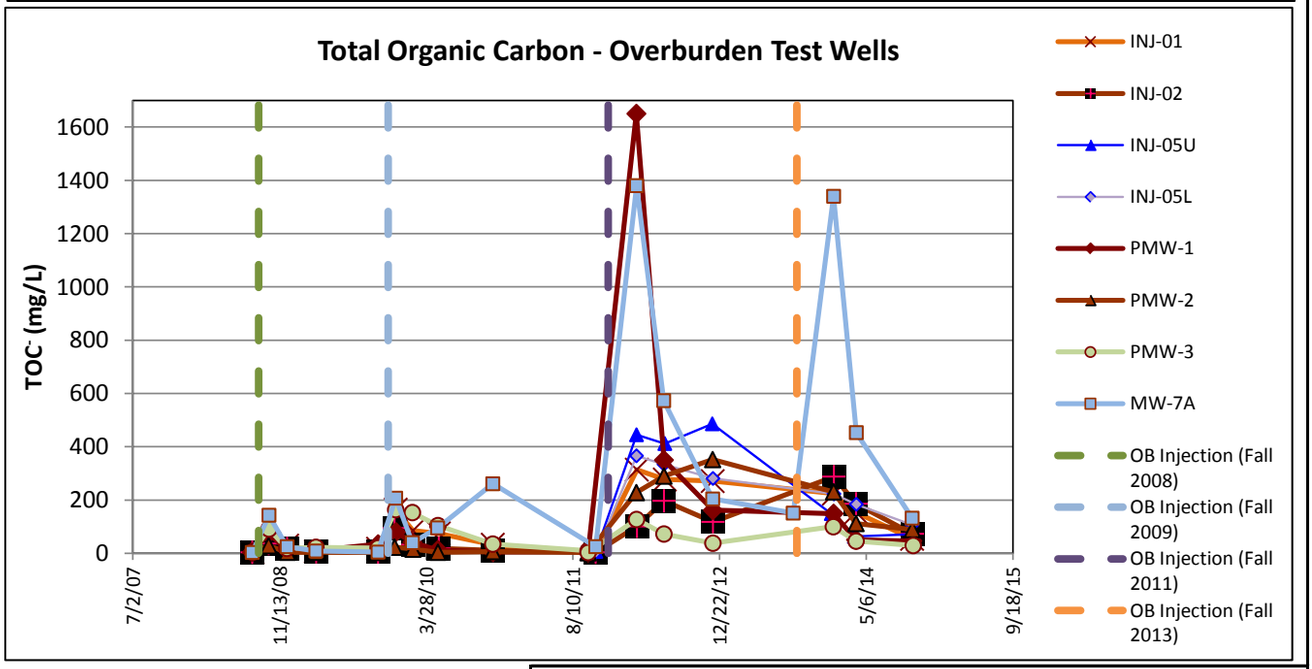


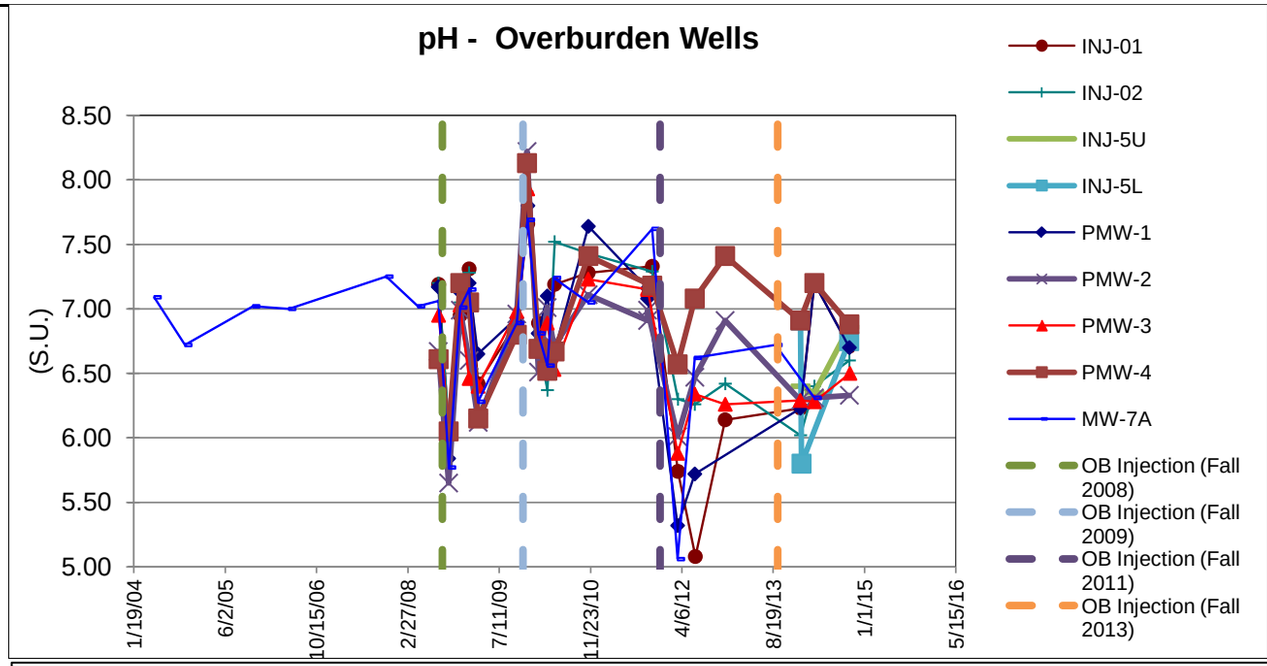
FIGURE 4 A

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY

TRENDS OF GEOCHEMICAL INDICATORS
IN SELECTED OVERBURDEN WELLS

PARSONS

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



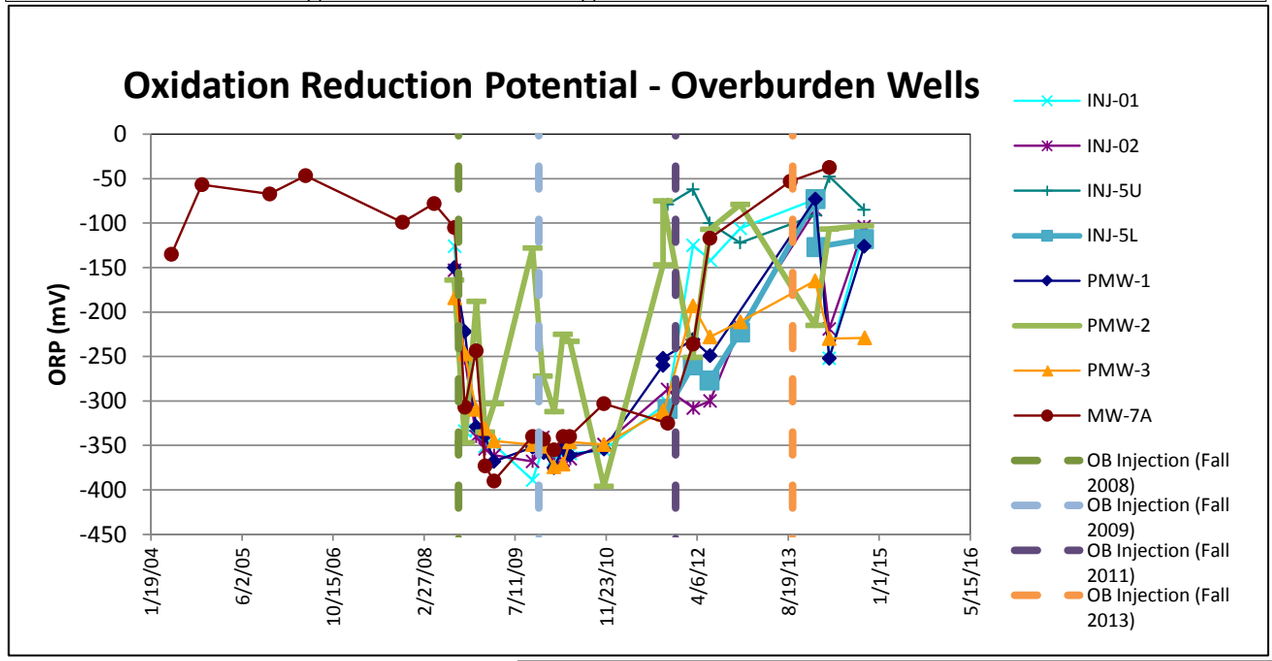


FIGURE 4 B

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY

TRENDS OF GEOCHEMICAL INDICATORS IN SELECTED OVERBURDEN WELLS

PARSONS

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

PMW-1	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1 U	0.5 U	0.5 U
DCE	#N/A	0.98 J	0.5 U	1.5
VC	#N/A	2.2 J	1.2	2.2
E+E	#N/A	20.7	30	25.8

PMW-4	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1 U	0.5 U	0.5 U
DCE	#N/A	4 J	2.4	0.87 J
VC	#N/A	1.3 J	1.6	1.4
E+E	#N/A	7.9	10	14.4

INJ-02	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1 U	1	0.5 U
DCE	#N/A	5.8	6.4	0.77 J
VC	#N/A	6.8	3.7	1.6
E+E	#N/A	42.7	30	23

MW-7A	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	3.9 J	4 J	3	0.92 J
VC	2.2 J	1.8 J	1	0.94 J
E+E	14.5	11.1	7.5	5.7

INJ-01	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1 U	3.5	0.5 U
DCE	#N/A	3.5 J	69	2.9
VC	#N/A	4.7 J	14	15
E+E	#N/A	64	78	139

MW-4A	Aug-13	Jan-14	Apr-14	Oct-14
TCE	4.2 J	1.1 J	1.2	0.57 J
DCE	31	7.5	3.7	5.3
VC	11	7.2	4.1	5.8
E+E	61.4	70	51.2	59.5

INJ-05U	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1.9 J	0.5 U	1.3
DCE	#N/A	5.2	1.2	4.3
VC	#N/A	3.9 J	2	2.4
E+E	#N/A	219.6	274	224

INJ-05L	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1 U	0.54 J	0.5 U
DCE	#N/A	12	4.1	1.3
VC	#N/A	17	11	3.4
E+E	#N/A	54.5	35	24.1

PMW-3	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1.9 J	4.3	0.5 U
DCE	#N/A	36	250	110
VC	#N/A	27	55	51
E+E	#N/A	96.1	133	129

PMW-2	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1.6 J	19	2.5
DCE	#N/A	56	270	27
VC	#N/A	19	48	7.9
E+E	#N/A	183	166	123

MW-16A	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	8.5	9	5.9	8.6
VC	300	78	140	350
E+E	73.1	7.4	21	53

HYDE PARK BOULEVARD

KANTHAL-GLOBAR BUILDING

BRICK BUILDING

RHODE ISLAND AVENUE

PORTLAND STREET

INJ-9 INJ-10 MW-4A MW-12A MW-11A MW-10A MW-5A MW-14A MW-13A MW-2A INJ-5 U,L INJ-6 U,L PMW-4 INJ-2 PMW-1 MW-7A INJ-1 PMW-2 PMW-3 INJ-7 MW-16A INJ-8 MW-17A MW-18A MW-3A MW-19A MW-1A

LEGEND:

- PROPERTY LINE
- FENCE
- MW-5A — OVERBURDEN MONITORING WELL LOCATION
- PMW-1 — OVERBURDEN PERFORMANCE MONITORING WELL LOCATION
- INJ-1 — OVERBURDEN INJECTION WELL LOCATION

CONCENTRATIONS IN ug/L (ppb)
#N/A = NOT SAMPLED

SAMPLE DATE	
TCE	TRICHLOROETHENE
DCE	CIS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
E+E	ETHANE + ETHENE

SOURCE: INTERA, 2006

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

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60 40 20 0 60
SCALE IN FEET

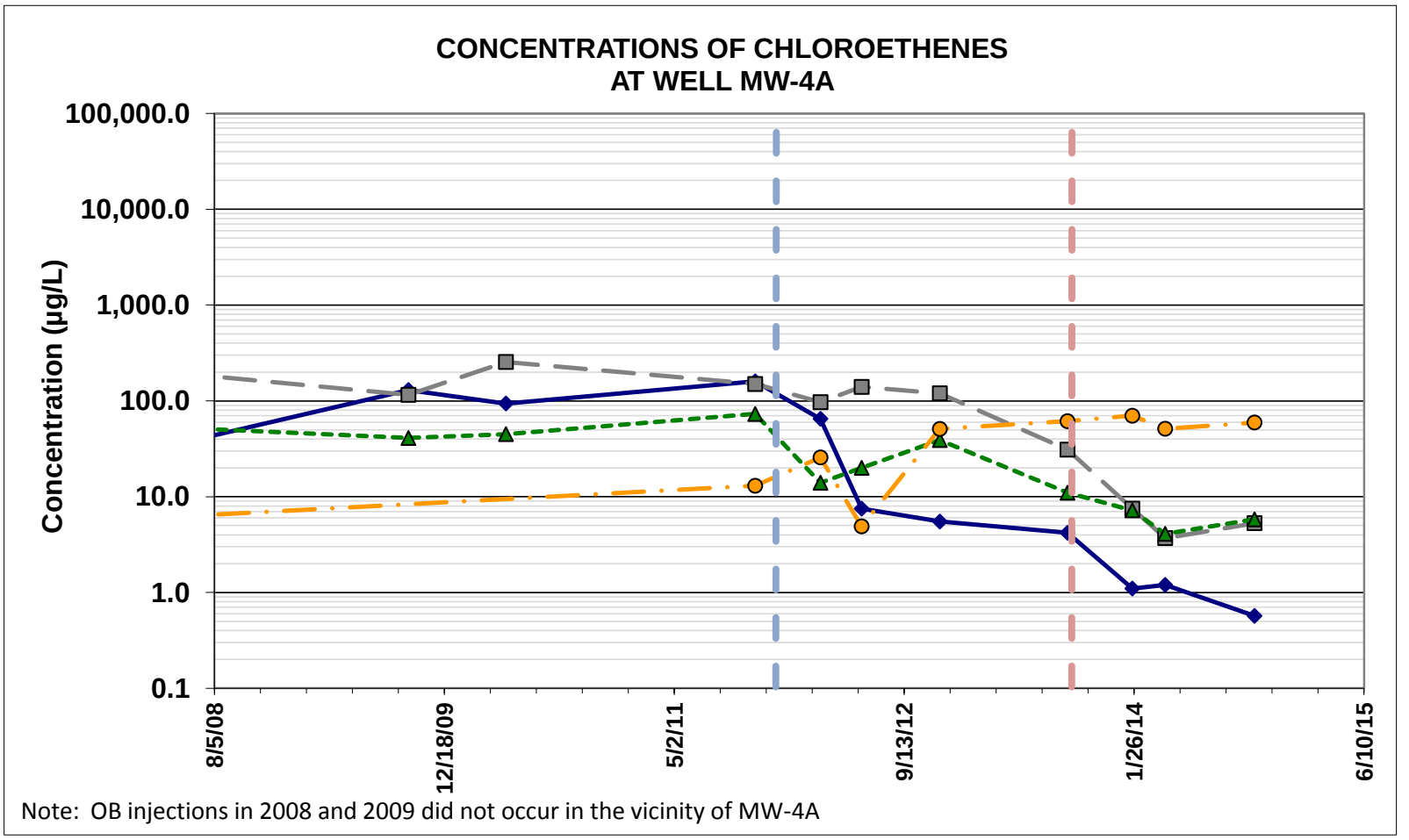
N

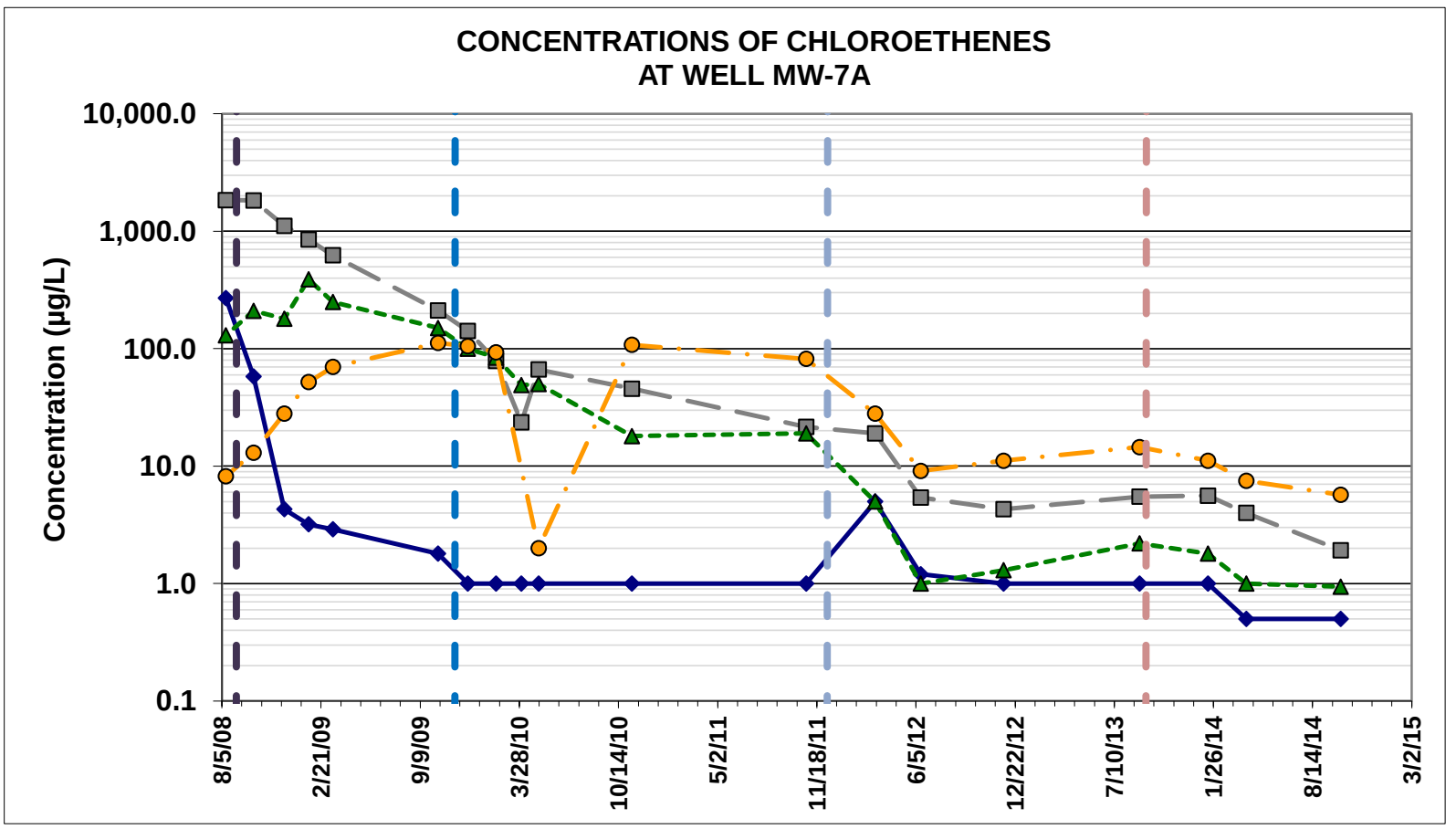
FIGURE 5

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NEW YORK

VOC CONCENTRATIONS IN OVERBURDEN GROUNDWATER

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





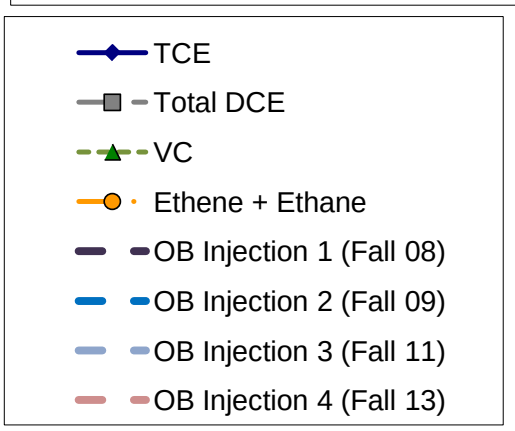
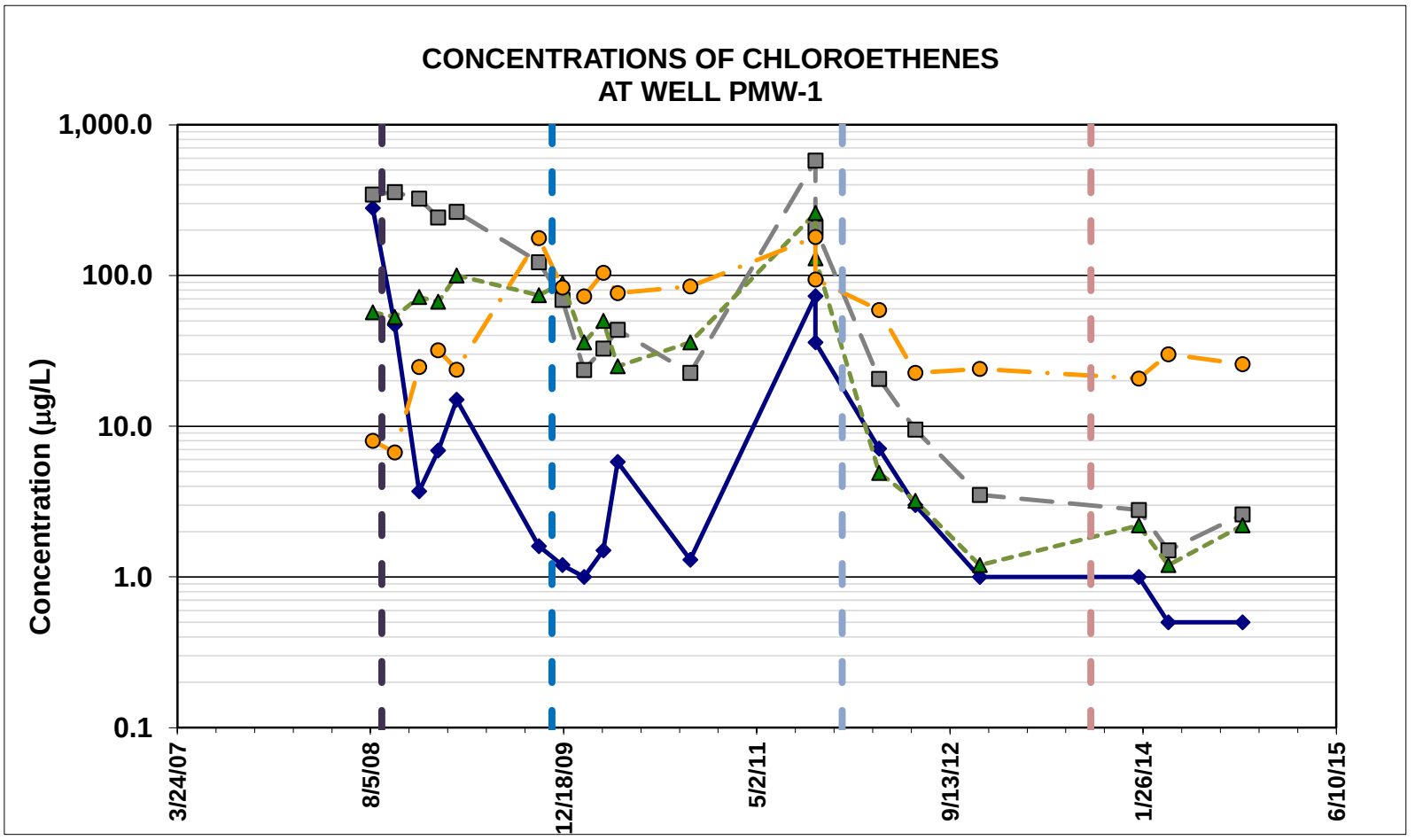


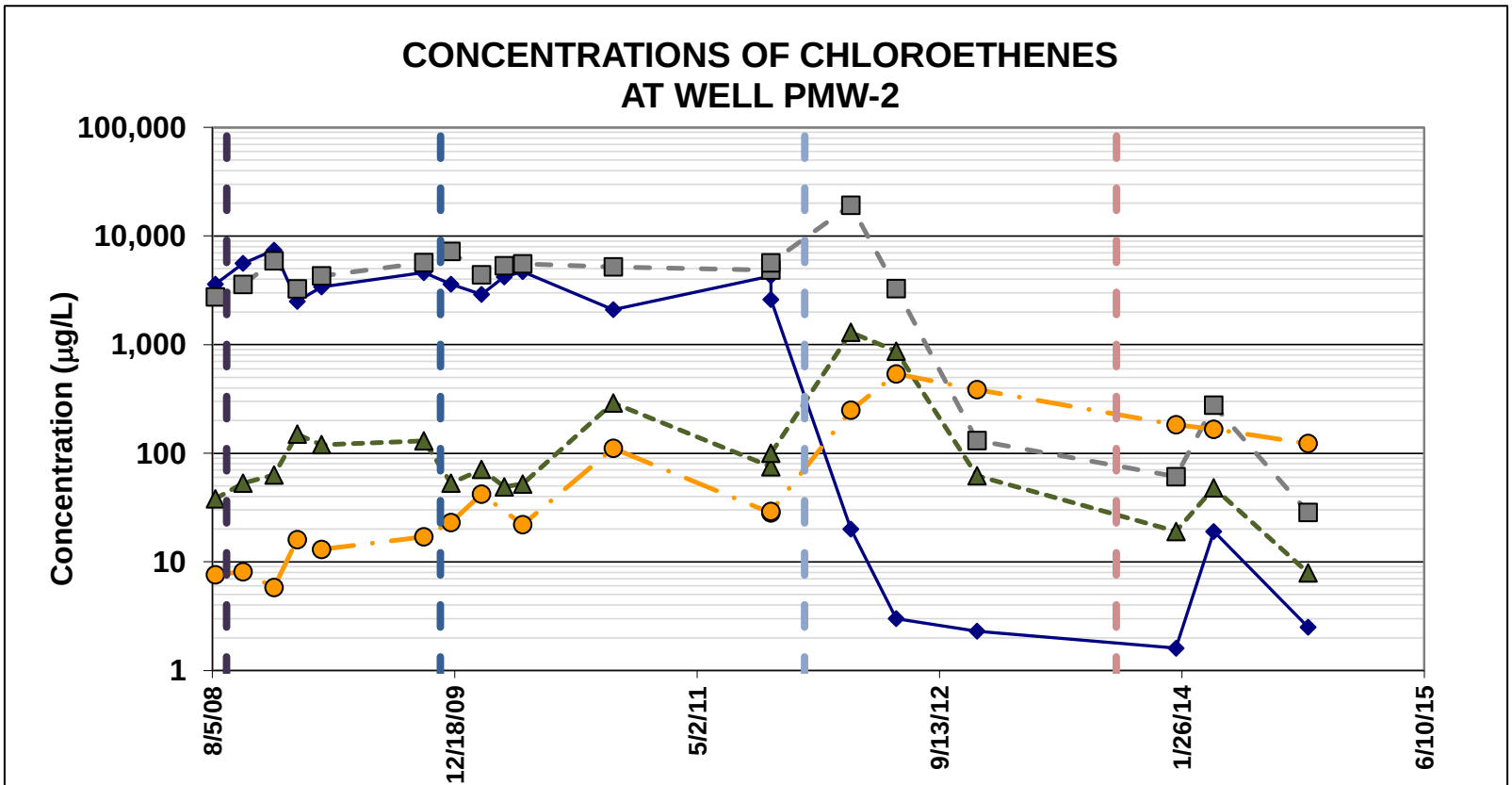
FIGURE 6A

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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





Note: the first two injections treated upgradient to this well

TCE
Total DCE
VC
Ethene + Ethane
OB Injection 1 (Fall 08)
OB Injection 2 (Fall 09)
OB Injection 3 (Fall 11)
OB Injection 4 (Fall 13)

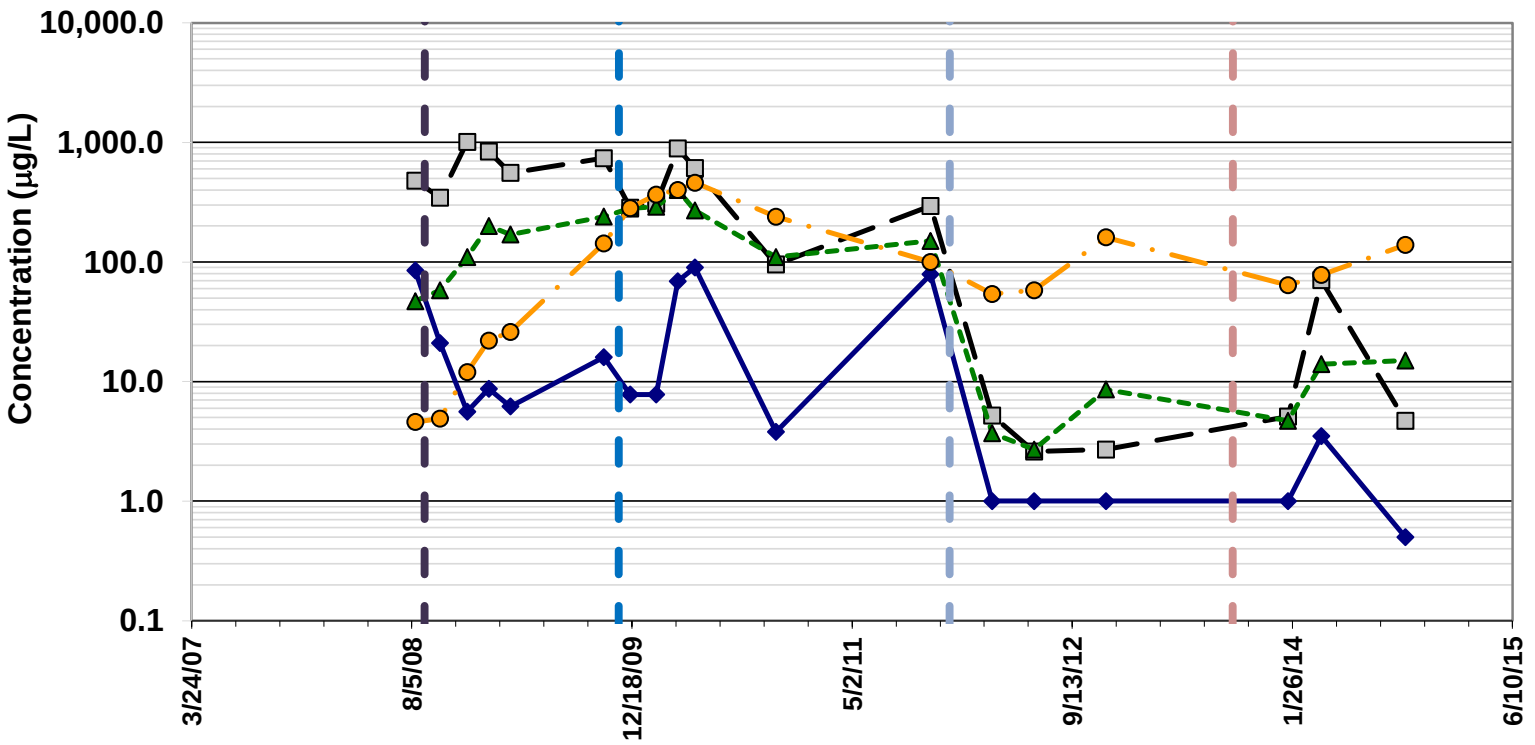
FIGURE 6B

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

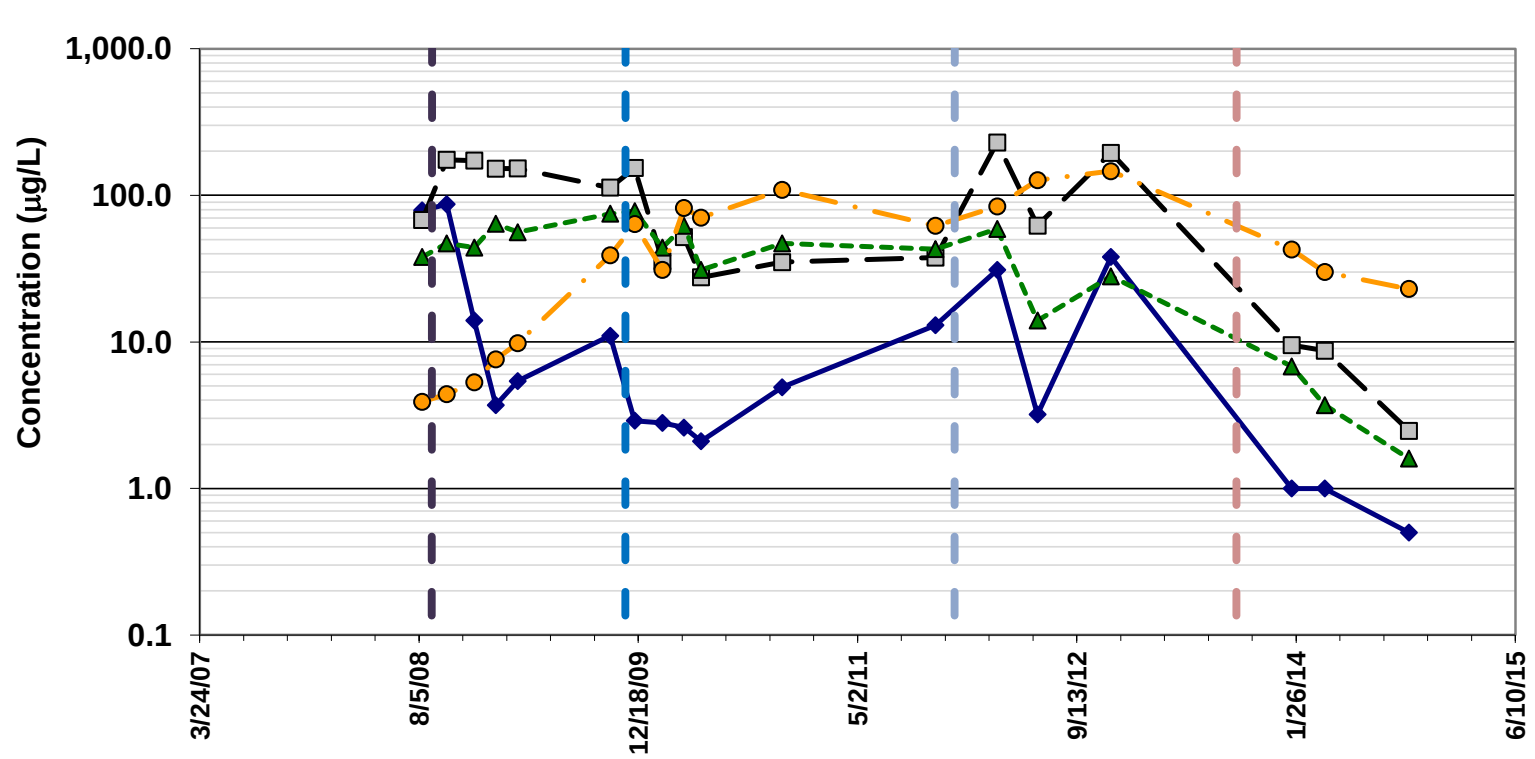
TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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

CONCENTRATIONS OF CHLOROETHENES AT WELL INJ-01



CONCENTRATIONS OF CHLOROETHENES AT WELL INJ-02



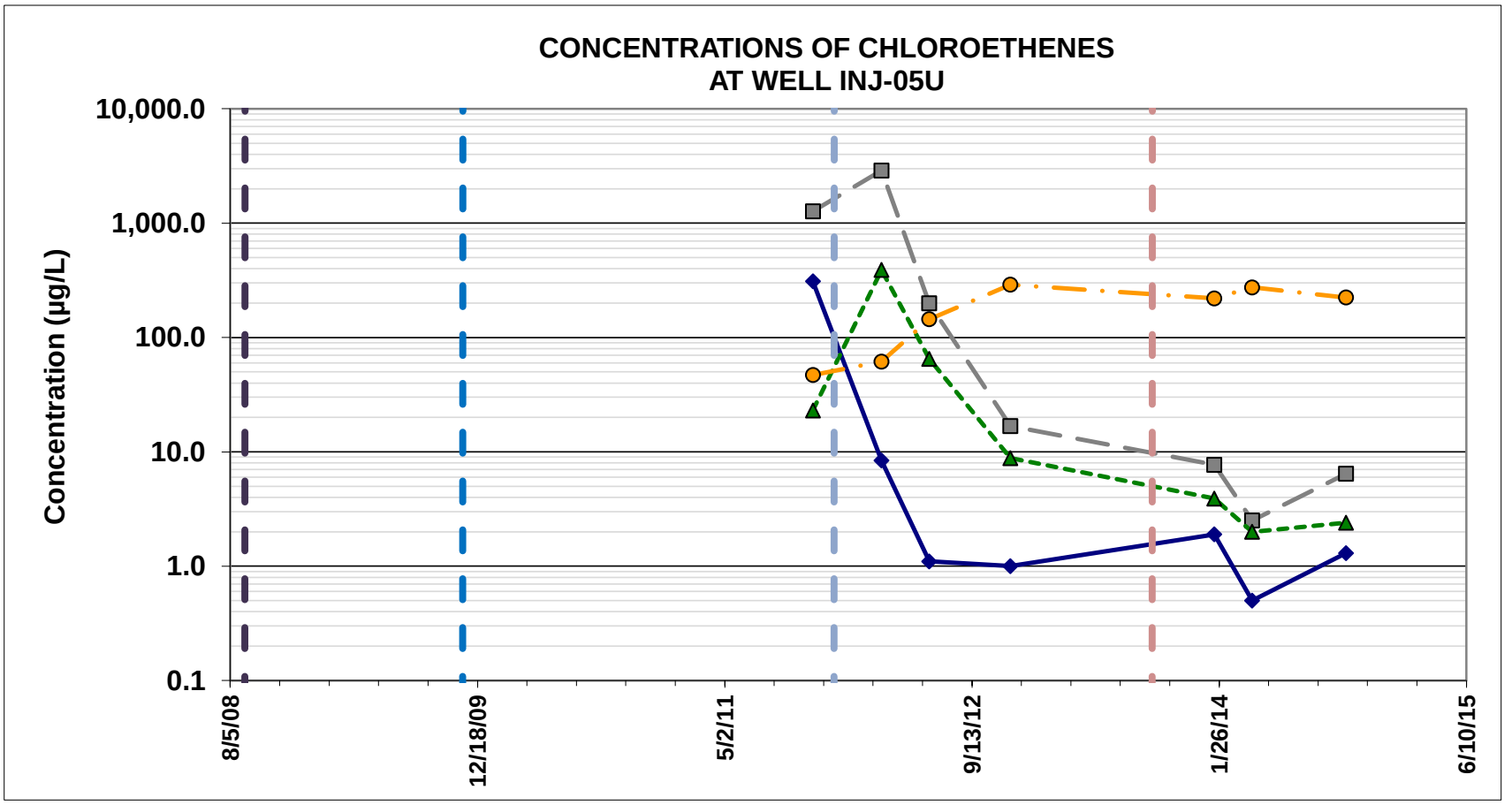
TCE
Total DCE
VC
Ethene + Ethane
OB Injection 1 (Fall 08)
OB Injection 2 (Fall 09)
OB Injection 3 (Fall 11)
OB Injection 4 (Fall 13)

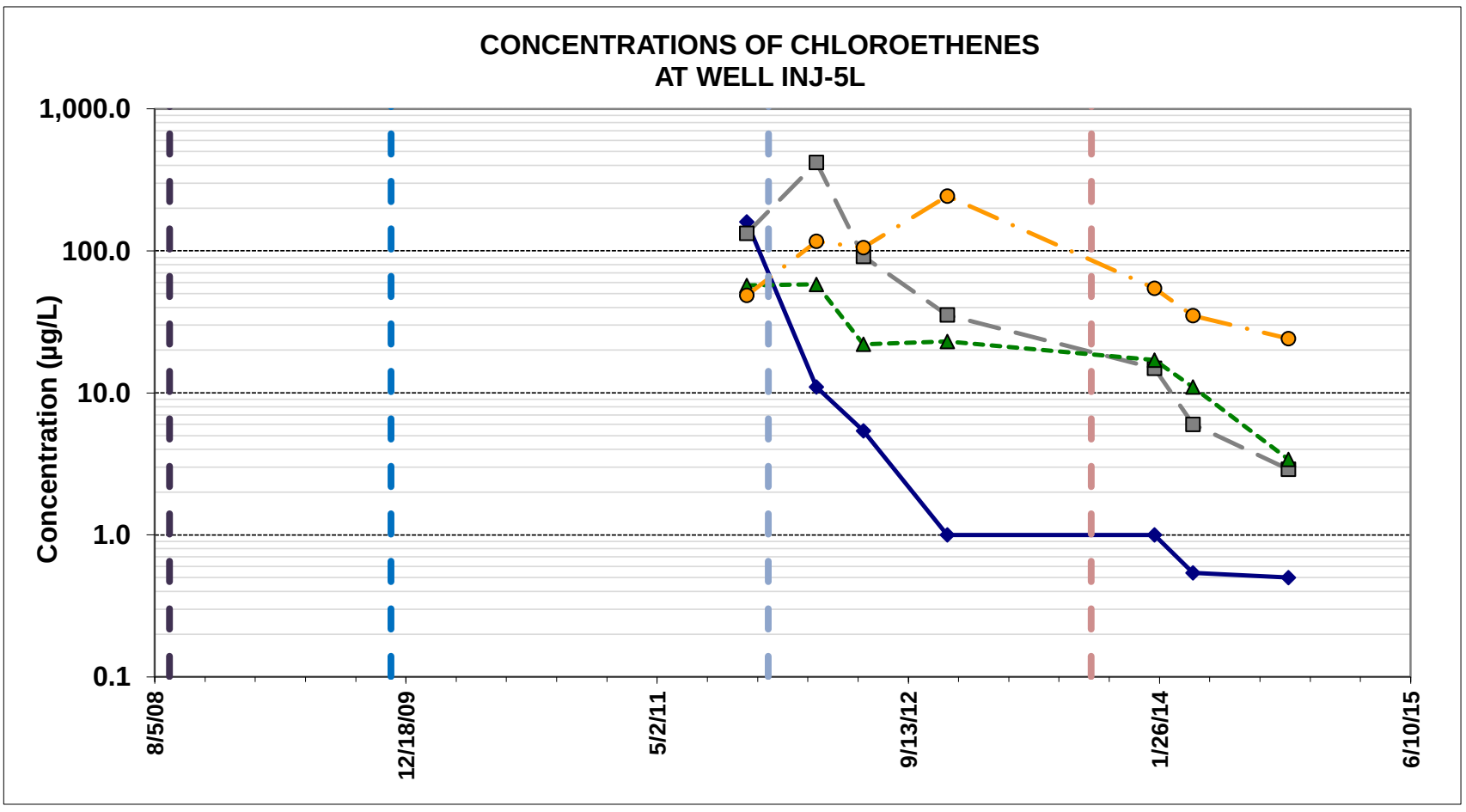
FIGURE 6C

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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





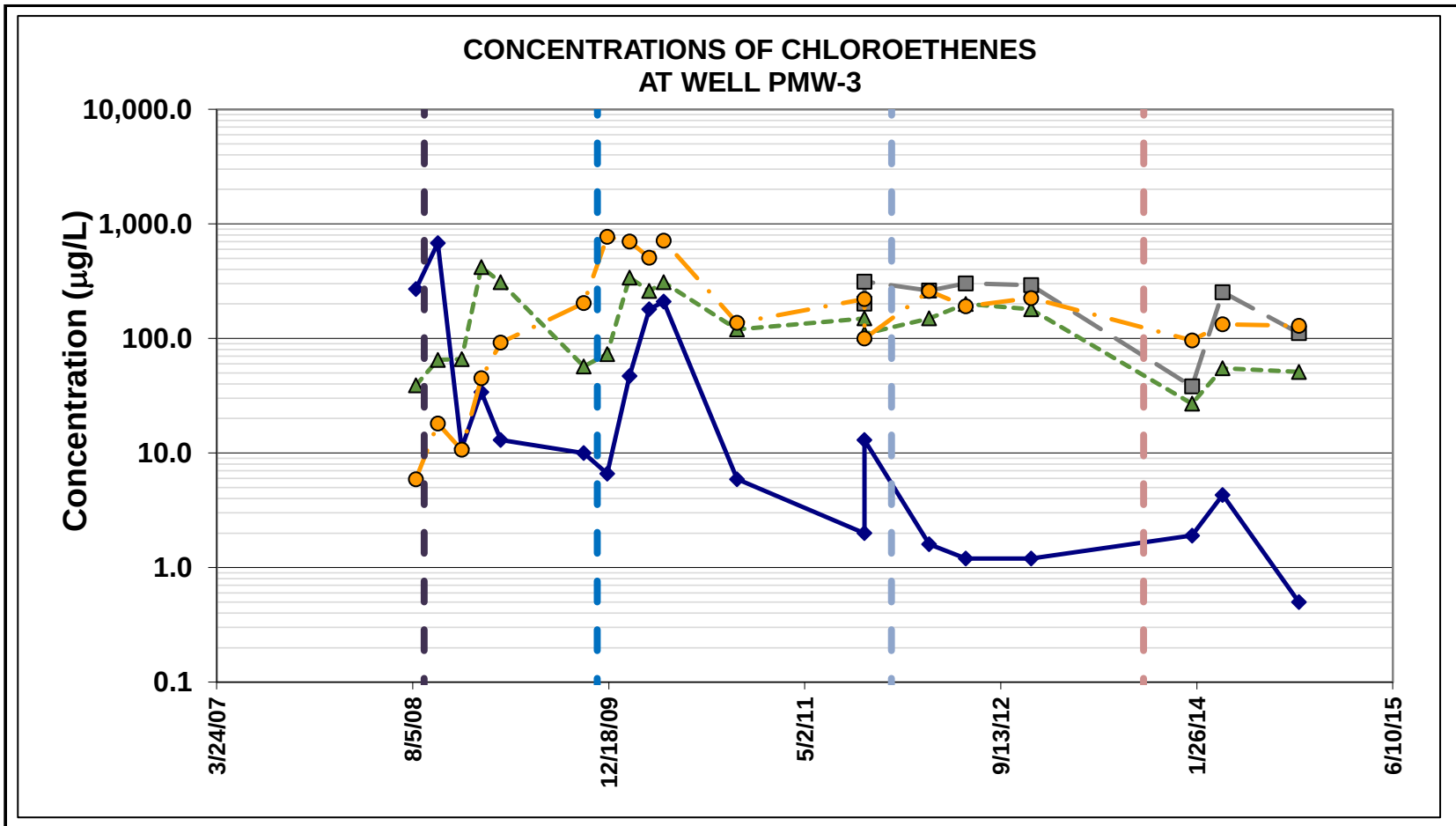
TCE
Total DCE
VC
Ethene + Ethane
OB Injection 1 (Fall 08)
OB Injection 2 (Fall 09)
OB Injection 3 (Fall 11)
OB Injection 4 (Fall 13)

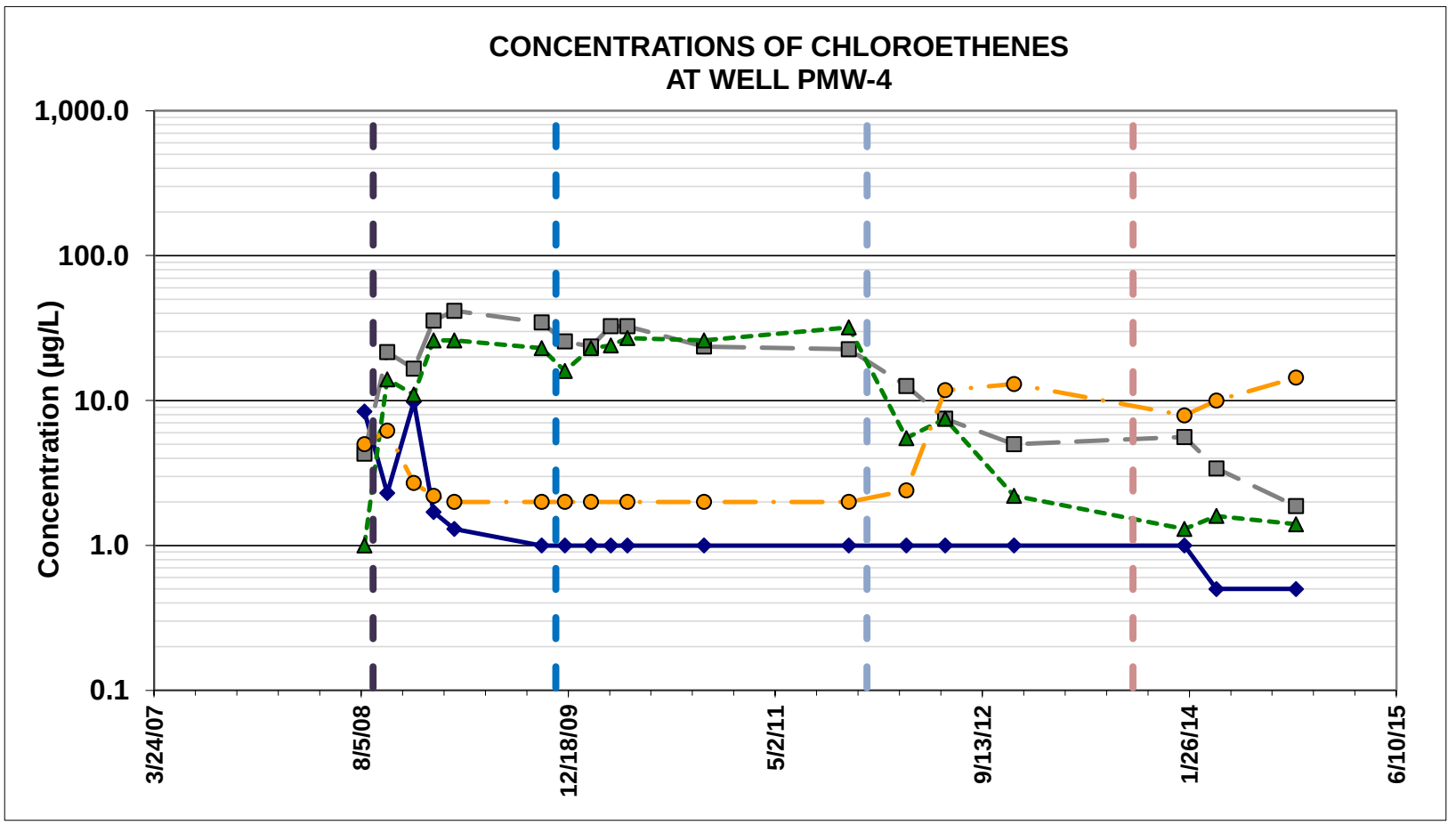
FIGURE 6D

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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





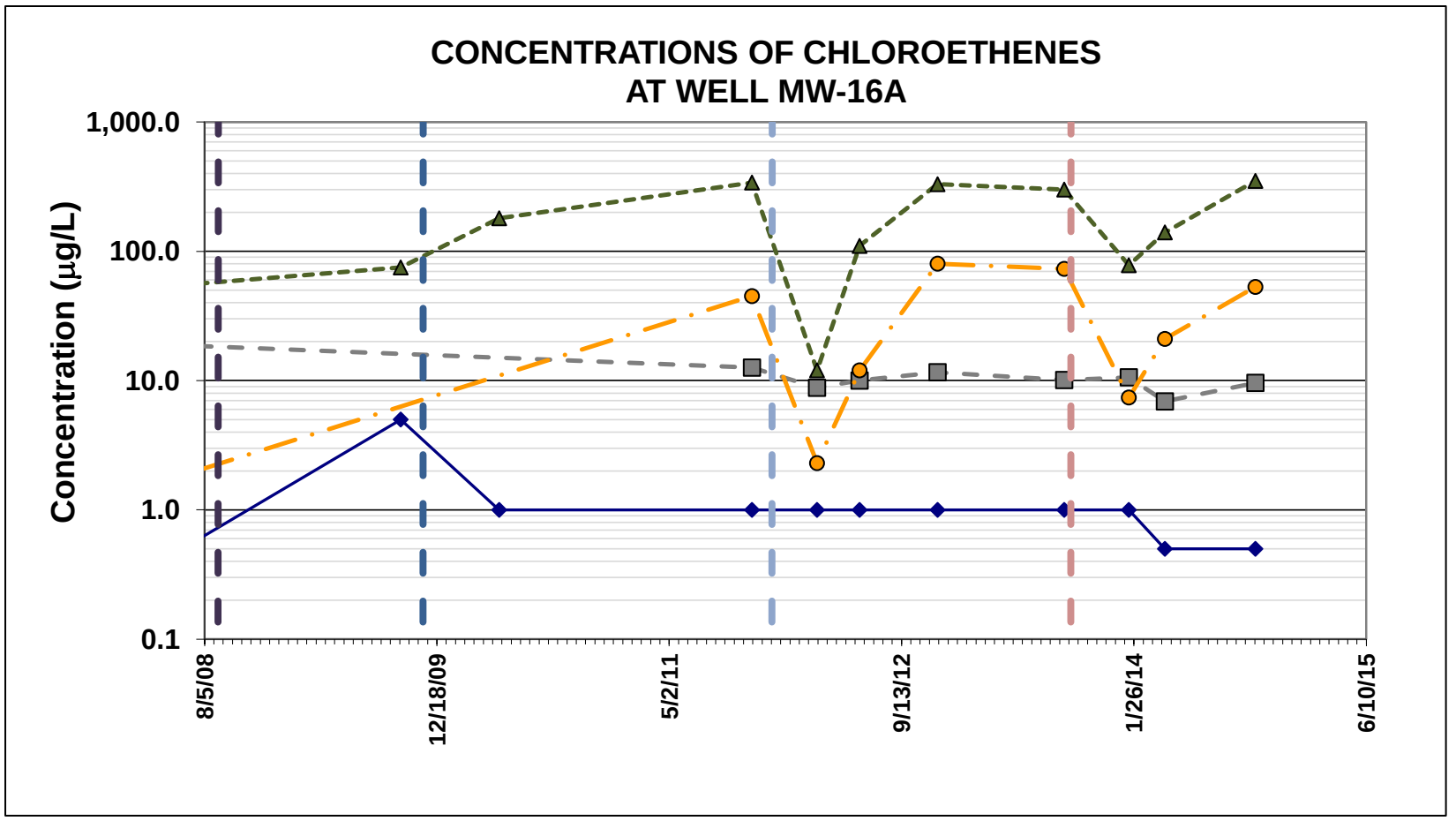
TCE
Total DCE
VC
Ethene + Ethane
OB Injection 1 (Fall 08)
OB Injection 2 (Fall 09)
OB Injection 3 (Fall 11)
OB Injection 4 (Fall 13)

FIGURE 6E

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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



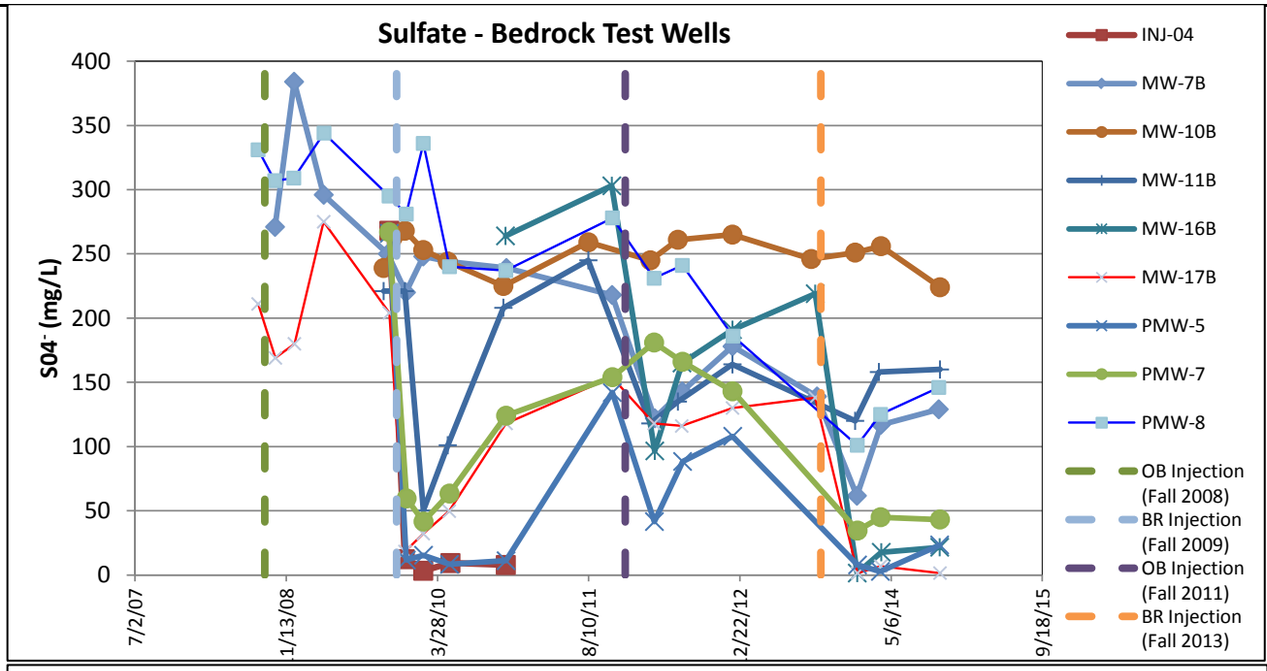
TCE
Total DCE
VC
Ethene + Ethane
OB Injection 1 (Fall 08)
OB Injection 2 (Fall 09)
OB Injection 3 (Fall 11)
OB Injection 4 (Fall 13)

FIGURE 6F

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (OVERBURDEN)

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



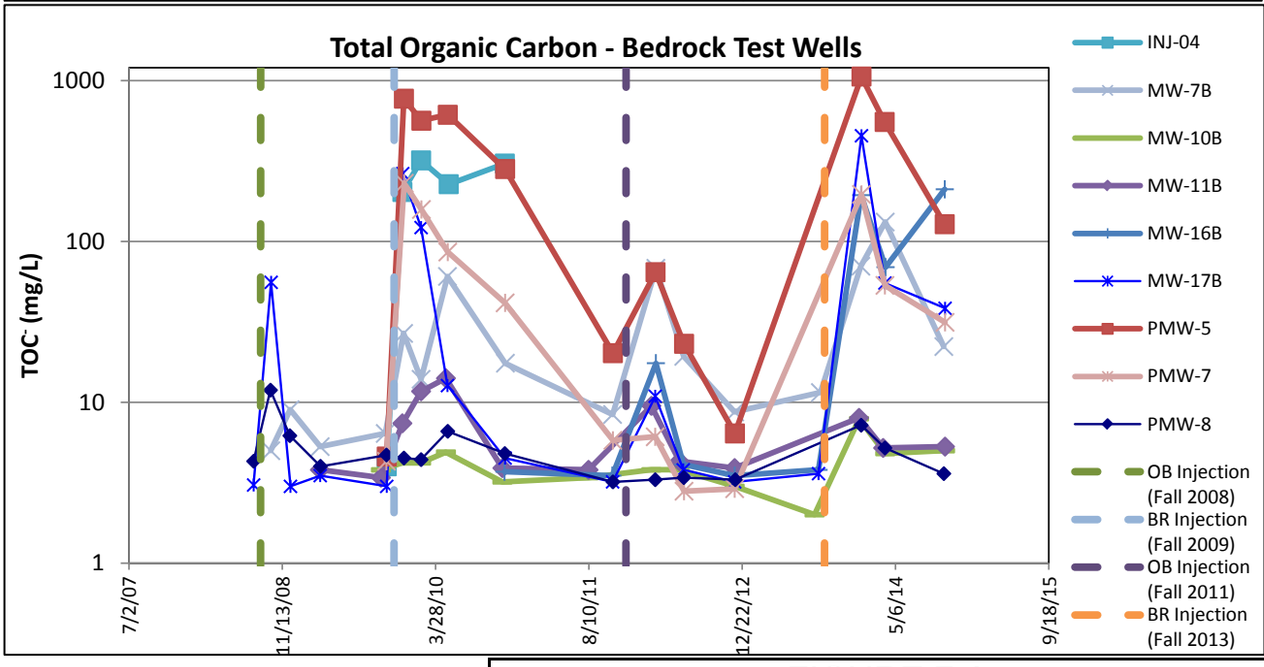


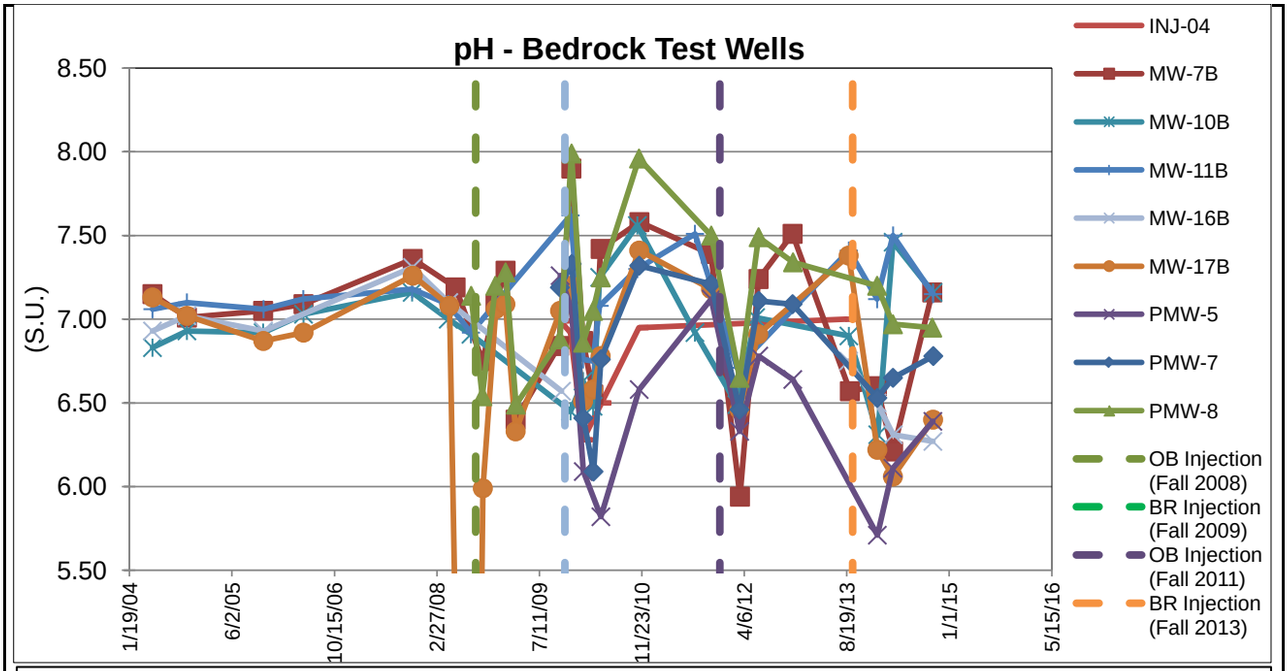
FIGURE 7 A

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY

TRENDS OF GEOCHEMICAL INDICATORS IN SELECTED BEDROCK WELLS

PARSONS

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



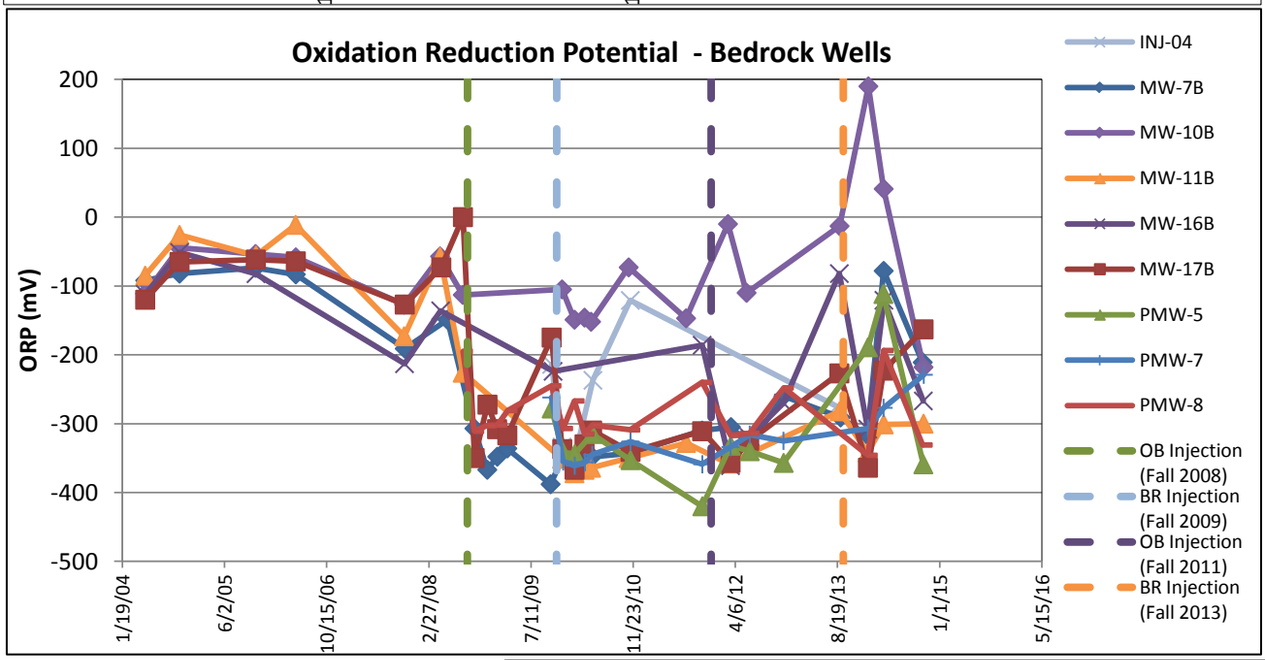
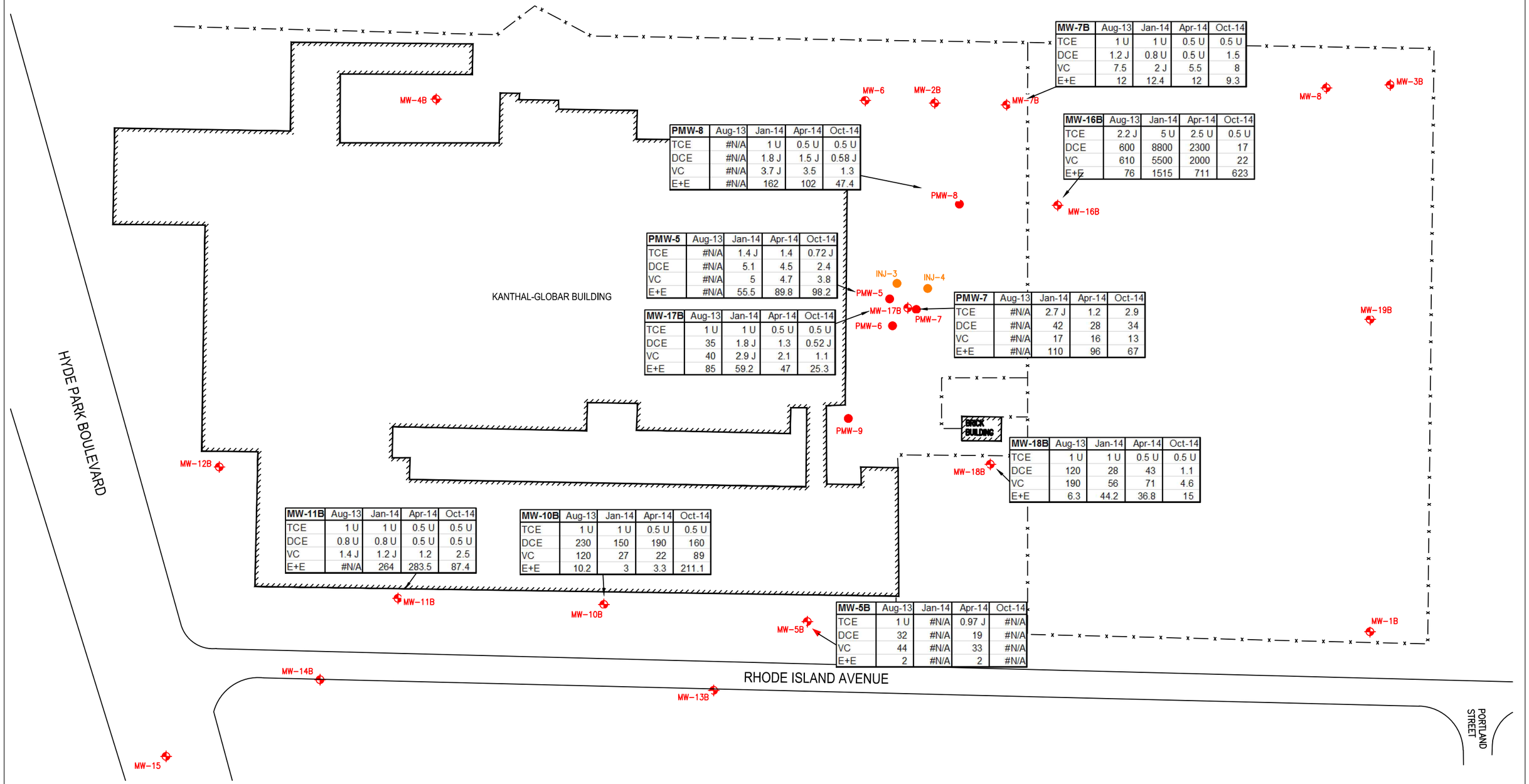


FIGURE 7 B

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NY

TRENDS OF GEOCHEMICAL INDICATORS
IN SELECTED BEDROCK WELLS

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



MW-7B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	1.2 J	0.8 U	0.5 U	1.5
VC	7.5	2 J	5.5	8
E+E	12	12.4	12	9.3

MW-16B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	2.2 J	5 U	2.5 U	0.5 U
DCE	600	8800	2300	17
VC	610	5500	2000	22
E+E	76	1515	711	623

PMW-8	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1 U	0.5 U	0.5 U
DCE	#N/A	1.8 J	1.5 J	0.58 J
VC	#N/A	3.7 J	3.5	1.3
E+E	#N/A	162	102	47.4

PMW-5	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	1.4 J	1.4	0.72 J
DCE	#N/A	5.1	4.5	2.4
VC	#N/A	5	4.7	3.8
E+E	#N/A	55.5	89.8	98.2

MW-17B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	35	1.8 J	1.3	0.52 J
VC	40	2.9 J	2.1	1.1
E+E	85	59.2	47	25.3

PMW-7	Aug-13	Jan-14	Apr-14	Oct-14
TCE	#N/A	2.7 J	1.2	2.9
DCE	#N/A	42	28	34
VC	#N/A	17	16	13
E+E	#N/A	110	96	67

MW-18B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	120	28	43	1.1
VC	190	56	71	4.6
E+E	6.3	44.2	36.8	15

MW-11B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	0.8 U	0.8 U	0.5 U	0.5 U
VC	1.4 J	1.2 J	1.2	2.5
E+E	#N/A	264	283.5	87.4

MW-10B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	1 U	0.5 U	0.5 U
DCE	230	150	190	160
VC	120	27	22	89
E+E	10.2	3	3.3	211.1

MW-5B	Aug-13	Jan-14	Apr-14	Oct-14
TCE	1 U	#N/A	0.97 J	#N/A
DCE	32	#N/A	19	#N/A
VC	44	#N/A	33	#N/A
E+E	2	#N/A	2	#N/A

LEGEND:

- PROPERTY LINE
- FENCE
- MW-5B — BEDROCK MONITORING WELL LOCATION
- PMW-1 — BEDROCK PERFORMANCE MONITORING WELL LOCATION
- INJ-3 — BEDROCK INJECTION WELL LOCATION

CONCENTRATIONS IN ug/L (ppb)
#N/A = NOT SAMPLED

SAMPLE DATE	
TCE	TRICHLOROETHENE
DCE	CIS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
E+E	ETHANE + ETHENE

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

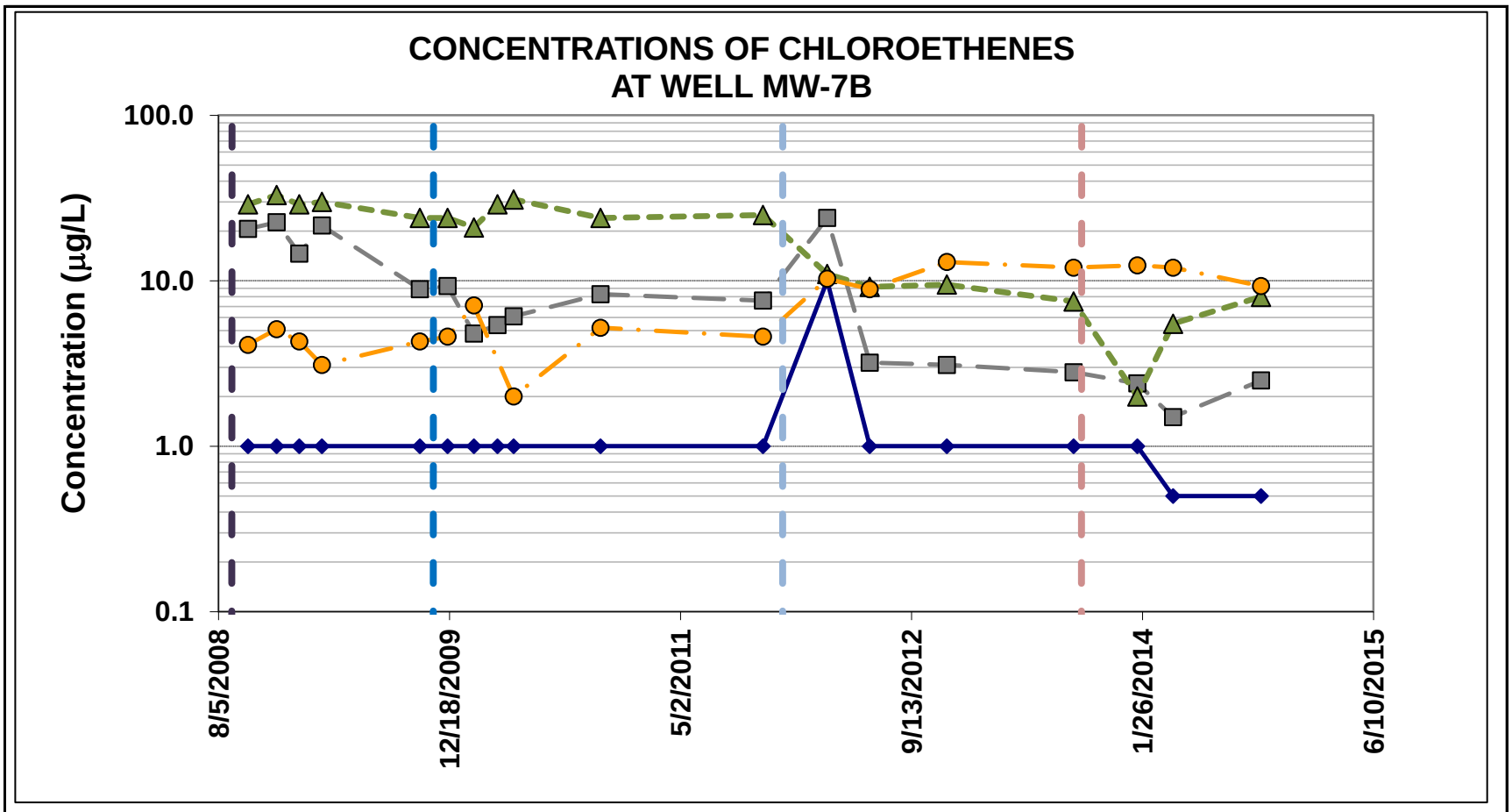
\\nybuf03fs01\pctgprojects\Hyde Park\446849\graphics\CAD\Hyde_CAD(link)_updated May 2014.dwg

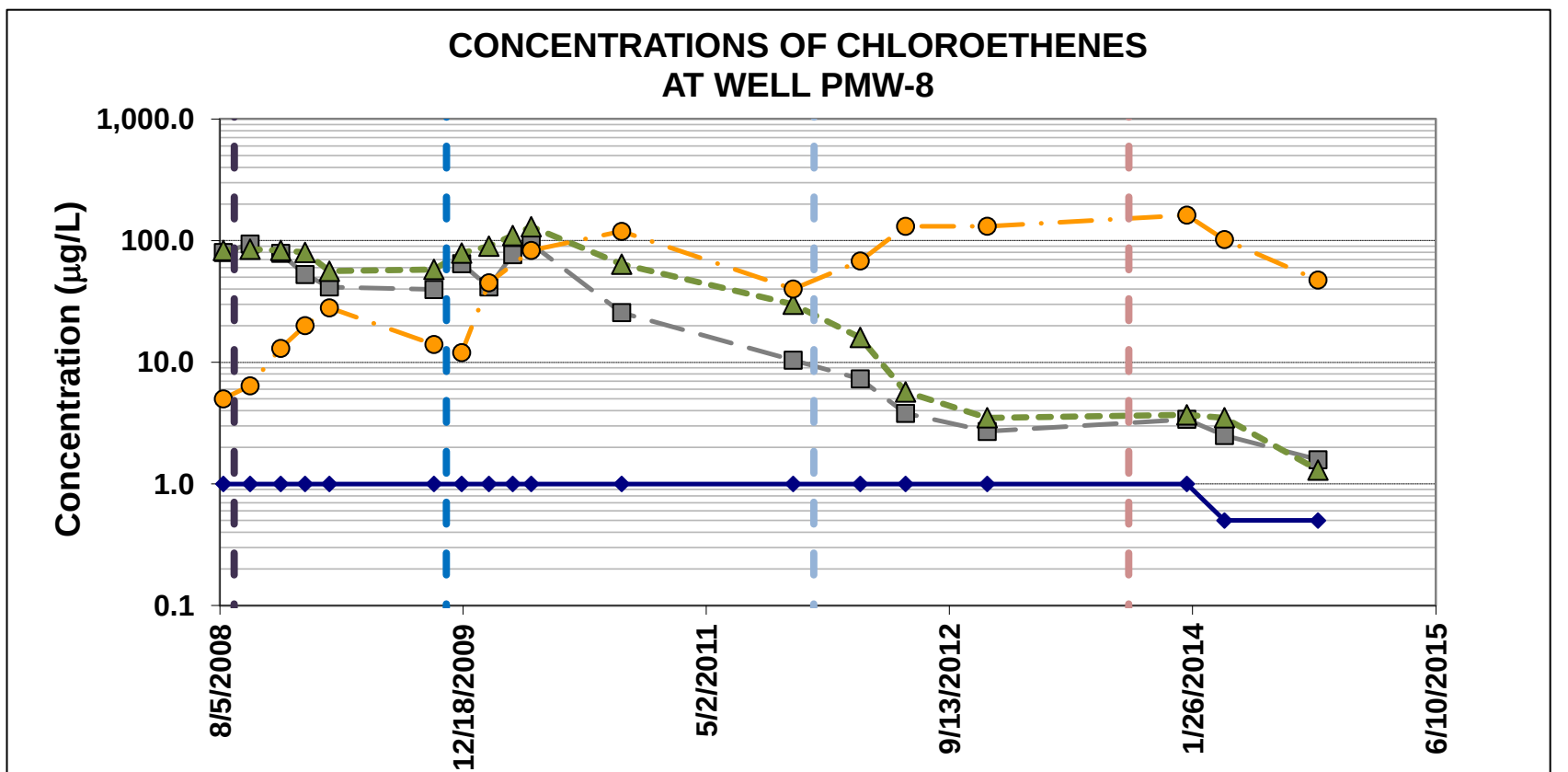
FIGURE 8

FORMER CARBORUNDUM COMPANY
ELECTRIC PRODUCTS DIVISION
TOWN OF NIAGARA, NEW YORK

VOC CONCENTRATIONS IN BEDROCK GROUNDWATER

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





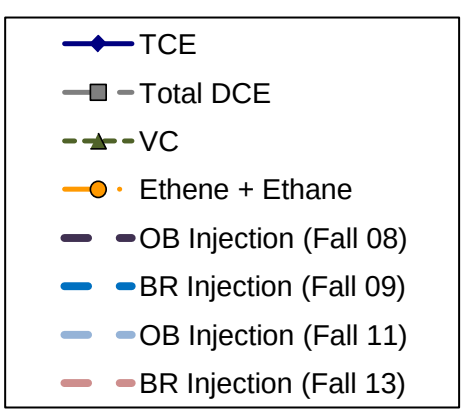


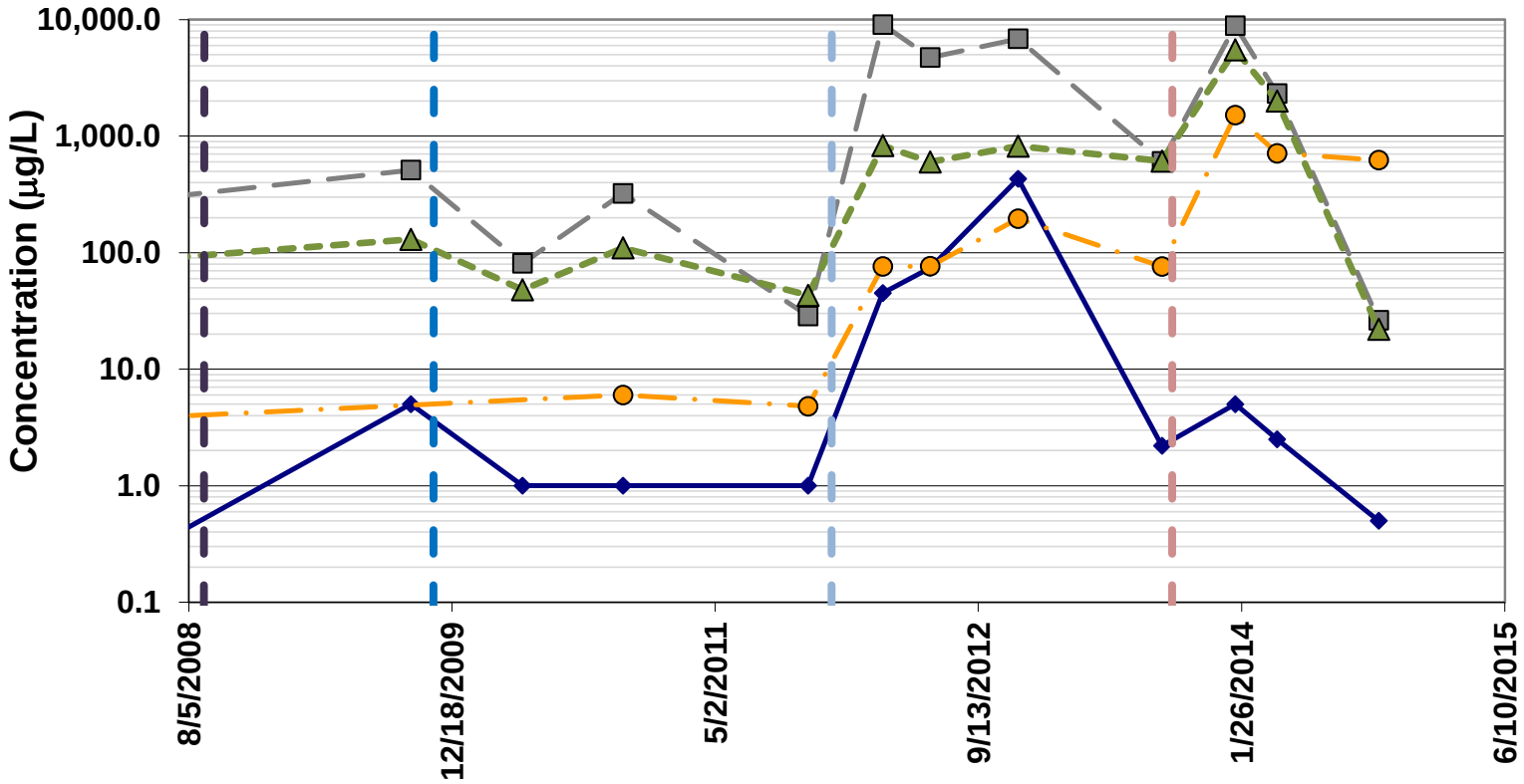
FIGURE 9A

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

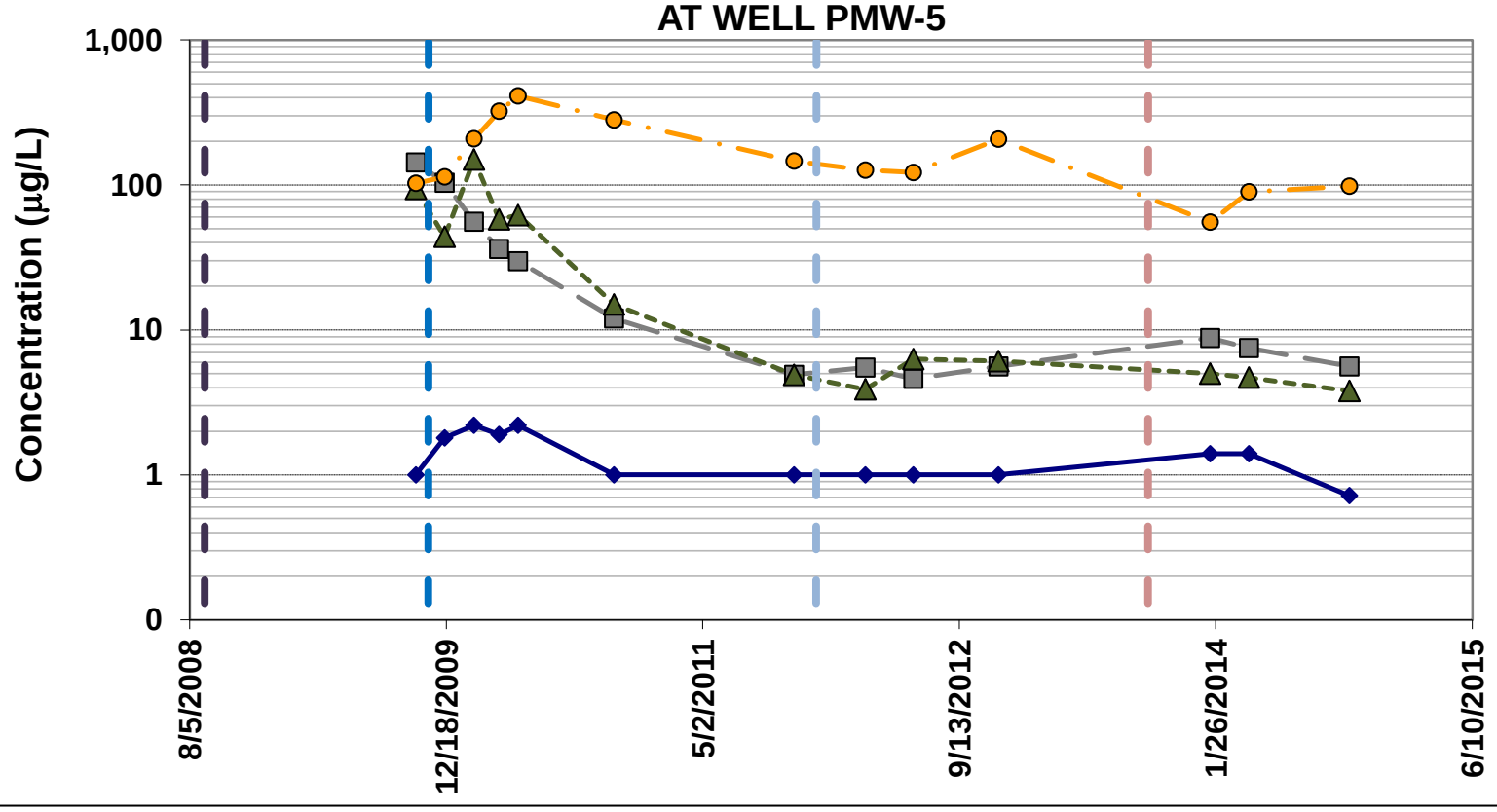
TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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

CONCENTRATIONS OF CHLOROETHENES AT WELL MW-16B



CONCENTRATIONS OF CHLOROETHENES AT WELL PMW-5



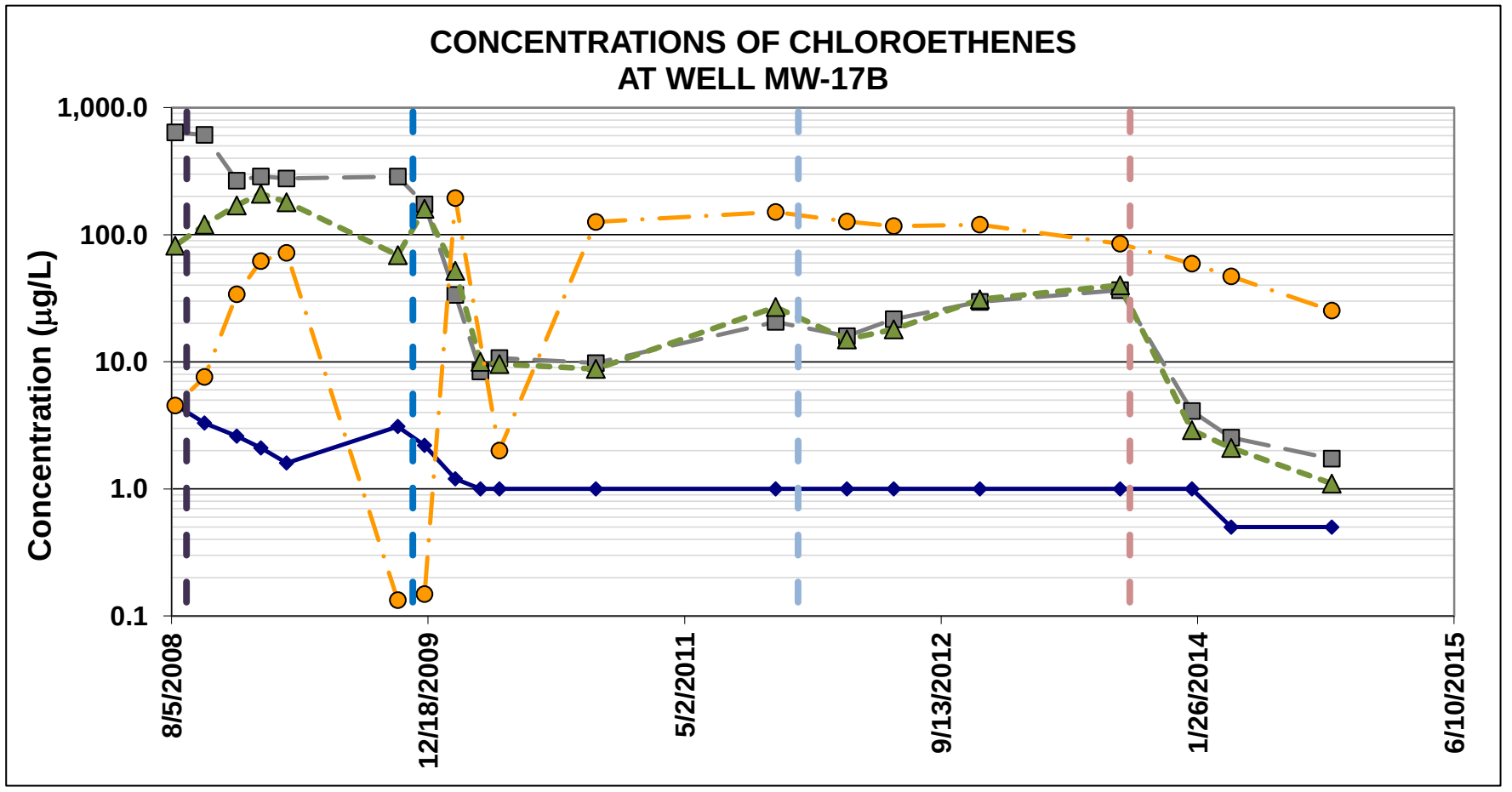
TCE
Total DCE
VC
Ethene + Ethane
OB Injection (Fall 08)
BR Injection (Fall 09)
OB Injection (Fall 11)
BR Injection (Fall 13)

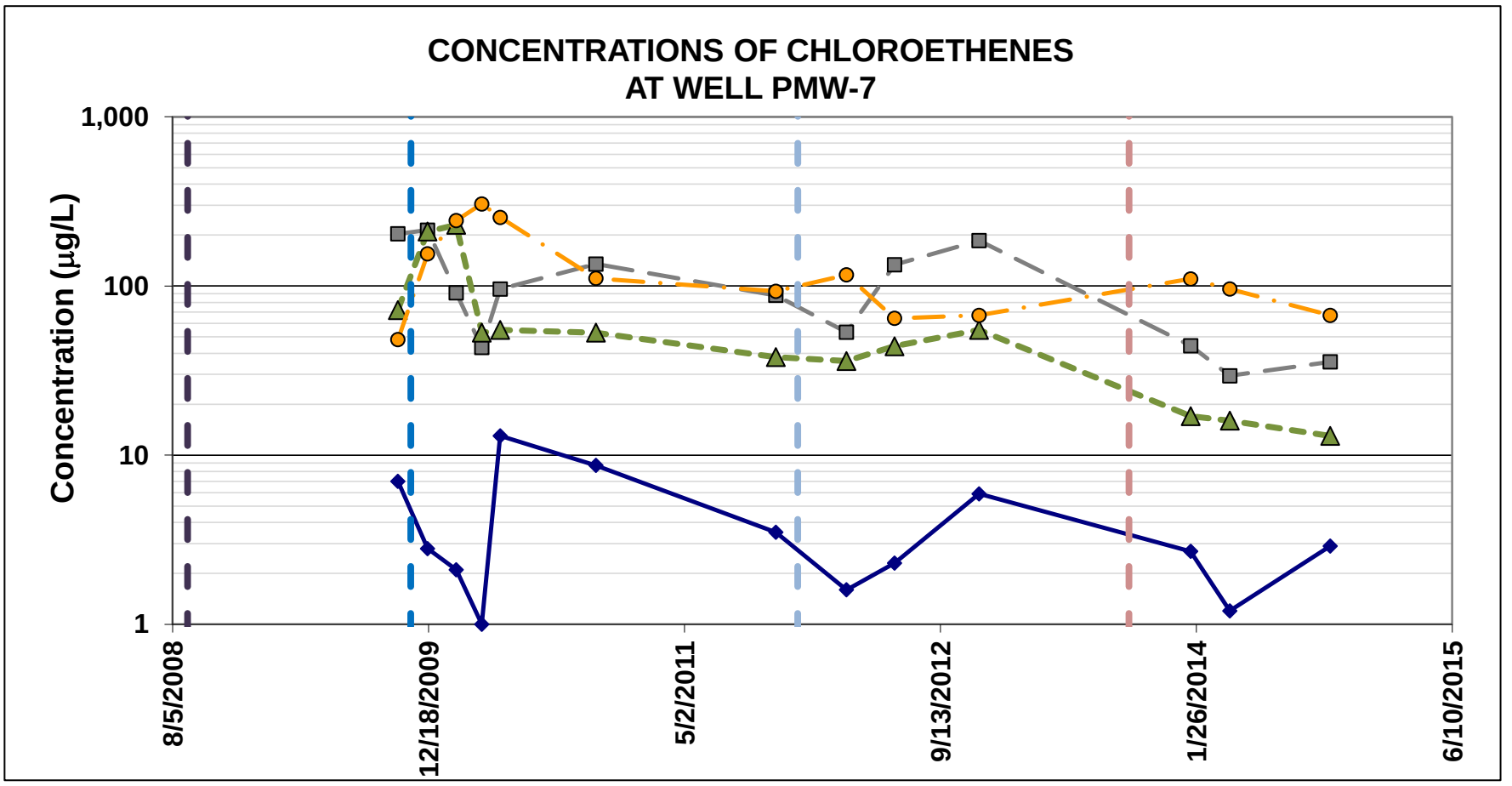
FIGURE 9B

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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





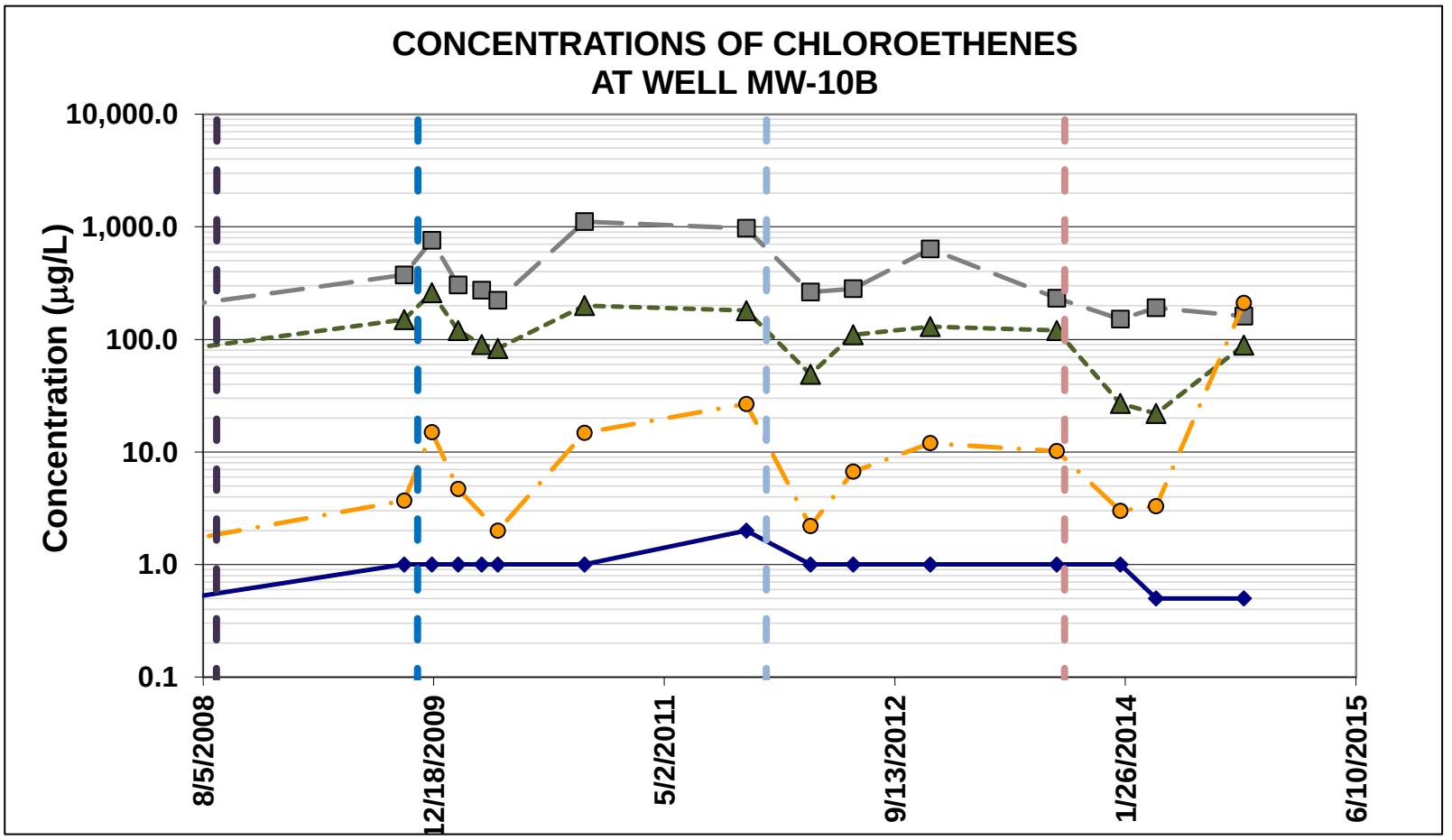
TCE
Total DCE
VC
Ethene + Ethane
OB Injection (Fall 08)
BR Injection (Fall 09)
OB Injection (Fall 11)
BR Injection (Fall 13)

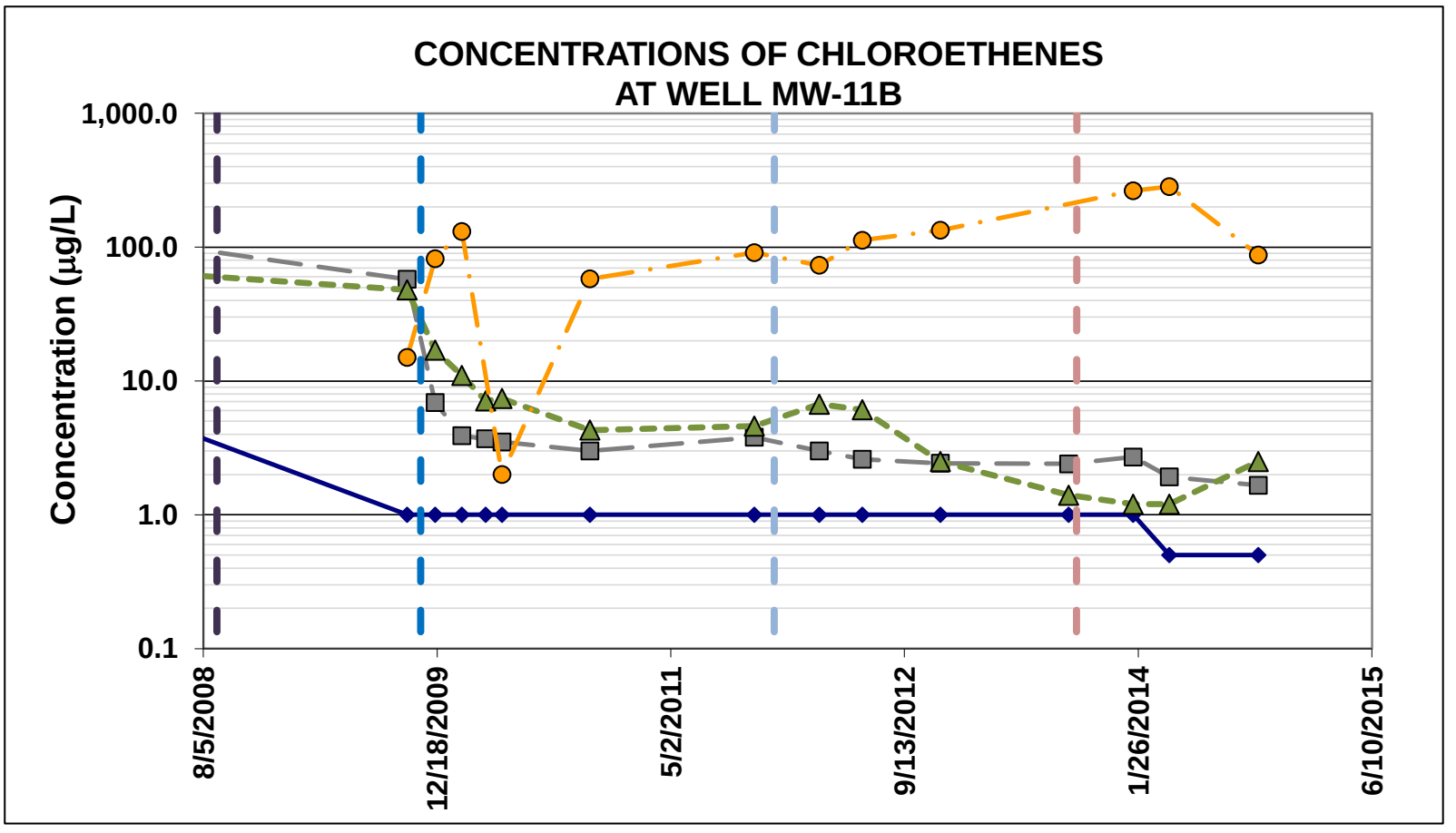
FIGURE 9C

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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





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

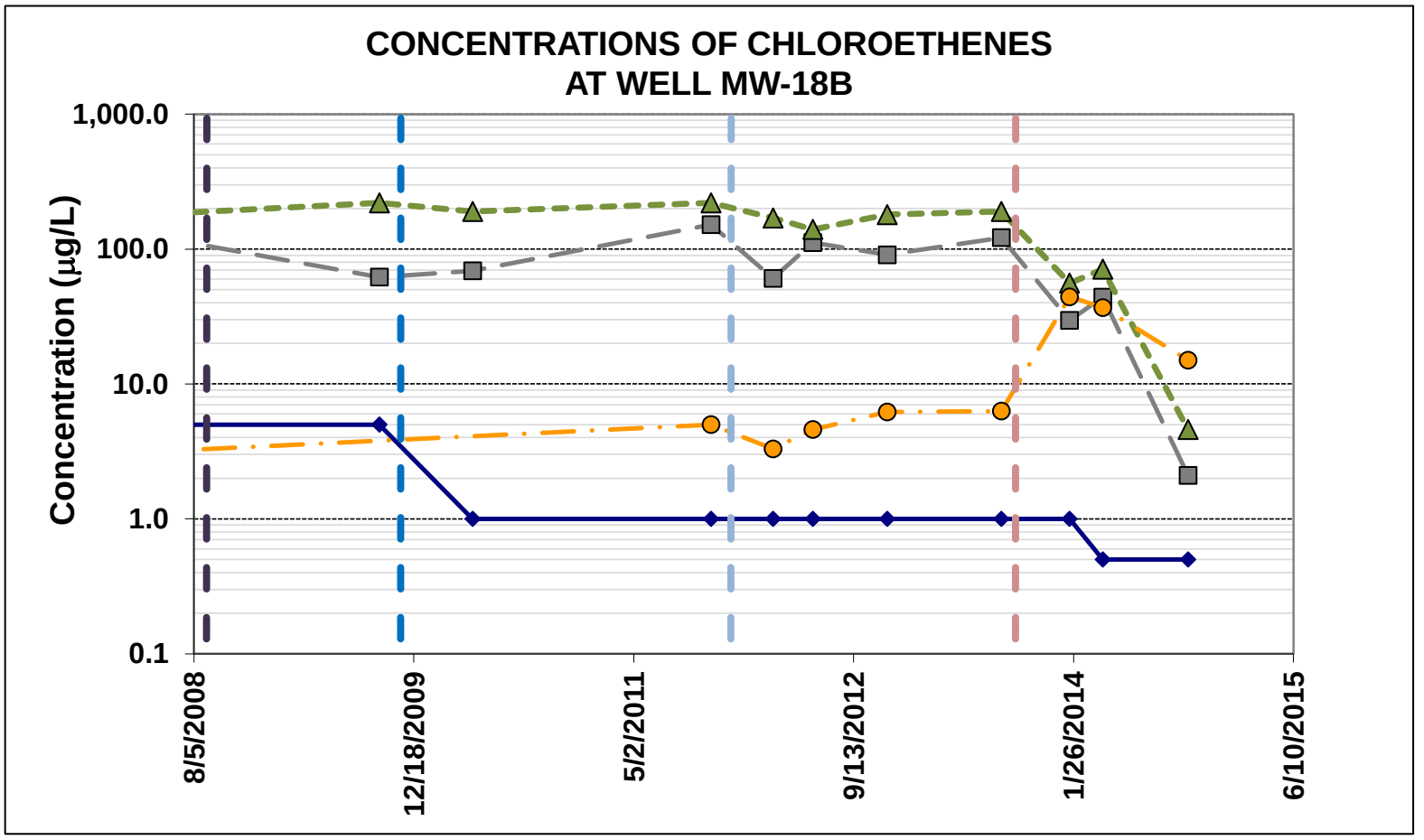
TCE
Total DCE
VC
Ethene + Ethane
OB Injection (Fall 08)
BR Injection (Fall 09)
OB Injection (Fall 11)
BR Injection (Fall 13)

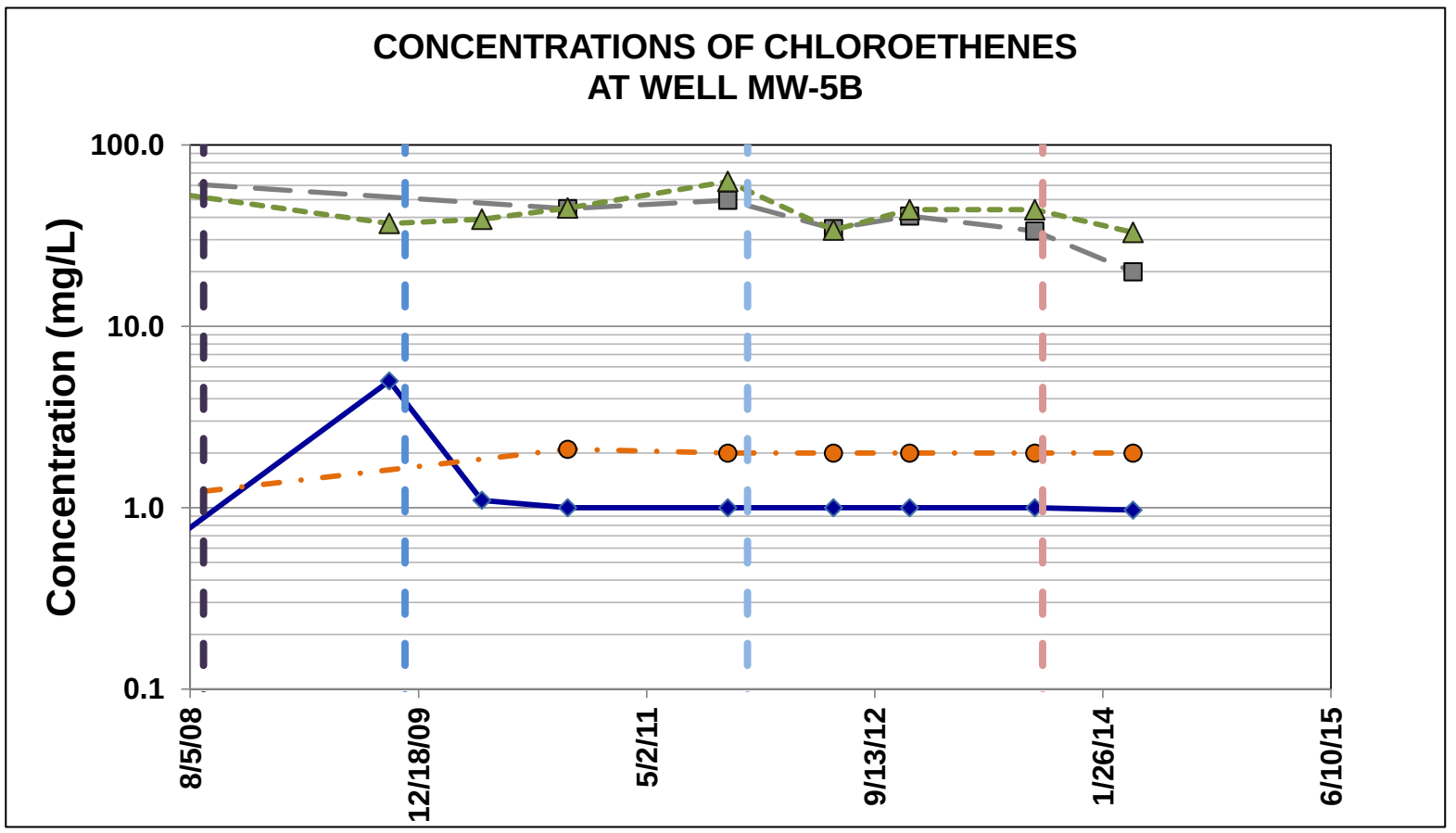
FIGURE 9D

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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





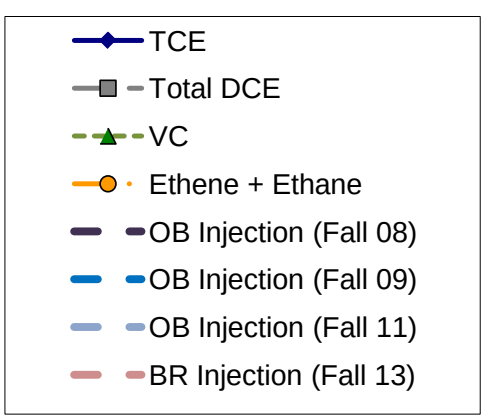
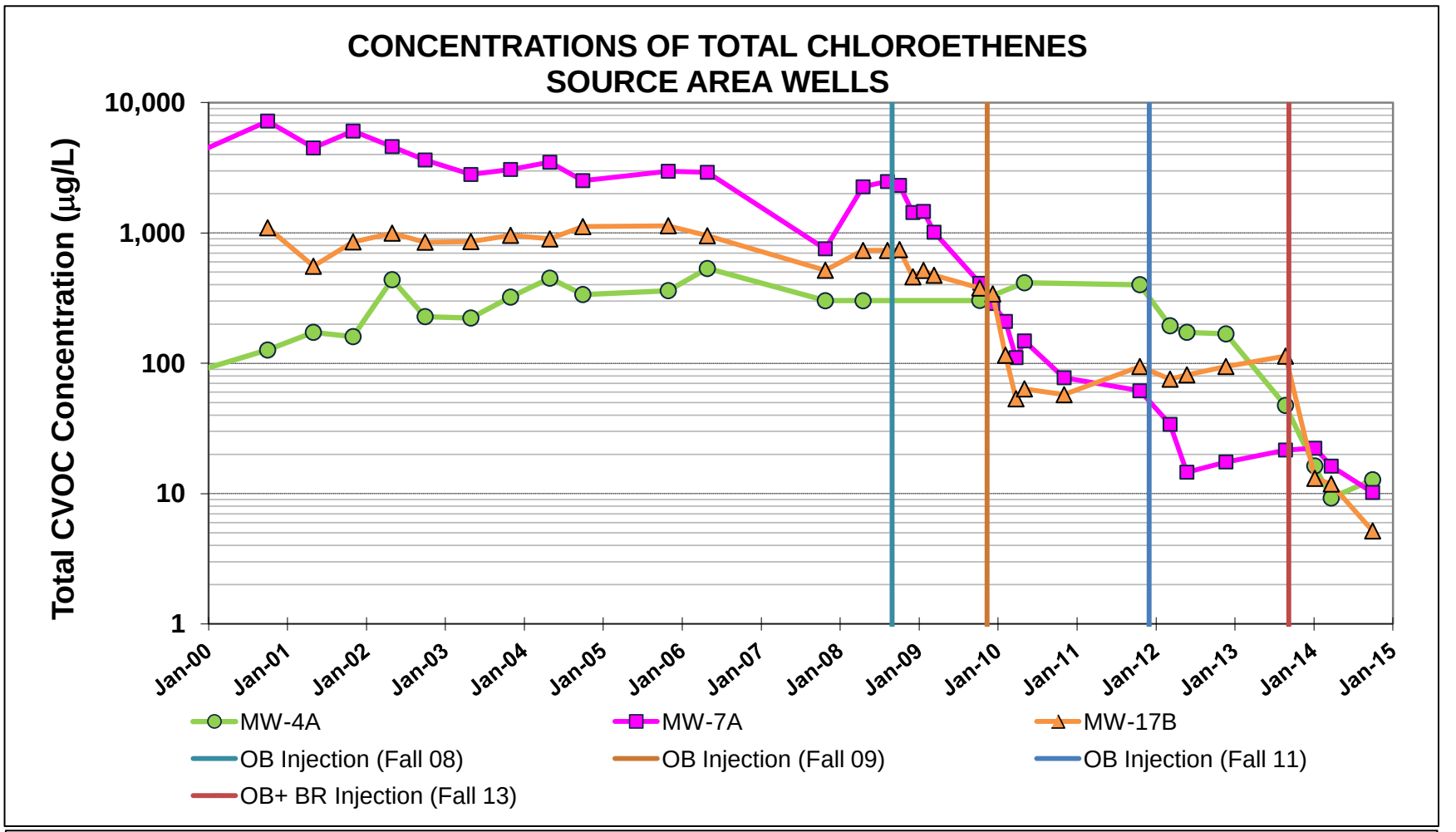


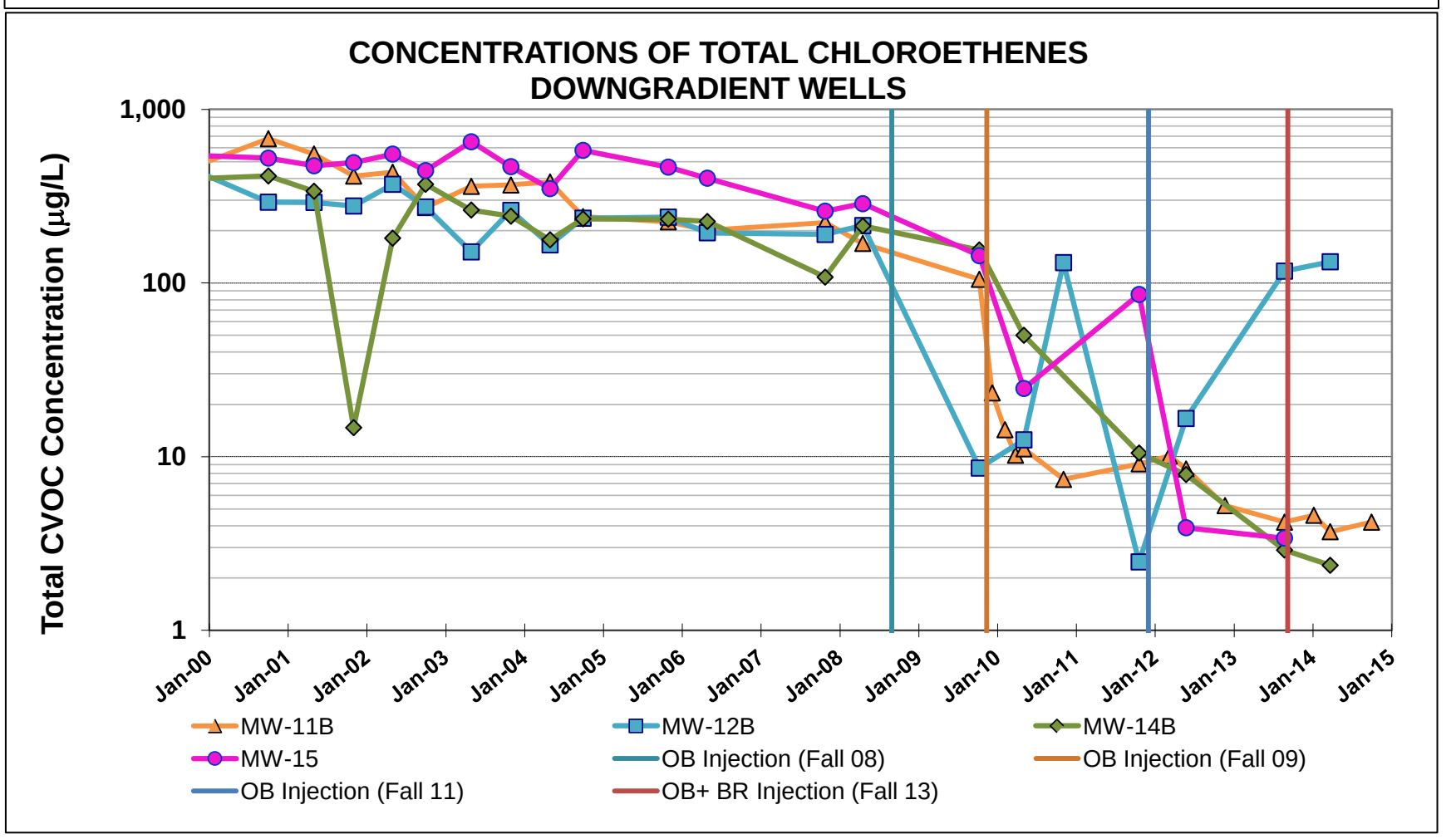
FIGURE 9E

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NY

TRENDS OF CHLORINATED ETHENES IN SELECTED WELLS (BEDROCK)

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





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

FIGURE 10

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

TABLES

Table 1

Sample Matrix for 3-Month, 6-Month, and 12-Month Perfomance Sampling Events

Location		VOCs[a/] (SW8260B)	Methane, Ethane, Ethene[b/]	Bromide (300.1)	Chloride, Sulfate (300.1)	Total Organic Carbon (5310C)	Dissolved Organic Carbon (5310C)	Dissolved Iron (6010B)	Sulfide (SM204500)	Microbial Population [c/] (Lab SOP)	Well Head Analyses [d/]	Field Analyses (Hach Kits) [e/]
Existing Site Investigation Monitoring Wells												
MW-4A	overburden	1	1	1	1	1	1	1	1	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
MW-10B	bedrock	1	1	1	1	1	1	1	1		1	1
MW-11B	bedrock	1	1	1	1	1	1	1	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
MW-17B	bedrock	1	1	1	1	1	1	1	1		1	1
MW-18B	bedrock	1	1	1	1	1	1	1	1	1	1	1
Performance Monitoring Wells												
PMW-1	overburden	1	1	1	1	1	1	1	1		1	1
PMW-2	overburden	1	1	1	1	1	1	1	1		1	1
PMW-3	overburden	1	1	1	1	1	1	1	1	1	1	1
PMW-4	overburden	1	1	1	1	1	1		1		1	1
PMW-5	bedrock	1	1	1	1	1	1	1	1	1	1	1
PMW-7	bedrock	1	1	1	1	1	1	1	1		1	1
PMW-8	bedrock	1	1	1	1	1	1		1		1	1
PMW-9	bedrock	1	1	1	1	1	1		1		1	1
Injection Points												
INJ-1	overburden	1	1	1	1	1	1	1	1	1	1	1
INJ-2	overburden	1	1	1	1	1	1	1	1		1	1
INJ-5U	overburden - upper	1	1	1	1	1	1	1	1	1	1	1
INJ-5L	overburden - lower	1	1	1	1	1	1	1	1	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 PMW-90 or MW-150.												
No MS/MSD or field duplicate samples will be collected for microbe analysis.												

Notes:

Microbial population only sampled during the 3-month (January 2014) and 12-month (October 2014) performance sampling events.

[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/] Microbial population composition will include concentration of dehalococcoides and dehalobacter species in cells per milliliter, and TCE and VC reductase.

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

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

TABLE 2
MICROBIAL CONCENTRATION SUMMARY
HYDE PARK SITE
NIAGARA FALLS, NY

Well ID	Sampling Date	DHC cells/mL	DHB cells/mL
Overburden Wells			
INJ-01	13-Aug-08	2.05E+00	9.71E-01
	8-Oct-08	1.18E+02	2.69E+03
	17-Mar-09	4.88E+03	6.54E+01
	15-Oct-09	1.51E+04	3.73E+04
	14-Dec-09	2.70E+04	7.37E+03
	10-May-10	2.58E+04	2.28E+01
	10-Nov-10	8.61E+03	1.90E+00
	27-Oct-11	2.04E+04	4.20E+03
	15-Mar-12	2.01E+04	3.86E+02
	28-Nov-12	4.42E+02	9.10E+00
	1/16/2014	5.04E+02	3.97E+02
	10/9/2014	7.18E+03	7.53E+01
PMW-3	8/13/2008	6.27E+00	2.25E+02
	10/8/2008	3.90E+02	3.77E+03
	3/17/2009	2.75E+04	4.01E+01
	10/15/2009	2.81E+04	2.13E+04
	12/14/2009	6.82E+04	4.20E+04
	5/7/2010	4.81E+04	5.00E-01
	11/10/2010	1.37E+04	5.90E+00
	3/14/2012	8.24E+04	6.72E+01
	11/29/2012	9.00E-01	5.40E+00
	1/14/2014	1.68E+03	9.89E+01
	10/13/2014	3.56E+05	4.98E+02
MW-7A	8/12/2008	2.52E+01	6.19E+00
	10/8/2008	9.12E+01	7.35E+03
	3/17/2009	4.04E+03	3.55E+01
	10/15/2009	3.41E+04	6.80E+04
	12/14/2009	4.26E+03	9.03E+04
	5/6/2010	7.44E+02	2.01E+03
	11/10/2010	6.76E+02	8.80E+01
	10/27/2011	2.98E+02	2.58E+02
	3/14/2012	3.44E+04	2.19E+03
	11/28/2012	3.00E+02	6.00E+00
	1/15/2014	2.39E+02	1.09E+01
	10/9/2014	1.90E+04	1.28E+02

TABLE 2
MICROBIAL CONCENTRATION SUMMARY
HYDE PARK SITE
NIAGARA FALLS, NY

Well ID	Sampling Date	DHC cells/mL	DHB cells/mL
Overburden Wells			
INJ-5U	3/13/2012	1.41E+05	1.89E+04
	11/27/2012	5.02E+04	1.51E+01
	1/15/2014	7.90E+04	1.08E+03
	10/14/2014	9.80E+04	1.46E+02
INJ-5L	3/13/2012	5.85E+03	5.83E+03
	11/27/2012	8.08E+03	1.39E+02
	1/15/2014	1.08E+01	6.90E+00
	10/14/2014	3.94E+03	4.20E+00
MW-4A	10/26/2011	3.00E-01	8.80E+00
	3/13/2012	1.04E+05	2.93E+04
	11/27/2012	7.79E+04	3.44E+03
	1/15/2014	2.22E+03	9.70E+00
	10/14/2014	8.54E+04	4.34E+03
Bedrock Wells			
MW-18B	10/26/2011	7.86E+01	4.92E+01
	3/13/2012	5.70E+02	1.50E+01
	11/27/2012	4.00E-01	3.00E+00
	1/15/2014	2.85E+03	8.60E+02
	10/14/2014	3.16E+03	7.48E+01
PMW-5	10/20/2009	7.86E+03	2.01E+04
	12/15/2009	2.98E+03	4.51E+03
	5/7/2010	9.52E+03	2.60E+00
	11/10/2010	1.12E+04	7.40E+00
	10/27/2011	2.92E+03	1.73E+03
	3/14/2012	1.34E+04	6.19E+01
	11/28/2012	7.16E+03	1.09E+01
	1/15/2014	2.73E+01	3.00E-01
	10/13/2014	1.55E+04	1.48E+02

Notes:

#NA = Not Applicable, no sample collected.

DHC = *Dehalococcoides* species of bacteria

DHB = *Dehalobacter* species of bacteria

APPENDIX A

GROUNDWATER SAMPLING LOGS

OCTOBER 2014 12-MONTH PERFORMANCE MONITORING

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: INJ-1

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):	Depth to Well Bottom (ft):
8.32	

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

Purging Data

Method: Low flow

Date: 10/09/2014

Time: 13:10 *(hhmm)*

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
13:10	8.32	200	0	7.21	0.04	Or	1.49	20.77	0.972	12	Substrate
13:20	8.91	200	0.5	6.78	0.0	44.0	1.60	15.81	1.03	5	Milky
13:30	8.99	200	1.0	6.73	0.0	31.4	1.63	15.86	1.05	-2	Same
13:40	9.17	200	1.5	6.71	0.0	22.3	1.67	15.84	1.06	-16	Clear
13:45	9.22	200	1.7	6.70	0.0	24.3	1.67	15.75	1.06	-24	Substrate odor
13:50	9.29	200	1.9	6.70	0.0	22.2	1.66	15.60	1.07	-32	Same
13:55	9.34	200	2.1	6.69	0.0	19.9	1.71	15.58	1.09	-40	Same
14:00	9.43	200	2.3	6.69	0.0	24.4	1.70	15.56	1.09	-51	Same
14:05	9.47	180	2.5	6.71	0.0	22.1	1.70	15.63	1.09	-65	Same
14:10	9.51	180	2.7	6.74	0.0	20.6	1.71	15.79	1.09	-79	Same
14:15	9.57	180	3.0	6.72	0.0	21.4	1.72	15.75	1.10	-89	
14:20	9.63	180	3.2	6.73	0.0	20.0	1.74	15.71	1.12	-99	Same
14:25	9.65	180	3.4	6.72	0.0	18.3	1.75	15.62	1.13	-107	
14:30	9.69	180	3.7	6.71	0.0	19.1	1.76	15.52	1.13	-108	Same

Method: Dedicated tubing

Date: 10/09/2014

Time: *(hhmm)* 14:30

Total Volume of Water Purged: 3.7 (gal)

STABILIZED PARAMETERS	
pH	6.71
Spec. Cond.(mS/cm)	1.76
Turbidity (NTU)	19.1
DO (mg/L)	0.0
Temp.(°C)	15.52
ORP (mv)	-108
TDS (g/L)	1.13

HACH TEST KITS	
Alkalinity (g/g)	960
Carbon Dioxide (mg/L)	530
Ferrous Iron (mg/L)	2.6
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	2
DTW (ft)	9.69

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: INJ-2

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): 7.97

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/10/2014

Time: 08:55 *(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
08:55	7.97	200	0.0	6.42	4.62	147	1.71	12.86	1.09	19	Substrate
9:05	8.49	200	0.5	6.58	0.0	172	1.65	13.80	1.05	-59	Odor
09:15	8.69	200	1.0	6.61	0.0	19.9	1.66	13.80	1.06	-79	Water
09:25	8.80	200	1.5	6.60	0.0	12.64	1.66	13.75	1.06	-90	Turning
09:30	8.86	200	1.7	6.61	0.0	12.46	1.67	13.79	1.07	-94	Black
09:35	8.92	200	1.9	6.62	0.0	24.4	1.68	13.83	1.08	-97	Normally
09:40	8.93	200	2.2	6.61	0.0	20.3	1.69	13.87	1.08	-101	Clear
09:45	8.94	200	2.4	6.61	0.0	19.7	1.70	13.91	1.09	-102	
09:50	8.95	200	2.6	6.60	0.0	22.4	1.72	13.93	1.10	-104	

Method: Dedicated tubing

Date: 10/10/2014

Time: *(hhmm)* 09:50

Total Volume of Water Purged: 2.6 (gal)

STABILIZED PARAMETERS	
pH	6.6
Spec. Cond.(mS/cm)	1.72
Turbidity (NTU)	22.4
DO (mg/L)	0.0
Temp.(°C)	13.93
ORP (mv)	-104
TDS (g/L)	1.10

HACH TEST KITS	
Alkalinity (g/g)	940
Carbon Dioxide (mg/L)	790
Ferrous Iron (mg/L)	2.4
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	0.7
DTW (ft)	8.95

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: INJ-5L

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): 8.12

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/09/2014

Time: 1245 *(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
1245	8.56	100	0	6.75	1.40	64.2	2.20	17.03	1.41	-24	
1250	8.58	100	0.13	6.70	0.29	54.4	2.26	16.77	1.45	-33	
1255	8.61	100	0.27	6.64	0.00	37.4	2.31	16.11	1.48	-46	
1300	8.63	200	0.40	6.63	0.00	33.7	2.34	15.96	1.50	-52	
1315	8.71	200	0.80	6.63	0.00	23.2	2.37	15.48	1.52	-71	
1320	8.99	100	0.93	6.65	0.00	21.4	2.37	15.46	1.52	-78	
1325	8.62	100	1.06	6.66	0.00	26.8	2.37	15.53	1.51	-84	
1335	8.46	200	1.70	6.66	0.0	23.7	2.34	15.57	1.50	-91	
1345	8.83	300	2.50	6.75	0	18.4	2.29	15.03	1.47	-109	
1355	8.81	200	3.0	6.75	0	24.5	2.27	15.93	1.45	-115	
1400	8.80	200	3.27	6.75	0	22.7	2.25	16.0	1.44	-118	

Method: Dedicated tubing

Date: 10/09/2014

Time: *(hhmm)* 1400

Total Volume of Water Purged: 3.27 (gal)

STABILIZED PARAMETERS	
pH	6.75
Spec. Cond.(mS/cm)	2.25
Turbidity (NTU)	32
DO (mg/L)	0
Temp.(°C)	16.0
ORP (mv)	-118
TDS (g/L)	1.44

HACH TEST KITS	
Alkalinity (g/g)	640
Carbon Dioxide (mg/L)	570
Ferrous Iron (mg/L)	3
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	1.5
DTW (ft)	8.8

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: INJ-5U

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): 7.95

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/09/2014

Time: 1000 *(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
10:10	10.96	200	0.53	6.94	0.04	36.7	2.34	15.19	1.50	-108	Clear
10:20	14.46	100	0.80	6.98	0.0	46.1	2.35	15.10	1.51	-105	No odor
1100	12.23	110	2.33	6.94	0.0	32.5	2.13	15.34	1.36	-89	
1120	12.25	100	3.32	6.86	0.0	27.2	2.06	15.52	1.31	-85	

Method: Dedicated tubing

Date: 10/09/2014

Time: *(hhmm)* 1120

Total Volume of Water Purged: 3.32 (gal)

STABILIZED PARAMETERS	
pH	6.86
Spec. Cond.(mS/cm)	2.06
Turbidity (NTU)	27.2
DO (mg/L)	0.0
Temp.(°C)	15.52
ORP (mv)	-85
TDS (g/L)	1.31

HACH TEST KITS	
Alkalinity (g/g)	740
Carbon Dioxide (mg/L)	766
Ferrous Iron (mg/L)	1.6
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0
DTW (ft)	12.25

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: MW-4A

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): 5.56

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/15/2014

Time: 0920 *(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
0920	580	150	0.20	6.79	0.37	67.4	2.30	16.98	1.47	-9	Pump shuts off lower ...
0925	7.20	150	0.40	6.89	0	49.8	2.35	16.95	1.50	-28	
0930	9.2	150	0.60	6.84	0.00	43.5	2.33	16.36	1.49	-32	
0935	10.1	150	0.80	6.85	0	42.4	2.33	16.70	1.49	-37	
0940	11.71	150	1.00	6.35	0	34.5	2.30	16.87	1.48	-39	
0945	12.21	150	1.2	6.38	0	26.9	2.29	17.18	1.46	-39	
0950	12.92	150	1.4	6.83	0	32.6	2.28	17.41	1.46	-39	
0955	13.6	150	1.6	6.81	0	35.8	2.27	17.63	1.46	-39	
1000	14.1	150	1.8	6.89	0	36.7	2.28	18.03	1.46	-40	
1005	14.16	150	2.0	6.83	0	32.5	2.30	18.17	1.47	-40	
1010	15.5	150	2.2	6.81	0	30.8	2.29	18.22	1.47	-40	
1015	15.9	150	2.4	6.82	0	31.3	2.30	18.32	1.48	-27	
1020	16.5	150	2.6	6.83	0	32.3	2.33	18.22	1.49	-12	
1025	17.3	150	2.8	6.8	0	37.6	2.32	17.95	1.48	-16	
1030	18.4	150	3.0	6.82	0	Na	2.45	16.64	1.57	-7	Dry

Method: Dedicated tubing

Date: 10/14/2014

Time: *(hhmm)* 1640

Total Volume of Water Purged: 3 (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)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	2
DTW (ft)	

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

water too muddy

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-7A

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): 6.24

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/09/2014

Time: 09:55 *(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
09:55	6.24	200	0.0	6.86	1.74	Or	2.02	14.16	1.30	45	Substrate
10:05	8.98	200	0.5	6.93	1.55	763	1.98	14.26	1.27	15	Ame
10:15	11.66	200	1.0	6.98	1.10	766	2.00	14.59	1.28	-2	Gray, substrate odor
10:25	12.85	80	1.2	7.06	0.0	1369	2.00	14.90	1.28	24	Same
10:35	14.11	80	1.3	7.05	0.0	604	2.00	15.20	1.28	10	
10:45	15.70	80	1.5	7.04	0.0	53	2.01	15.31	1.28	3	
10:55	16.52	80	1.6	7.03	0.0	94.0	2.01	15.42	1.29	-1	
11:05	17.64	80	1.8	7.02	0.0	59	2.02	15.48	1.30	-2	
11:15	18.71	80	1.9	6.99	0.0	84.7	2.04	15.50	1.30	-2	
11:25	20.02	80	2.1	6.96	0.0	79.0	2.05	15.52	1.31	0	
11:35	20.88	80	2.2	6.90	0.0	35	2.03	15.61	1.30	3	
11:45	21.35	80	2.3	6.87	0.0	118	2.03	15.89	1.29	6	Dry

Method: Dedicated tubing

Date: 10/09/2014

Time: *(hhmm)* 1620

Total Volume of Water Purged: (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)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	
DTW (ft)	

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-10B

Manual Entry:

Well Diameter: 4 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 9.6

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/14/2014

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	9.60	200	0.0	6.73	0.27	23.6	1.36	16.90	0.871	-138	Clear
09:20	9.60	200	0.5	7.11	0.0	8.54	1.34	16.06	0.854	-206	No
09:30	9.61	200	1.0	7.11	0.0	3.74	1.33	16.14	0.856	-212	Odor
09:40	9.60	200	1.5	7.09	0.0	1.32	1.33	16.18	0.852	-220	Same
09:45	9.60	200	1.7	7.11	0.0	2.33	1.33	16.20	0.850	-221	
09:50	9.61	200	2.0	7.12	0.0	1.65	1.33	16.23	0.849	-223	
09:55	9.61	200	2.2	7.14	0.0	1.32	1.33	16.31	0.847	-220	
10:00	9.61	200	2.4	7.16	0.0	0.29	1.32	16.40	0.845	-218	

Method: Dedicated tubing

Date: 10/14/2014

Time: *(hhmm)* 10:00

Total Volume of Water Purged: 2.4 (gal)

STABILIZED PARAMETERS	
pH	7.16
Spec. Cond.(mS/cm)	1.32
Turbidity (NTU)	0.29
DO (mg/L)	0.0
Temp.(°C)	16.40
ORP (mv)	-218
TDS (g/L)	0.845

HACH TEST KITS	
Alkalinity (g/g)	300
Carbon Dioxide (mg/L)	108
Ferrous Iron (mg/L)	0
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	0.1
DTW (ft)	9.61

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

Plus dup

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-11B

Manual Entry:

Well Diameter: 4 inches

WATER VOLUME CALCULATION

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

Initial Depth to Water (ft): 9.05

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/14/2014

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	9.05	200	0	7.27	0.16	24.8	1.27	20.26	0.808	-264	Clear
11:10	9.30	200	0.5	7.11	0.0	12.5	1.29	17.22	0.828	-285	No
11:20	9.35	200	1.0	7.06	0.0	0.35	1.26	17.42	0.807	-286	Odor
11:30	9.35	200	1.5	7.04	0.0	0.67	1.25	17.37	0.800	-290	Ame
11:35	9.32	200	1.7	7.03	0.0	0.34	1.24	17.32	0.794	-293	
11:40	9.32	200	1.9	7.08	0.0	0.8	1.23	17.34	0.790	-297	Same
11:45	9.32	200	2.1	7.13	0.0	1.05	1.23	17.31	0.788	-300	
11:50	9.32	200	2.3	7.15	0.0	0.67	1.22	17.30	0.785	-300	Same

Method: Dedicated tubing

Date: 10/14/2014

Time: *(hhmm)* 11:50

Total Volume of Water Purged: 2.3 (gal)

STABILIZED PARAMETERS	
pH	7.15
Spec. Cond.(mS/cm)	1.22
Turbidity (NTU)	0.67
DO (mg/L)	0.0
Temp.(°C)	17.30
ORP (mv)	-300
TDS (g/L)	0.785

HACH TEST KITS	
Alkalinity (g/g)	320
Carbon Dioxide (mg/L)	102
Ferrous Iron (mg/L)	0
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	0.2
DTW (ft)	9.32

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-16A

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): 3.65

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/13/2014

Time: 0 *(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
10:50	3.65	200	0	7.04	0.83	37	2.89	14.89	1.84	10	Clear
11:00	9.58	100	0.5	6.91	0.0	22.6	2.85	14.79	1.83	37	No
11:10	10.90	100	0.7	6.93	0.0	29.4	2.86	14.87	1.83	-19	Odor
11:20	12.83	100	0.9	6.95	0.0	18.7	2.65	14.83	1.75	-4	Same
11:25	14.19	100	1.1	6.98	0.84	12.9	2.50	14.79	1.59	12	Same
11:30	15.05	100	12	7.01	1.38	14.6	2.36	14.77	1.51	40	
11:35	15.31	100	1.3	6.98	1.42	8.75	2.34	14.77	1.49	40	
11:40	15.50	100	1.4	6.97	1.46	4.46	2.29	14.78	1.47	39	
11:45	15.85	100	1.5	6.95	1.21	3.13	2.43	14.78	1.57	42	
11:50	16.10	100	1.7	6.93	0.82	2.42	2.59	14.79	1.66	47	
11:55	16.60	100	1.8	6.90	0.42	1.86	2.75	14.75	1.73	29	
12:00	17.05	100	1.9	6.86	0.18	1.26	2.81	14.72	1.80	15	
12:05	17.65	100	2.0	6.87	0.09	1.35	2.85	14.68	1.82	21	
12:10	18.15	100	2.2	6.89	0.0	1.86	2.89	14.63	1.85	26	
12:15	Dry		O	O	O	O	O	O		O	

Method: Dedicated tubing

Date: 10/14/2014

Time: 12:10 *(hhmm)*

Total Volume of Water Purged: (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)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	
DTW (ft)	

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

Ran dry during microbial sample

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: MW-16B

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): 4.68

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/13/2014

Time: 12:40 *(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
12:40	4.68	200	0	6.46	0.0	458	1.30	15.40	0.919	-260	Black
12:50	4.90	200	0.5	6.24	0.0	17.3	1.22	14.71	0.781	-259	Change tubing
13:00	5.03	200	1.0	6.28	0.0	15.4	1.20	15.10	0.767	-261	Clear
13:10	5.10	200	1.5	6.25	0.0	8.66	1.20	14.97	0.766	-260	Organic odor
13:15	5.14	200	1.7	6.14	0.0	8.12	1.20	14.99	0.766	-256	Same
13:20	5.17	200	1.9	6.08	0.0	7.50	1.19	15.01	0.766	-251	Black solids
13:25	5.20	200	2.1	6.28	0.0	3.74	1.24	14.88	0.765	-264	Same
13:30	5.21	200	2.3	6.27	0.0	4.68	1.27	14.75	0.809	-264	
13:35	5.23	200	2.5	6.27	0.0	11.3	1.28	14.87	0.856	-267	

Method: Dedicated tubing

Date: 10/13/2014

Time: *(hhmm)* 13:35

Total Volume of Water Purged: 2.5 (gal)

STABILIZED PARAMETERS	
pH	6.27
Spec. Cond.(mS/cm)	1.28
Turbidity (NTU)	11.3
DO (mg/L)	0.0
Temp.(°C)	14.87
ORP (mv)	-267
TDS (g/L)	0.856

HACH TEST KITS	
Alkalinity (g/g)	460
Carbon Dioxide (mg/L)	478
Ferrous Iron (mg/L)	1
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	1.5
DTW (ft)	5.23

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: MW-17B

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):	Depth to Well Bottom (ft):
4.42	

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

Purging Data

Method: Low flow

Date: 10/14/2014

Time: 1410 *(hhmm)*

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
1410	5.12	300	0.40	6.47	0	213	2.32	20.54	1.54	-80	WT @ 4.32 after pum...
1415	5.15	300	0.80	6.46	0	52.9	2.42	20.37	1.51	-82	
1425	5.81	300	1.20	6.41	0	42.7	2.46	19.81	1.59	-131	
1430	6.42	300	1.60	6.42	0	37.3	2.46	19.81	1.59	-131	
1435	6.46	200	1.87	6.40	0	31.7	2.48	19.70	1.59	-127	
1440	6.44	200	2.06	6.41	0	28.8	2.48	19.67	1.59	-142	
1445	6.43	200	2.33	6.42	0	19.4	2.48	19.62	1.59	-154	
1450	6.43	200	2.50	6.42	0	15.4	2.45	19.22	1.56	-160	
1455	6.43	200	2.77	6.40	0	9.17	2.48	19.23	1.58	-163	

Method: Dedicated tubing

Date: 10/14/2014

Time: *(hhmm)* 1455

Total Volume of Water Purged: 2.77 (gal)

STABILIZED PARAMETERS	
pH	6.4
Spec. Cond.(mS/cm)	2.48
Turbidity (NTU)	9.17
DO (mg/L)	0
Temp.(°C)	19.23
ORP (mv)	-163
TDS (g/L)	1.58

HACH TEST KITS	
Alkalinity (g/g)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	5
DTW (ft)	6.43

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

water too dark

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: MW-18B

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): 6.2

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/13/2014

Time: 1300 *(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
1300	7.02	300	0.4	6.09	0.0	-117	0.564	16.22	0.361	-109	
1305	7.29	300	0.8	6.04	0	1573	0.605	16.31	0.404	-113	
1315	7.52	300	1.6	6.05	0.00	73.3	0.691	16.48	0.442	-127	
1320	7.79	300	2.0	6.04	0.00	74.5	0.723	16.43	0.466	-126	
1330	7.83	200	2.27	6.06	0	66.8	0.775	16.51	0.472	-126	
1335	7.77	200	2.53	6.09	0	61.5	0.812	16.61	0.509	-127	
1340	7.75	200	2.80	6.12	0	54.4	0.830	16.67	0.533	-127	
1345	7.74	200	3.07	6.13	0	45.3	0.868	16.70	0.552	[-128	
1355	7.74	200	3.34	6.16	0	44.1	0.933	16.77	0.595	-127	
1400	7.73	200	3.61	6.16	0	46.8	0.969	16.93	0.620	-127	
1405	7.73	290	3.86	6.18	0	44.2	1.02	16.78	0.654	-130	
1410	7.73	200	4.03	6.19	0	51.5	1.05	16.91	0.672	-130	
1415	7.73	200	4.30	6.20	0	49.4	1.06	17.01	0.678	-130	
1420	7.73	200	4.57	6.18	0	48.6	1.06	17.14	0.682	-129	

Method: Dedicated tubing

Date: 10/13/2014

Time: *(hhmm)* 1420

Total Volume of Water Purged: 4.57 (gal)

STABILIZED PARAMETERS	
pH	6.18
Spec. Cond.(mS/cm)	1.06
Turbidity (NTU)	48.6
DO (mg/L)	0
Temp.(°C)	17.14
ORP (mv)	-129
TDS (g/L)	0.682

HACH TEST KITS	
Alkalinity (g/g)	440
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	3.2
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	4
DTW (ft)	7.73

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

water turned dark when shaken

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: PMW-1

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): 9.09

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/10/2014

Time: 13:10 *(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
13:10	9.09	200	0.0	7.25	2.32	875	0.963	21.91	0.645	-72	
13:20	12.65	200	0.5	6.85	0.0	673	1.00	17.03	0.642	-120	
13:30	12.75	150	0.9	6.81	0.0	53.6	1.02	16.70	0.652	-121	
13:40	13.00	150	1.3	6.79	0.0	65.5	1.06	15.82	0.681	-124	
13:45	13.02	150	1.5	6.77	0.0	62.3	1.09	15.65	0.694	-124	
13:50	13.05	150	1.7	6.77	0.0	58.8	1.11	15.38	0.711	-125	
13:55	13.10	150	1.9	6.74	0.0	61.7	1.16	15.26	0.746	-126	
14:00	13.12	150	2.1	6.69	0.0	54.1	1.21	14.82	0.806	-127	
14:05	13.12	150	2.3	6.68	0.0	45.6	1.25	14.78	0.821	-126	
14:10	13.11	150	2.5	6.68	0.0	40.6	1.27	14.74	0.844	-126	
14:15	13.12	150	2.7	6.69	0.0	39.2	1.29	14.72	0.855	-126	
14:20	13.13	150	2.9	6.70	0.0	37.4	1.30	14.71	0.862	-126	

Method: Dedicated tubing

Date: 10/10/2014

Time: *(hhmm)* 14:20

Total Volume of Water Purged: 2.9 (gal)

STABILIZED PARAMETERS	
pH	6.7
Spec. Cond.(mS/cm)	1.30
Turbidity (NTU)	37.4
DO (mg/L)	0.0
Temp.(°C)	14.71
ORP (mv)	-126
TDS (g/L)	0.862

HACH TEST KITS	
Alkalinity (g/g)	800
Carbon Dioxide (mg/L)	564
Ferrous Iron (mg/L)	2
Manganese (mg/L)	0.3
Hydrogen Sulfide (mg/L)	0.6
DTW (ft)	13.13

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

Dup collected

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: PMW-2

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): 7.82

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/10/2014

Time: 0850 *(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
0850	8.36	200	0.27	6.16	0.29	33.2	1.15	13.68	0.733	-43	
0855	10.81	100	0.40	6.30	0.00	25.6	1.17	13.82	0.749	-65	
0900	11.15	100	0.53	6.32	0.00	16.8	1.20	13.73	0.767	-72	
0910	11.22	100	0.89	6.31	0.00	25.4	1.22	13.78	0.780	-79	
0915	11.21	100	1.96	6.31	0.00	36.2	1.23	13.77	0.786	-82	
0925	11.21	100	2.03	6.31	0.00	23.4	1.28	13.79	0.819	-86	
0935	11.17	100	2.20	6.30	0.00	18.5	1.40	13.92	0.895	-89	
0945	11.18	100	2.33	6.30	0.00	17.4	1.41	14.00	0.901	-91	
0945	11.18	100	2.46	6.30	0.00	19.4	1.42	14.03	0.909	-93	
0950	11.21	100	2.60	6.33	0.00	22.5	1.44	14.10	0.932	-95	
0955	11.25	100	2.73	6.35	0.00	21.7	1.48	14.11	0.955	-95	
1000	11.29	100	2.86	6.37	0.00	20.5	1.50	14.15	0.960	-97	
1005	11.33	100	3.00	6.32	0.00	21.2	1.50	14.32	0.961	-99	
1010	11.32	100	3.13	6.32	0.00	20.9	1.50	14.52	0.963	-100	
1015	11.33	100	3.30	6.33	0.00	17.9	1.52	14.65	0.975	-103	

Method: Dedicated tubing

Date: 10/10/2014

Time: 1015 *(hhmm)*

Total Volume of Water Purged: 3.3 (gal)

STABILIZED PARAMETERS	
pH	6.33
Spec. Cond.(mS/cm)	1.52
Turbidity (NTU)	17.9
DO (mg/L)	0.00
Temp.(°C)	14.65
ORP (mv)	-103
TDS (g/L)	0.975

HACH TEST KITS	
Alkalinity (g/g)	440
Carbon Dioxide (mg/L)	680
Ferrous Iron (mg/L)	2.8
Manganese (mg/L)	
Hydrogen Sulfide (mg/L)	0.9
DTW (ft)	11.33

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: PMW-3

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): 7.72

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/13/2014

Time: 08:45 *(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
08:45	7.73	200	0	6.29	0.28	47	1.07	13.85	0.683	-97	Clear
08:55	10.50	200	0.5	6.53	0.0	27.9	1.12	13.93	0.715	-213	Substrate
09:05	11.60	120	1.0	6.50	0.0	40.1	1.17	13.83	0.748	-227	Odor
09:15	11.43	120	1.3	6.49	0.0	33.9	1.20	13.90	0.768	-226	Same
09:20	11.50	120	1.4	6.49	0.0	42.3	1.22	13.87	0.785	-226	Ame
09:25	11.57	120	1.5	6.48	0.0	47.4	1.24	13.83	0.793	-227	Ame
09:30	11.60	120	1.7	6.48	0.0	44.5	1.24	13.83	0.795	-228	Same
09:35	11.65	120	1.8	6.50	0.0	45.0	1.25	13.88	0.804	-229	Same

Method: Dedicated tubing

Date: 10/13/2014

Time: *(hhmm)* 09:35

Total Volume of Water Purged: 1.8 (gal)

STABILIZED PARAMETERS	
pH	6.5
Spec. Cond.(mS/cm)	1.25
Turbidity (NTU)	45
DO (mg/L)	0.0
Temp.(°C)	13.88
ORP (mv)	-229
TDS (g/L)	0.804

HACH TEST KITS	
Alkalinity (g/g)	720
Carbon Dioxide (mg/L)	536
Ferrous Iron (mg/L)	2.3
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	3.5
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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: PMW-4

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): 9.18

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/10/2014

Time: 1130 *(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
1130	9.46	200	0.27	6.96	0.39	22.4	0.978	14.80	0.626	-66	
1135	9.38	100	0.40	6.87	0.00	12.8	0.975	14.56	0.624	-69	
1145	9.40	100	0.53	6.77	0.00	4.2	0.964	14.28	0.617	-90	
1155	9.40	100	0.66	6.72	0.00	2.5	0.968	14.37	0.620	-130	
1210	9.42	100	1.06	6.79	0.00	2.8	0.974	14.51	0.624	-175	
1215	9.42	100	1.29	6.79	0.0	3.4	0.978	14.50	0.626	-189	
1220	9.43	100	1.42	6.86	0.0	3.7	0.982	14.52	0.626	-208	
1225	9.43	100	1.55	6.93	0.0	4.3	0.989	14.51	0.633	-229	
1230	9.43	100	1.70	6.93	0.0	2.6	1.00	14.54	0.638	-238	
1235	9.45	100	1.83	6.96	0.0	3.2	1.00	14.54	0.643	-252	
1240	9.45	100	1.96	6.96	0.0	2.7	1.00	14.56	0.646	-262	
1245	9.46	100	2.06	6.97	0.0	2.2	1.01	14.58	0.648	-275	
1250	9.47	100	2.20	6.98	0.0	2.4	1.02	14.57	0.650	-287	
1255	9.47	100	2.33	6.97	0	2.2	1.02	14.60	0.651	-294	
1300	9.47	100	2.46	6.97	0	2.2	1.02	14.60	0.651	-299	
1305	9.47	100	2.70	6.88	0	2.5	1.02	14.49	0.652	-296	

Method: Dedicated tubing

Date: 10/10/2014

Time: *(hhmm)* 1305

Total Volume of Water Purged: 2.7 (gal)

STABILIZED PARAMETERS	
pH	6.88
Spec. Cond.(mS/cm)	1.02
Turbidity (NTU)	2.5
DO (mg/L)	0
Temp.(°C)	14.49
ORP (mv)	-296
TDS (g/L)	0.652

HACH TEST KITS	
Alkalinity (g/g)	340
Carbon Dioxide (mg/L)	330
Ferrous Iron (mg/L)	0
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	3.5
DTW (ft)	9.47

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☐			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: PMW-5

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): 5.56

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/13/2014

Time: 0905 *(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
0905	5.58	250	0	6.25	0	45.2	2.42	15.03	1.54	44	
0910	5.82	250	0.30	6.25	0	36.9	2.38	15.43	1.53	19	
0915	5.96	250	0.60	6.15	0	43.2	2.39	15.37	1.53	-2	
0925	6.03	250	0.90	6.29	0	31.8	2.44	15.23	1.57	-38	
0930	6.05	250	1.20	6.30	0	24.6	2.45	15.27	1.57	-50	
0935	6.07	250	1.50...	6.30	0	27.9	2.47	15.27	1.58	-88	
0945	6.10	250	2.10	6.34	0	22.8	2.48	15.29	1.58	-121	
0950	6.13	200	2.37	6.34	0	24.3	2.48	15.22	1.59	-139	
0955	6.15	200	2.64	6.35	0	18.7	2.50	15.10	1.60	-168	
1000	6.17	200	2.91	6.35	0	15.6	2.50	15.2	1.60	-203	
1005	6.17	200	3.18	6.36	0	16.3	2.50	15.11	1.60	-246	
1010	6.17	200	3.35	6.36	0	17.6	2.49	15.16	1.60	-269	
1016	6.16	200	3.62	6.37	0	15.2	2.47	15.22	1.58	-325	
1025	6.16	200	3.89	6.37	0	14.6	2.46	15.33	1.58	-335	
1030	6.16	200	4.14	6.39	0	12.9	2.43	15.14	1.55	-348	
1040	6.16	200	4.35	6.37	0	13.5	2.40	15.10	1.54	-354	
1045	6.16	200	4.52	6.39	0	16.8	2.39	15.10	1.53	-358	
1050	6.16	200	4.79	6.39	0	15.3	2.39	15.12	1.54	-357	
1055	6.16	200	5.03	6.39	0	14.6	2.40	15.14	1.54	-359	

Method: Dedicated tubing

Date: 10/13/2014

Time: *(hhmm)* 1055

Total Volume of Water Purged: 5.03 (gal)

STABILIZED PARAMETERS	
pH	6.39
Spec. Cond.(mS/cm)	2.40
Turbidity (NTU)	14.6
DO (mg/L)	0
Temp.(°C)	15.14
ORP (mv)	-359
TDS (g/L)	1.54

HACH TEST KITS	
Alkalinity (g/g)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	4
DTW (ft)	6.16

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

Water turned black

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: PMW-7

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): 5.96

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/15/2014 Time: 1210 *(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
1210	6.05	300	0.4	6.80	0.55	293	1.82	20.09	1.16	-230	Water level rose quick...
1215	6.16	300	0.8	6.74	0	86.4	1.85	20.01	1.85	-229	
1220	6.18	300	1.2	6.77	0	72.8	1.92	18.92	1.23	-233	
1225	6.23	300	1.6	6.78	0	55.3	1.97	18.84	1.26	-234	
1230	6.25	300	2.0	6.77	0	46.3	2.03	18.34	1.29	-233	
1235	6.26	300	2.4	6.77	0	13.8	2.03	18.27	1.29	-232	
1240	6.27	300	2.6	6.77	0	14.8	2.02	18.20	1.29	-230	
1245	6.26	300	3.0	6.78	0	9.76	2.05	18.34	1.31	-229	

Method: Dedicated tubing

Date: 10/15/2014 Time: *(hhmm)* 1245

Total Volume of Water Purged: 3 (gal)

STABILIZED PARAMETERS	
pH	6.78
Spec. Cond.(mS/cm)	2.05
Turbidity (NTU)	9.76
DO (mg/L)	0
Temp.(°C)	18.34
ORP (mv)	-229
TDS (g/L)	1.31

HACH TEST KITS	
Alkalinity (g/g)	440
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	0
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	4
DTW (ft)	6.26

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☑			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

water turned dark during co2 titration

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Doruk Ucak

Well ID: PMW-8

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): 5.92

Depth to Well Bottom (ft):

Purging Data

Method: Low flow

Date: 10/10/2014

Time: 1410 *(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
1410	5.92	150	0.2p,...	9.08	0.75	6.82	0.699	16.77	0.447	-311	
1415	5.92	150	0.4	7.46	0.00	4.33	0.923	16.18	0.596	-303	
1430	5.92	150	1.6	6.86	0.0	2.91	1.10	15.89	0.706	-316	
1440	5.92	150	2.0	6.79	0.0	4.32	1.12	15.88	0.717	-319	
1445	5.92	150	2.2	6.83	0	3.85	1.12	15.83	0.720	-312	
1450	5.92	150	2.4	6.88	0	3.72	1.13	15.84	0.725	-326	
1455	5.93	150	2.6	6.90	0	3.94	1.14	15.90	0.731	-331	
1500	5.93	150	2.8	6.95	0	2.14	1.15	15.85	0.734	-331	

Method: Dedicated tubing

Date: 10/10/2014

Time: *(hhmm)* 1500

Total Volume of Water Purged: 2.8 (gal)

STABILIZED PARAMETERS	
pH	6.95
Spec. Cond.(mS/cm)	1.15
Turbidity (NTU)	2.14
DO (mg/L)	0
Temp.(°C)	15.85
ORP (mv)	-331
TDS (g/L)	0.734

HACH TEST KITS	
Alkalinity (g/g)	320
Carbon Dioxide (mg/L)	220
Ferrous Iron (mg/L)	2.8
Manganese (mg/L)	0.1
Hydrogen Sulfide (mg/L)	0.9
DTW (ft)	5.93

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☐			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

PARSONS

LOW FLOW WELL SAMPLING RECORD

Site Name: Hyde Park

Samplers: Dan Chamberland

Well ID: PMW-9

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):	Depth to Well Bottom (ft):
5.3	

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

Purging Data

Method: Low flow

Date: 10/13/2014

Time: 14:30 *(hhmm)*

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
14:30	5.30	200	0.0	7.19	1.45	140	1.82	15.71	1.17	-99	Clear
14:40	5.30	200	0.5	7.18	1.57	4.83	1.84	15.23	1.17	-105	Ight
14:50	5.32	200	1.0	7.15	1.54	4.63	1.81	14.91	1.16	-104	Odor
15:00	5.33	200	1.5	7.19	1.86	2.83	1.82	15.27	1.16	-108	Same
15:05	5.33	200	1.7	7.20	1.86	1.12	1.80	15.11	1.15	-115	
15:10	5.33	200	1.9	7.20	1.86	1.78	1.79	14.98	1.15	-121	Same
15:15	5.33	200	2.2	7.20	1.90	2.14	1.79	14.89	1.15	-133	
15:20	5.33	200	2.4	7.22	1.92	1.89	1.78	14.84	1.14	-143	
15:25	5.33	200	2.6	7.22	1.95	4.50	1.77	14.93	1.13	-145	
15:30	5.33	200	2.9	7.22	1.97	2.68	1.77	14.99	1.13	-148	

Method: Dedicated tubing

Date: 10/13/2014

Time: *(hhmm)* 15:30

Total Volume of Water Purged: 2.9 (gal)

STABILIZED PARAMETERS	
pH	7.22
Spec. Cond.(mS/cm)	1.77
Turbidity (NTU)	2.68
DO (mg/L)	err
Temp.(°C)	14.99
ORP (mv)	-148
TDS (g/L)	1.13

HACH TEST KITS	
Alkalinity (g/g)	320
Carbon Dioxide (mg/L)	212
Ferrous Iron (mg/L)	0.8
Manganese (mg/L)	0
Hydrogen Sulfide (mg/L)	0.5
DTW (ft)	5.33

* 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
MEEP	☑	2-40mL glass vial	HCl	Lab SOP
Bromide	☑			300.1
Chloride/Sulfate	☑	2-40mL glass vial	HCl	300.1
TOC	☑	2-40mL amber glass vial	H3PO4	5310C
DOC	☑			5310C
BOD	☐			5120B
COD	☐			410.4
Dissolved Iron	☐			6010B
Nitrate/Nitrite	☐			353.2/354.1
Sulfide	☑	1-250 mL glass (field filtered)	NaOH/Zn Acetate	MS-45000-S2-F

Comments:

DO and ORP values conflict. DO > 0.5 and ORP < 0. Plus ms msd

PARSONS

APPENDIX B

DATA VALIDATION REPORT

OCTOBER 2014 12-MONTH PERFORMANCE MONITORING

DATA USABILITY SUMMARY REPORT

HYDE PARK FACILITY

Prepared For:

Atlantic Richfield Company

4850 East 49th Street
MBC 3-147
Cuyahoga Heights, Ohio 44125

Prepared By:

PARSONS

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Buffalo, New York 14202
(716) 541-0730

NOVEMER 2014

TABLE OF CONTENTS

LIST OF ATTACHMENTS

SECTION 1

DATA USABILITY SUMMARY

Groundwater samples were collected from the Hyde Park site in Niagara Falls, New York from October 9, 2014 through October 14, 2014 as part of the 12-month performance monitoring sampling event. Analytical results from these samples were reviewed by Parsons for usability with respect to the following requirements:

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

The analytical laboratories for this project were Eurofins Laboratory (Eurofins) and Microbial Insights (MI). 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 23-26 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, shipped under a COC record, and received at the laboratory within one day of sampling. All samples were received intact and in good condition at Eurofins. It was noted that methane sample MW-4A was received and analyzed at Eurofins with a pH at 7 which exceeds the pH<2 preservation requirement.

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; chloride; bromide; sulfate; sulfide; total organic carbon (TOC); dissolved organic carbon (DOC); and/or dechlorinating bacteria. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.3. The data qualifications resulting from the data review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, and comparability (PARCC) are discussed for each analytical method in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

"U" - not detected at the value given,

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

"J" - estimated at the value given,

"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 Hyde Park 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 instrument calibrations and sample preservation. The reported VOC and MEEP analytical results were 100% complete (i.e., usable) for the groundwater data presented by Eurofins. PARCC requirements were met.

1.3.2 Metals Analysis

The groundwater samples collected from the Hyde Park 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. PARCC requirements were met.

1.3.3 Other Parameters

The groundwater samples collected from the Hyde Park site were analyzed for chloride, bromide, and sulfate using the USEPA 300.0 analytical method; sulfide using the SM20 4500-S2 analytical method; TOC and DOC using the SM20 5310C analytical method; and dechlorinating bacteria using the MI SOP. 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. The reported analytical results for the wet chemistry parameters were 100% complete (i.e., usable) for the groundwater data presented by Eurofins and MI. PARCC 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 Hyde Park 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) BPX22, BPX23, BPX24, and BPX25. 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 holding times and continuing calibrations as discussed below.

Holding Times

All analytical holding times were within the 14-day criteria for preserved volatile samples with the exception of the methane sample MW-4A. This sample was received by the laboratory at a pH of 7 and exceeded the 7-day analytical holding time criteria for unpreserved samples by

one day. Therefore, the positive methane result for this sample was considered estimated and qualified "J".

Continuing Calibrations

All continuing calibration compounds were compliant with a minimum relative response factor (RRF) of 0.05 and a maximum percent difference (%D) within ±20% with the exception of 1,1,1-trichloroethane (-23%D) in the continuing calibration associated with samples collected on 10/14/14. Therefore, the sample results for this compound which were nondetects were considered estimated and qualified "UJ" for the affected samples.

Usability

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

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, and comparability. The volatile groundwater data presented 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 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, and comparability. 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 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-1 INJ-1_2014-10-09 7632826/035LJ-3 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 14:30 11/23/2014	INJ-2 INJ-2_2014-10-10 7634045 LANCASTERLABS BPX23 WATER 10/10/2014 9:50 11/23/2014	INJ-5L INJ-5L_2014-10-09 7632824/035LJ-2 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 14:00 11/23/2014	INJ-5U INJ-5U_2014-10-09 7632825/035LJ-1 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 11:20 11/23/2014	MW-4A MW-4A_2014-10-14 7638075/035LJ-9 LANCASTERLABS/MI BPX25/035LJ WATER 10/14/2014 16:40 11/23/2014	MW-7A MW-7A_2014-10-09 7632827/035LJ-4 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 16:20 11/23/2014
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 UJ	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	1.9	3.5	1.8	30	1.1	8.1
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.94 J	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	3.1	11	4	84	9.1	11
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	2.9	0.77 J	1.3	4.3	5.3	0.92 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	1.3	1.2	1.1	1.2	2.2	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	1.3	0.57 J	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	15	1.6	3.4	2.4	5.8	0.94 J
74-85-1	ETHENE	ug/l	120	10	16	210	56	1 U
74-84-0	ETHANE	ug/l	19	13	8.1	14	3.5 J	4.7 J
74-82-8	METHANE	ug/l	19000	15000	15000	17000	19000 J	16000
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U	1 U	1 U
	DISSOLVED METALS							
7439-89-6	IRON	mg/l	5.05	3.8	5.57	25.6	57.6	14.1
	WET CHEM							
24959-67-9	BROMIDE	mg/l	1.6 J	1.3 U	2.4 J	6.2	8.3	2.2 J
16887-00-6	CHLORIDE (AS CL)	mg/l	24.7	19.2	28.9	41.4	83.8	27.9
14808-79-8	SULFATE (AS SO4)	mg/l	2.5 J	3.8 J	1.5 U	1.5 U	2.5 J	4 J
18496-25-8	SULFIDE	mg/l	2.8	1.4	1.5	0.054 U	0.054 U	0.11 J
TOC	TOTAL ORGANIC CARBON	mg/l	54.3	73.3	107	72.1	159	132
DOC	DISSOLVED ORGANIC CARBON	mg/l	63.7	89.4	125	80.2	161	155
	DECHLORINATING BACTERIA							
DHBt	DHBt	cells/mL	75.3		4.2 J	146	4340	128
DHC	DHC	cells/mL	7180		3940	98000	85400	19000
VCR	VCR	cells/mL	74.4		19	8810	1900	570
BVC	BVC	cells/mL	180		241	1710	4.2 U	613
TCE	TCE	cells/mL	110		90.5	1320	2920	412

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-7B MW-7B_2014-10-10 7634042 LANCASTERLABS BPX23 WATER 10/10/2014 12:20 11/23/2014	MW-10B MW-10B_2014-10-14 7638070 LANCASTERLABS BPX25 WATER 10/14/2014 10:00 11/23/2014	Dup of MW-10B_2014-10-14 MW-10B MW-100B_2014-10-14 7638073 LANCASTERLABS BPX25 WATER 10/14/2014 12:01 11/23/14	MW-11B MW-11B_2014-10-14 7638071 LANCASTERLABS BPX25 WATER 10/14/2014 11:50 11/23/2014	MW-16A MW-16A_2014-10-14 7638072/035LJ-8 LANCASTERLABS/MI BPX25/035LJ WATER 10/14/2014 12:10 11/23/2014	MW-16B MW-16B_2014-10-13 7636319/035LJ-7 LANCASTERLABS/MI BPX24/035LJ WATER 10/13/2014 13:35 11/23/2014
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 U	1.2	0.5 U	2.9
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	1.5	160	160	0.5 U	8.6	17
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	0.66 J	0.5 U	8.8
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	8	89	89	2.5	350	22
74-85-1	ETHENE	ug/l	7	210	210	86	52	610
74-84-0	ETHANE	ug/l	2.3 U	1.1 J	1.1 J	1.4 J	1 U	13
74-82-8	METHANE	ug/l	13000	1100	1000	4200	9.5	21000
74-98-6	PROPANE	ug/l	1 U	1.9 J	1.8 J	1 U	1 U	1 U
	DISSOLVED METALS							
7439-89-6	IRON	mg/l	0.0334 U	0.05 J	0.0484 J	0.0334 U	0.491	0.372 J
	WET CHEM							
24959-67-9	BROMIDE	mg/l	1.3 U	1.3 U	1.3 U	1.3 U	2 J	1.3 U
16887-00-6	CHLORIDE (AS CL)	mg/l	164	137	130	143	221	43.3
14808-79-8	SULFATE (AS SO4)	mg/l	129	215	224	160	958	21.6
18496-25-8	SULFIDE	mg/l	22.6	1.3	1.3	11.1	0.054 U	17.2
TOC	TOTAL ORGANIC CARBON	mg/l	22.2	5	4.9	5.3	9.1	211
DOC	DISSOLVED ORGANIC CARBON	mg/l	22.4	4.5	4.3	4.7	8	244
	DECHLORINATING BACTERIA							
DHBt	DHBt	cells/mL					97.7	74.8
DHC	DHC	cells/mL					376	3160
VCR	VCR	cells/mL					4.8	58.5
BVC	BVC	cells/mL					9.2	0.7 U
TCE	TCE	cells/mL					0.3 J	212

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-17B MW-17B_2014-10-14 7638068 LANCASTERLABS BPX25 WATER 10/14/2014 14:55 11/23/2014	MW-18B MW-18B_2014-10-13 7636320 LANCASTERLABS BPX24 WATER 10/13/2014 14:20 11/23/2014	PMW-1 PMW-1_2014-10-10 7634046 LANCASTERLABS BPX23 WATER 10/10/2014 14:20 11/23/2014	Dup of PMW-1_2014-10-10 PMW-1 PMW-1_2014-10-10FD 7634050 LANCASTERLABS BPX23 WATER 10/10/2014 12:01 11/23/2014	PMW-2 PMW-2_2014-10-10 7634044 LANCASTERLABS BPX23 WATER 10/10/2014 10:15 11/23/2014	PMW-3 PMW-3_2014-10-13 7636314/035LJ-5 LANCASTERLABS/MI BPX24/035LJ WATER 10/13/2014 9:35 11/23/2014
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	3.3	0.5 U	6.6	6.8	7.5	4.9
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	8.2	0.5 U	17	18	33	2.6
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.52 J	1.1	1.5	1.5	27	110
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	0.71 J	0.5 U	0.6 J	0.57 J	1 J	0.94 J
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	2.5	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	1.1	4.6	2.3	2.2	7.9	51
74-85-1	ETHENE	ug/l	17	11	10	8.8	82	110
74-84-0	ETHANE	ug/l	8.3	4 J	17	15	41	19
74-82-8	METHANE	ug/l	16000	18000	16000	16000	18000	20000
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U	1 U	1 U
	DISSOLVED METALS							
7439-89-6	IRON	mg/l	15.5	8.37	4.1	4.36	12.6	2.83
	WET CHEM							
24959-67-9	BROMIDE	mg/l	1.3 U	1.3 U	1.3 U	1.3 U	1.5 J	1.3 U
16887-00-6	CHLORIDE (AS CL)	mg/l	386	34.9	12.9	13.1	43.3	27.5
14808-79-8	SULFATE (AS SO4)	mg/l	1.5 U	3.8 J	10.7	10	1.5 U	9.9
18496-25-8	SULFIDE	mg/l	4.1	2.8	1.2	1.3	0.45	2.4
TOC	TOTAL ORGANIC CARBON	mg/l	38.4	166	40.9	46.4	89.3	29.2
DOC	DISSOLVED ORGANIC CARBON	mg/l	37	194	45.1	57.2	105	34.3
	DECHLORINATING BACTERIA							
DHBt	DHBt	cells/mL						498
DHC	DHC	cells/mL						356000
VCR	VCR	cells/mL						17800
BVC	BVC	cells/mL						47000
TCE	TCE	cells/mL						448

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-4 PMW-4_2014-10-10 7634043 LANCASTERLABS BPX23 WATER 10/10/2014 13:05 11/23/2014	PMW-5 PMW-5_2014-10-13 7636315/035LJ-6 LANCASTERLABS/MI BPX24/035LJ WATER 10/13/2014 10:55 11/23/2014	PMW-7 PMW-7_2014-10-14 7638069 LANCASTERLABS BPX25 WATER 10/14/2014 12:45 11/23/2014	PMW-8 PMW-8_2014-10-10 7634047 LANCASTERLABS BPX23 WATER 10/10/2014 15:00 11/23/2014	PMW-9 PMW-9_2014-10-13 7636316 LANCASTERLABS BPX24 WATER 10/13/2014 15:30 11/23/2014	FIELDQC TB1_2014-09-29A 7632828 LANCASTERLABS BPX22 WATER 9/29/2014 0:00 11/23/14
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	2	14	0.5 U	9.8	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	6.3	2.6	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.87 J	2.4	34	0.58 J	31	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	2.7	1.1	0.5 U	0.9 J	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.72 J	2.9	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	1.4	3.8	13	1.3	48	0.5 U
74-85-1	ETHENE	ug/l	11	92	37	46	96	
74-84-0	ETHANE	ug/l	3.4 J	6.2	30	1.4 J	9.4	
74-82-8	METHANE	ug/l	13000	18000	20000	5400	12000	
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U	1 U	
	DISSOLVED METALS							
7439-89-6	IRON	mg/l		8.76	0.612			
	WET CHEM							
24959-67-9	BROMIDE	mg/l	1.3 U	2.4 J	1.3 U	1.3 U	1.3 U	
16887-00-6	CHLORIDE (AS CL)	mg/l	72.9	197	279	113	302	
14808-79-8	SULFATE (AS SO4)	mg/l	140	23.4	43.2	146	117	
18496-25-8	SULFIDE	mg/l	5.8	16.8	15.7	16.2	1.1	
TOC	TOTAL ORGANIC CARBON	mg/l	3.2	128	31.4	3.6	3.2	
DOC	DISSOLVED ORGANIC CARBON	mg/l	3.8	139	34.3	4.7	3.6	
	DECHLORINATING BACTERIA							
DHBt	DHBt	cells/mL		148				
DHC	DHC	cells/mL		15500				
VCR	VCR	cells/mL		188				
BVC	BVC	cells/mL		157				
TCE	TCE	cells/mL		288				

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	FIELDQC TB1_2014-09-29B 7636321 LANCASTERLABS BPX24 WATER 10/13/2014 0:00 11/23/14	FIELDQC TB1_2014-09-29C 7638074 LANCASTERLABS BPX25 WATER 9/29/2014 0:00 11/23/14	FIELDQC TB1_2014-10-10 7634051 LANCASTERLABS BPX23 WATER 10/10/2014 0:00 11/23/14
CAS NO.	COMPOUND	UNITS:			
	VOLATILES				
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 UJ	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	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
75-00-3	CHLOROETHANE	ug/l	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
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	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
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	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
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				
24959-67-9	BROMIDE	mg/l			
16887-00-6	CHLORIDE (AS CL)	mg/l			
14808-79-8	SULFATE (AS SO4)	mg/l			
18496-25-8	SULFIDE	mg/l			
TOC	TOTAL ORGANIC CARBON	mg/l			
DOC	DISSOLVED ORGANIC CARBON	mg/l			
	DECHLORINATING BACTERIA				
DHBt	DHBt	cells/mL			
DHC	DHC	cells/mL			
VCR	VCR	cells/mL			
BVC	BVC	cells/mL			
TCE	TCE	cells/mL			

APPENDIX C

ANALYTICAL SUMMARY TABLES

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Analytical Summary Table- 12-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-1 INJ-1_2014-10-09 7632826/035LJ-3 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 14:30 11/23/2014	INJ-2 INJ-2_2014-10-10 7634045 LANCASTERLABS BPX23 WATER 10/10/2014 9:50 11/23/2014	INJ-5L INJ-5L_2014-10-09 7632824/035LJ-2 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 14:00 11/23/2014	INJ-5U INJ-5U_2014-10-09 7632825/035LJ-1 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 11:20 11/23/2014
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
75-34-3	1,1-DICHLOROETHANE	ug/l	1.9	3.5	1.8	30
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.94 J
75-00-3	CHLOROETHANE	ug/l	3.1	11	4	84
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	2.9	0.77 J	1.3	4.3
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	1.3	1.2	1.1	1.2
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	1.3
75-01-4	VINYL CHLORIDE	ug/l	15	1.6	3.4	2.4
74-85-1	ETHENE	ug/l	120	10	16	210
74-84-0	ETHANE	ug/l	19	13	8.1	14
74-82-8	METHANE	ug/l	19000	15000	15000	17000
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	5.05	3.8	5.57	25.6
	WET CHEM					
24959-67-9	BROMIDE	mg/l	1.6 J	1.3 U	2.4 J	6.2
16887-00-6	CHLORIDE (AS CL)	mg/l	24.7	19.2	28.9	41.4
14808-79-8	SULFATE (AS SO4)	mg/l	2.5 J	3.8 J	1.5 U	1.5 U
18496-25-8	SULFIDE	mg/l	2.8	1.4	1.5	0.054 U
TOC	TOTAL ORGANIC CARBON	mg/l	54.3	73.3	107	72.1
DOC	DISSOLVED ORGANIC CARBON	mg/l	63.7	89.4	125	80.2
	DECHLORINATING BACTERIA					
DHBt	DHBt	cells/mL	75.3		4.2 J	146
DHC	DHC	cells/mL	7180		3940	98000
VCR	VCR	cells/mL	74.4		19	8810
BVC	BVC	cells/mL	180		241	1710
TCE	TCE	cells/mL	110		90.5	1320

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Analytical Summary Table- 12-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-4A MW-4A_2014-10-14 7638075/035LJ-9 LANCASTERLABS/MI BPX25/035LJ WATER 10/14/2014 16:40 11/23/2014	MW-7A MW-7A_2014-10-09 7632827/035LJ-4 LANCASTERLABS/MI BPX22/035LJ WATER 10/9/2014 16:20 11/23/2014	MW-7B MW-7B_2014-10-10 7634042 LANCASTERLABS BPX23 WATER 10/10/2014 12:20 11/23/2014	MW-10B MW-10B_2014-10-14 7638070 LANCASTERLABS BPX25 WATER 10/14/2014 10:00 11/23/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 UJ	0.5 U	0.5 U	0.5 UJ
75-34-3	1,1-DICHLOROETHANE	ug/l	1.1	8.1	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
75-00-3	CHLOROETHANE	ug/l	9.1	11	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	5.3	0.92 J	1.5	160
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	2.2	0.5 U	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.57 J	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	5.8	0.94 J	8	89
74-85-1	ETHENE	ug/l	56	1 U	7	210
74-84-0	ETHANE	ug/l	3.5 J	4.7 J	2.3 U	1.1 J
74-82-8	METHANE	ug/l	19000 J	16000	13000	1100
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1.9 J
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	57.6	14.1	0.0334 U	0.05 J
	WET CHEM					
24959-67-9	BROMIDE	mg/l	8.3	2.2 J	1.3 U	1.3 U
16887-00-6	CHLORIDE (AS CL)	mg/l	83.8	27.9	164	137
14808-79-8	SULFATE (AS SO4)	mg/l	2.5 J	4 J	129	215
18496-25-8	SULFIDE	mg/l	0.054 U	0.11 J	22.6	1.3
TOC	TOTAL ORGANIC CARBON	mg/l	159	132	22.2	5
DOC	DISSOLVED ORGANIC CARBON	mg/l	161	155	22.4	4.5
	DECHLORINATING BACTERIA					
DHBt	DHBt	cells/mL	4340	128		
DHC	DHC	cells/mL	85400	19000		
VCR	VCR	cells/mL	1900	570		
BVC	BVC	cells/mL	4.2 U	613		
TCE	TCE	cells/mL	2920	412		

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Analytical Summary Table- 12-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	Dup of MW-10B_2014-10-14 MW-10B MW-100B_2014-10-14 7638073 LANCASTERLABS BPX25 WATER 10/14/2014 12:01 11/23/14	MW-11B MW-11B_2014-10-14 7638071 LANCASTERLABS BPX25 WATER 10/14/2014 11:50 11/23/2014	MW-16A MW-16A_2014-10-14 7638072/035LJ-8 LANCASTERLABS/MI BPX25/035LJ WATER 10/14/2014 12:10 11/23/2014	MW-16B MW-16B_2014-10-13 7636319/035LJ-7 LANCASTERLABS/MI BPX24/035LJ WATER 10/13/2014 13:35 11/23/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	1.2	0.5 U	2.9
75-35-4	1,1-DICHLOROETHENE	ug/l	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
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	160	0.5 U	8.6	17
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	0.66 J	0.5 U	8.8
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	89	2.5	350	22
74-85-1	ETHENE	ug/l	210	86	52	610
74-84-0	ETHANE	ug/l	1.1 J	1.4 J	1 U	13
74-82-8	METHANE	ug/l	1000	4200	9.5	21000
74-98-6	PROPANE	ug/l	1.8 J	1 U	1 U	1 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	0.0484 J	0.0334 U	0.491	0.372 J
	WET CHEM					
24959-67-9	BROMIDE	mg/l	1.3 U	1.3 U	2 J	1.3 U
16887-00-6	CHLORIDE (AS CL)	mg/l	130	143	221	43.3
14808-79-8	SULFATE (AS SO4)	mg/l	224	160	958	21.6
18496-25-8	SULFIDE	mg/l	1.3	11.1	0.054 U	17.2
TOC	TOTAL ORGANIC CARBON	mg/l	4.9	5.3	9.1	211
DOC	DISSOLVED ORGANIC CARBON	mg/l	4.3	4.7	8	244
	DECHLORINATING BACTERIA					
DHBt	DHBt	cells/mL			97.7	74.8
DHC	DHC	cells/mL			376	3160
VCR	VCR	cells/mL			4.8	58.5
BVC	BVC	cells/mL			9.2	0.7 U
TCE	TCE	cells/mL			0.3 J	212

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Analytical Summary Table- 12-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-17B MW-17B_2014-10-14 7638068 LANCASTERLABS BPX25 WATER 10/14/2014 14:55 11/23/2014	MW-18B MW-18B_2014-10-13 7636320 LANCASTERLABS BPX24 WATER 10/13/2014 14:20 11/23/2014	PMW-1 PMW-1_2014-10-10 7634046 LANCASTERLABS BPX23 WATER 10/10/2014 14:20 11/23/2014	Dup of PMW-1_2014-10-10 PMW-1 PMW-1_2014-10-10FD 7634050 LANCASTERLABS BPX23 WATER 10/10/2014 12:01 11/23/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 UJ	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	3.3	0.5 U	6.6	6.8
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	8.2	0.5 U	17	18
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.52 J	1.1	1.5	1.5
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.71 J	0.5 U	0.6 J	0.57 J
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	1.1	4.6	2.3	2.2
74-85-1	ETHENE	ug/l	17	11	10	8.8
74-84-0	ETHANE	ug/l	8.3	4 J	17	15
74-82-8	METHANE	ug/l	16000	18000	16000	16000
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	15.5	8.37	4.1	4.36
	WET CHEM					
24959-67-9	BROMIDE	mg/l	1.3 U	1.3 U	1.3 U	1.3 U
16887-00-6	CHLORIDE (AS CL)	mg/l	386	34.9	12.9	13.1
14808-79-8	SULFATE (AS SO4)	mg/l	1.5 U	3.8 J	10.7	10
18496-25-8	SULFIDE	mg/l	4.1	2.8	1.2	1.3
TOC	TOTAL ORGANIC CARBON	mg/l	38.4	166	40.9	46.4
DOC	DISSOLVED ORGANIC CARBON	mg/l	37	194	45.1	57.2
	DECHLORINATING BACTERIA					
DHBt	DHBt	cells/mL				
DHC	DHC	cells/mL				
VCR	VCR	cells/mL				
BVC	BVC	cells/mL				
TCE	TCE	cells/mL				

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-2 PMW-2_2014-10-10 7634044 LANCASTERLABS BPX23 WATER 10/10/2014 10:15 11/23/2014	PMW-3 PMW-3_2014-10-13 7636314/035LJ-5 LANCASTERLABS/MI BPX24/035LJ WATER 10/13/2014 9:35 11/23/2014	PMW-4 PMW-4_2014-10-10 7634043 LANCASTERLABS BPX23 WATER 10/10/2014 13:05 11/23/2014	PMW-5 PMW-5_2014-10-13 7636315/035LJ-6 LANCASTERLABS/MI BPX24/035LJ WATER 10/13/2014 10:55 11/23/2014
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
75-34-3	1,1-DICHLOROETHANE	ug/l	7.5	4.9	0.5 U	2
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	33	2.6	0.5 U	6.3
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	27	110	0.87 J	2.4
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	1 J	0.94 J	0.5 U	2.7
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	2.5	0.5 U	0.5 U	0.72 J
75-01-4	VINYL CHLORIDE	ug/l	7.9	51	1.4	3.8
74-85-1	ETHENE	ug/l	82	110	11	92
74-84-0	ETHANE	ug/l	41	19	3.4 J	6.2
74-82-8	METHANE	ug/l	18000	20000	13000	18000
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	12.6	2.83		8.76
	WET CHEM					
24959-67-9	BROMIDE	mg/l	1.5 J	1.3 U	1.3 U	2.4 J
16887-00-6	CHLORIDE (AS CL)	mg/l	43.3	27.5	72.9	197
14808-79-8	SULFATE (AS SO4)	mg/l	1.5 U	9.9	140	23.4
18496-25-8	SULFIDE	mg/l	0.45	2.4	5.8	16.8
TOC	TOTAL ORGANIC CARBON	mg/l	89.3	29.2	3.2	128
DOC	DISSOLVED ORGANIC CARBON	mg/l	105	34.3	3.8	139
	DECHLORINATING BACTERIA					
DHBt	DHBt	cells/mL		498		148
DHC	DHC	cells/mL		356000		15500
VCR	VCR	cells/mL		17800		188
BVC	BVC	cells/mL		47000		157
TCE	TCE	cells/mL		448		288

Appendix C
Analytical Summary Table- 12-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-7 PMW-7_2014-10-14 7638069 LANCASTERLABS BPX25 WATER 10/14/2014 12:45 11/23/2014	PMW-8 PMW-8_2014-10-10 7634047 LANCASTERLABS BPX23 WATER 10/10/2014 15:00 11/23/2014	PMW-9 PMW-9_2014-10-13 7636316 LANCASTERLABS BPX24 WATER 10/13/2014 15:30 11/23/2014	FIELDQC TB1_2014-09-29A 7632828 LANCASTERLABS BPX22 WATER 9/29/2014 0:00 11/23/14
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 UJ	0.5 U	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	14	0.5 U	9.8	0.5 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	2.6	0.5 U	0.5 U	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	34	0.58 J	31	0.5 U
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	1.1	0.5 U	0.9 J	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	2.9	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	13	1.3	48	0.5 U
74-85-1	ETHENE	ug/l	37	46	96	
74-84-0	ETHANE	ug/l	30	1.4 J	9.4	
74-82-8	METHANE	ug/l	20000	5400	12000	
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	0.612			
	WET CHEM					
24959-67-9	BROMIDE	mg/l	1.3 U	1.3 U	1.3 U	
16887-00-6	CHLORIDE (AS CL)	mg/l	279	113	302	
14808-79-8	SULFATE (AS SO4)	mg/l	43.2	146	117	
18496-25-8	SULFIDE	mg/l	15.7	16.2	1.1	
TOC	TOTAL ORGANIC CARBON	mg/l	31.4	3.6	3.2	
DOC	DISSOLVED ORGANIC CARBON	mg/l	34.3	4.7	3.6	
	DECHLORINATING BACTERIA					
DHBt	DHBt	cells/mL				
DHC	DHC	cells/mL				
VCR	VCR	cells/mL				
BVC	BVC	cells/mL				
TCE	TCE	cells/mL				

Analytical Summary Table for Chemicals of Concern Validated 2014-Groundwater Samples Former Carborundum Company, Hyde Park Facility October 2014		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	FIELDQC TB1_2014-09-29B 7636321 LANCASTERLABS BPX24 WATER 10/13/2014 0:00 11/23/14	FIELDQC TB1_2014-09-29C 7638074 LANCASTERLABS BPX25 WATER 9/29/2014 0:00 11/23/14	FIELDQC TB1_2014-10-10 7634051 LANCASTERLABS BPX23 WATER 10/10/2014 0:00 11/23/14
CAS NO.	COMPOUND	UNITS:			
	VOLATILES				
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 UJ	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	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
75-00-3	CHLOROETHANE	ug/l	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
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	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
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	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
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				
24959-67-9	BROMIDE	mg/l			
16887-00-6	CHLORIDE (AS CL)	mg/l			
14808-79-8	SULFATE (AS SO4)	mg/l			
18496-25-8	SULFIDE	mg/l			
TOC	TOTAL ORGANIC CARBON	mg/l			
DOC	DISSOLVED ORGANIC CARBON	mg/l			
	DECHLORINATING BACTERIA				
DHBt	DHBt	cells/mL			
DHC	DHC	cells/mL			
VCR	VCR	cells/mL			
BVC	BVC	cells/mL			
TCE	TCE	cells/mL			

Appendix C
Analytical Summary Table- 6-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 6-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-4A MW-4A_040314 7419709 LANCASTERLABS BPX02 WATER 4/3/2014 10:30 5/15/2014	MW-16B MW-16B_040314 7419708 LANCASTERLABS BPX02 WATER 4/3/2014 11:25 5/15/2014	MW-18B MW-18B_040214 7419828 LANCASTERLABS BPX04 WATER 4/2/2014 16:30 5/15/2014	MW-7A MW-7A_040214 7418205 LANCASTERLABS BPX01 WATER 4/2/2014 8:15 5/15/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	2.5 U	0.5 UJ	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	3.4 J	0.5 U	12
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	5.5	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	12	2.5 U	0.5 U	16
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	3.7	2300	43	3
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	2.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	2.1	16	0.5 U	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1.2	2.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	4.1	2000	71	1
74-85-1	ETHENE	ug/l	47	700	33	1.2 J
74-84-0	ETHANE	ug/l	4.2 J	11	3.8 J	6.3
74-82-8	METHANE	ug/l	25000	16000	13000	20000
74-98-6	PROPANE	ug/l	1 U	1 U	1 U	1 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	36.2	0.0956 J	2.91	22.9
	WET CHEM					
BOD	BIOCHEMICAL OXYGEN DEMAND	mg/l	342	140	889 J	589
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	640	253	1340	1250
24959-67-9	DISSOLVED BROMIDE	mg/l	6.9	2 U	2 U	2.9
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	99	26.9	79.3 J-	25.5
DOC	DISSOLVED ORGANIC CARBON	mg/l	202	78	434	572
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	1.5 U	17.7	86.1 J+	2.3 J
18496-25-8	DISSOLVED SULFIDE	mg/l	0.17	38.3	7.7	0.067 J
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.04 UJ	0.04 UJ	0.04 U	0.04 U
14797-65-0	NITROGEN, NITRITE	mg/l	0.018 J	0.015 U	0.015 U	0.015 U
TOC	TOTAL ORGANIC CARBON	mg/l	205	69.2	427	453

Appendix C
Analytical Summary Table- 6-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 6-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-7B MW-7B_040214 7418204 LANCASTERLABS BPX01 WATER 4/2/2014 10:05 5/15/2014	MW-10B MW-10B_040214 7418203 LANCASTERLABS BPX01 WATER 4/2/2014 9:45 5/15/2014	MW-11B MW-11B_040214 7418208 LANCASTERLABS BPX01 WATER 4/2/2014 11:55 5/15/2014	MW-16A MW-16A_040214 7418202 LANCASTERLABS BPX01 WATER 4/2/2014 16:30 5/15/2014
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
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	0.5 U	2	0.5 U
75-35-4	1,1-DICHLOROETHENE	ug/l	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
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.5 U	190	0.5 U	5.9
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	0.7 J	0.92 J	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	5.5	22	1.2	140
74-85-1	ETHENE	ug/l	11	2.3 J	280	20
74-84-0	ETHANE	ug/l	1 U	1 U	3.5 J	1 U
74-82-8	METHANE	ug/l	19000	38	8300	3 U
74-98-6	PROPANE	ug/l	1 U	1 U		1 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	0.043 U	0.076 J	0.043 U	0.043 U
	WET CHEM					
BOD	BIOCHEMICAL OXYGEN DEMAND	mg/l	366	3.2 U		4.4 U
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	772	12.8 U		24.1 J
24959-67-9	DISSOLVED BROMIDE	mg/l	2 U	2 U	2 U	2 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	136	133	141	214
DOC	DISSOLVED ORGANIC CARBON	mg/l	142	4	5.4	7.4
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	117	256	158	898
18496-25-8	DISSOLVED SULFIDE	mg/l	33.3	0.054 U	27.8	0.054 U
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.4 U	0.04 U		0.04 U
14797-65-0	NITROGEN, NITRITE	mg/l	0.026 J	0.015 U		0.14
TOC	TOTAL ORGANIC CARBON	mg/l	132	4.8	5.2	7.3

Appendix C
Analytical Summary Table- 6-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 6-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-17B MW-17B_040114 7417067 LANCASTERLABS BPW99 WATER 4/1/2014 12:30 5/15/2014	PMW-1 PMW-1_040114 7417070 LANCASTERLABS BPW99 WATER 4/1/2014 11:25 5/15/2014	PMW-2 PMW-2_040114 7417076 LANCASTERLABS BPW99 WATER 4/1/2014 11:15 5/15/2014	PMW-3 PMW-3_040114 7417072 LANCASTERLABS BPW99 WATER 4/1/2014 13:58 5/15/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U	3.7	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	8.2	2.3	10	4.1
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.93 J	0.5 U
75-00-3	CHLOROETHANE	ug/l	7.4	11	44	1.6
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	1.3	0.5 U	270	250
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.73 J	0.5 U	6.1	2.6
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	19	4.3
75-01-4	VINYL CHLORIDE	ug/l	2.1	1.2	48	55
74-85-1	ETHENE	ug/l	34	15	140	120
74-84-0	ETHANE	ug/l	13	15	26	13
74-82-8	METHANE	ug/l	20000	20000	19000	14000
74-98-6	PROPANE	ug/l	1 U			
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	16.6	2.54	11.6	3.73
	WET CHEM					
BOD	BIOCHEMICAL OXYGEN DEMAND	mg/l	139			
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l	228			
24959-67-9	DISSOLVED BROMIDE	mg/l	2 U	2 U	2 U	2 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	288	10.5	34.3	26.6
DOC	DISSOLVED ORGANIC CARBON	mg/l	53.1	47.9	110	47.5
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	6.9	3.3 J	13.9	19.9
18496-25-8	DISSOLVED SULFIDE	mg/l	8.2 J-	3.8 J-	1.3 J-	6.6 J-
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l	0.04 U			
14797-65-0	NITROGEN, NITRITE	mg/l	0.016 J			
TOC	TOTAL ORGANIC CARBON	mg/l	55.1	50.6	112	45.7

Appendix C
Analytical Summary Table- 6-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 6-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-4 PMW-4_040114 7417071 LANCASTERLABS BPW99 WATER 4/1/2014 9:10 5/15/2014	PMW-5 PMW-5-033114 7415617 LANCASTERLABS BPW98 WATER 3/31/2014 14:25 5/15/2014	PMW-7 PMW-7_040114 7417073 LANCASTERLABS BPW99 WATER 4/1/2014 9:50 5/15/2014	PMW-8 PMW-8_040114 7417074 LANCASTERLABS BPW99 WATER 4/1/2014 9:08 5/15/2014
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
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	2.2	14	0.5 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	0.5 U	8.2	1.6	0.5 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	2.4	4.5	28	1.5 J
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.5 U	2.5	0.93 J	0.5 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	1.4	1.2	0.5 U
75-01-4	VINYL CHLORIDE	ug/l	1.6	4.7	16	3.5
74-85-1	ETHENE	ug/l	5.9	83	72	100
74-84-0	ETHANE	ug/l	4.1 J	6.8	24	2 J
74-82-8	METHANE	ug/l	9900	16000	22000	5400
74-98-6	PROPANE	ug/l				
	DISSOLVED METALS					
7439-89-6	IRON	mg/l		37.8	0.274 J	
	WET CHEM					
BOD	BIOCHEMICAL OXYGEN DEMAND	mg/l				
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l				
24959-67-9	DISSOLVED BROMIDE	mg/l	2 U	2.2 J	2 U	2 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	10.5	153	223	100
DOC	DISSOLVED ORGANIC CARBON	mg/l	2.5	580 J+	52.2	4.2
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	177	2.8 J	45	125
18496-25-8	DISSOLVED SULFIDE	mg/l	5.3 J-	14.9	19.9 J-	36.5 J-
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l				
14797-65-0	NITROGEN, NITRITE	mg/l				
TOC	TOTAL ORGANIC CARBON	mg/l	4.5	553	53.3	5.2

Appendix C
Analytical Summary Table- 6-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 6-month Performance Monitoring Detected Compound Summary			Dup of PMW-8			
		Location ID:	PMW-8	PMW-9	INJ-01	INJ-02
		Sample ID:	PMW-80_040114	PMW-9-033114	INJ-1_040114	INJ-2_040114
		Lab Sample Id:	7417075	7415616	7417068	7417069
		Source:	LANCASTERLABS	LANCASTERLABS	LANCASTERLABS	LANCASTERLABS
		SDG:	BPW99	BPW98	BPW99	BPW99
		Matrix:	WATER	WATER	WATER	WATER
		Sampled:	4/1/2014 12:01	3/31/2014 12:20	4/1/2014 15:20	4/1/2014 13:25
		Validated:	5/15/2014	5/15/2014	5/15/2014	5/15/2014
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
75-34-3	1,1-DICHLOROETHANE	ug/l	0.5 U	11	2.6	6.6
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	0.5 U	0.86 J	6.4	17
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.5 UJ	13	69	6.4
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	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	1.1	1.8
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.5 U	3.5	1
75-01-4	VINYL CHLORIDE	ug/l	3	20	14	3.7
74-85-1	ETHENE	ug/l	100	84	55	20
74-84-0	ETHANE	ug/l	2 J	11	23	10
74-82-8	METHANE	ug/l	5600	13000	17000	14000
74-98-6	PROPANE	ug/l				
	DISSOLVED METALS					
7439-89-6	IRON	mg/l			5.64	3.38
	WET CHEM					
BOD	BIOCHEMICAL OXYGEN DEMAND	mg/l				
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l				
24959-67-9	DISSOLVED BROMIDE	mg/l	2 U	2 U	2.4 J	2 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	104	387	26.2	21.1
DOC	DISSOLVED ORGANIC CARBON	mg/l	4	3.3 J+	153	187
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	133	111	5.2	5.6
18496-25-8	DISSOLVED SULFIDE	mg/l	36 J-	2.9	2.2 J-	2.6 J-
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l				
14797-65-0	NITROGEN, NITRITE	mg/l				
TOC	TOTAL ORGANIC CARBON	mg/l	5.5	4.8	154	186

Appendix C

Analytical Summary Table- 6-month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 6-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-05U INJ-5U_040214 7418206 LANCASTERLABS BPX01 WATER 4/2/2014 12:05 5/15/2014	INJ-05L INJ-5L_040214 7418207 LANCASTERLABS BPX01 WATER 4/2/2014 13:45 5/15/2014
CAS NO.	COMPOUND	UNITS:		
	VOLATILES			
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.5 U	0.5 U
75-34-3	1,1-DICHLOROETHANE	ug/l	18	3.3
75-35-4	1,1-DICHLOROETHENE	ug/l	0.5 U	0.5 U
75-00-3	CHLOROETHANE	ug/l	78	8.7
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	1.2	4.1
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.5 U	0.5 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.81 J	1.4
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.5 U	0.54 J
75-01-4	VINYL CHLORIDE	ug/l	2	11
74-85-1	ETHENE	ug/l	260	22
74-84-0	ETHANE	ug/l	14	13
74-82-8	METHANE	ug/l	22000	22000
74-98-6	PROPANE	ug/l		
	DISSOLVED METALS			
7439-89-6	IRON	mg/l	31	4.71
	WET CHEM			
BOD	BIOCHEMICAL OXYGEN DEMAND	mg/l		
COD	COD - CHEMICAL OXYGEN DEMAND	mg/l		
24959-67-9	DISSOLVED BROMIDE	mg/l	11.4	2.3 J
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	41.5	34.7
DOC	DISSOLVED ORGANIC CARBON	mg/l	74.5	189
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	1.6 J	14.7
18496-25-8	DISSOLVED SULFIDE	mg/l	0.054 U	1.9
14797-55-8	NITROGEN, NITRATE (AS N)	mg/l		
14797-65-0	NITROGEN, NITRITE	mg/l		
TOC	TOTAL ORGANIC CARBON	mg/l	63.6	184

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	INJ-1 INJ-1_011614 7339777 LANCASTERLABS BPW94 WATER 1/16/2014 12:25 2/26/2014	INJ-2 INJ-2_011614 7339778 LANCASTERLABS BPW94 WATER 1/16/2014 14:40 2/26/2014	INJ-5L INJ-5L_011614 7339782 LANCASTERLABS BPW94 WATER 1/16/2014 13:40 2/26/2014	INJ-5U INJ-5U_011614 7339779 LANCASTERLABS BPW94 WATER 1/16/2014 10:15 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	2.7 J	6	4.4 J	59
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	6.8	15	8.8	120 J-
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	3.5 J	5.8	12	5.2
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.8 U	2.9 J	2.1 J	1.7 J
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1 U	1 U	1 U	1.9 J
75-01-4	VINYL CHLORIDE	ug/l	4.7 J	6.8	17	3.9 J
74-85-1	ETHENE	ug/l	45	34	45	210 J+
74-84-0	ETHANE	ug/l	19	8.7	9.5	9.6
74-82-8	METHANE	ug/l	15000	13000	14000	21000
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	6.31	5.14	4.77	32.9
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l	2.3 J	3.2	2.5 J	9.4
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	26.9	29.4	38.7	38.3
DOC	DISSOLVED ORGANIC CARBON	mg/l	214	276	211	133
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	1.5 U	1.5 U	5.7 J+	1.5 U
18496-25-8	DISSOLVED SULFIDE	mg/l	0.72	2.5	2.1	0.054 U
TOC	TOTAL ORGANIC CARBON	mg/l	224	288	223	149

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-4A MW-4A_012214 7344231 LANCASTERLABS BPW97 WATER 1/22/2014 10:00 2/26/2014	MW-4B MW-4B_011614 7339776 LANCASTERLABS BPW94 WATER 1/16/2014 10:55 2/26/2014	MW-7A MW-7A_011514 7338238 LANCASTERLABS BPW93 WATER 1/15/2014 9:50 2/26/2014	MW-7B MW-7B_011314 7336000 LANCASTERLABS BPW92 WATER 1/13/2014 17:10 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	1 U	1.1 J	16	1 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	12	1 U	13	1 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	7.5	11	4 J	0.8 U
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	2.4 J	0.8 U	0.8 U	0.8 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1.1 J	1 U	1 U	1 U
75-01-4	VINYL CHLORIDE	ug/l	7.2	15	1.8 J	2 J
74-85-1	ETHENE	ug/l	65	2.8 J	2.7 J	9.4
74-84-0	ETHANE	ug/l	5 U	1 U	8.4	3 U
74-82-8	METHANE	ug/l	22000	150	17000	18000
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	39.4	0.459	39.4	0.043 U
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l	7.4	2 U	2.7	0.98 J
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	87.3	142	50.4 J+	145
DOC	DISSOLVED ORGANIC CARBON	mg/l	359	3.4	1270	52.1
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	1.5 U	298 J+	1.5 U	61.7
18496-25-8	DISSOLVED SULFIDE	mg/l	0.054 U	0.054 U	0.34	47.9
TOC	TOTAL ORGANIC CARBON	mg/l	362	3.9	1340	70.1

Appendix C
Analytical Summary Table- 3-Month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-10B MW-10B_011714 7341205 LANCASTERLABS BPW95 WATER 1/17/2014 10:10 2/26/2014	Dup of MW-10B_011714 MW-10B MW-100B_011714 7341206 LANCASTERLABS BPW95 WATER 1/17/2014 12:01 2/26/2014	MW-11B MW-11B_011414 7335999 LANCASTERLABS BPW92 WATER 1/14/2014 14:15 2/26/2014	MW-16A MW-16A_011514 7338237 LANCASTERLABS BPW93 WATER 1/15/2014 8:50 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	1 U	1 U	2.5 J	1 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	1 U	1 U	1 U	1 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	150	150	0.8 U	9
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.8 U	0.8 U	1.1 J	0.8 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1 U	1 U	1 U	1 U
75-01-4	VINYL CHLORIDE	ug/l	27	25	1.2 J	78
74-85-1	ETHENE	ug/l	2 J	1.2 J	260	6.4
74-84-0	ETHANE	ug/l	1 U	1 U	4 J	1 U
74-82-8	METHANE	ug/l	38	23	10000	3 U
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	0.0884 J	0.073 J	0.043 U	0.043 U
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l	2 U	2 U	0.075 U	2 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	128	130	141	190 J+
DOC	DISSOLVED ORGANIC CARBON	mg/l	7.2	6.7	5.6	7.4
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	250	251	120	812 J+
18496-25-8	DISSOLVED SULFIDE	mg/l	0.054 U	0.054 U	23.8	0.054 U
TOC	TOTAL ORGANIC CARBON	mg/l	7.9	7.6	8	9.5

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-16B MW-16B_011414 7336001 LANCASTERLABS BPW92 WATER 1/14/2014 10:50 2/26/2014	MW-17B MW-17B_011514 7338246 LANCASTERLABS BPW93 WATER 1/15/2014 16:25 2/26/2014	MW-18B MW-18B_011714 7341204 LANCASTERLABS BPW95 WATER 1/17/2014 11:00 2/26/2014	PMW-1 PMW-1_011514 7338245 LANCASTERLABS BPW93 WATER 1/15/2014 15:00 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	4 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	15 J	7.9	1 U	3.5 J
75-35-4	1,1-DICHLOROETHENE	ug/l	17 J	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	5 U	11	1 U	9.5
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	8800	1.8 J	28	0.98 J
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	4 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	53	1.5 J	0.8 U	1 J
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	5 U	1 U	1 U	1 U
75-01-4	VINYL CHLORIDE	ug/l	5500	2.9 J	56	2.2 J
74-85-1	ETHENE	ug/l	1500	52	41	12
74-84-0	ETHANE	ug/l	15	7.2	3.2 J	8.7
74-82-8	METHANE	ug/l	18000	19000	5000	7700
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	0.214 J	54.8	5.97	4.86
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l	0.075 U	2 U	2 U	2.1 J
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	44.8	351 J+	91.1	19.5 J+
DOC	DISSOLVED ORGANIC CARBON	mg/l	189	577	929	136
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	1.5 U	1.5 U	55.1	1.5 U
18496-25-8	DISSOLVED SULFIDE	mg/l	50.9	6.3	17.3	1
TOC	TOTAL ORGANIC CARBON	mg/l	194	454	941	149

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-2 PMW-2_011514 7338239 LANCASTERLABS BPW93 WATER 1/15/2014 12:20 2/26/2014	PMW-3 PMW-3_011414 7336003 LANCASTERLABS BPW92 WATER 1/14/2014 13:10 2/26/2014	PMW-4 PMW-4_011414 7336004 LANCASTERLABS BPW92 WATER 1/14/2014 15:20 2/26/2014	PMW-5 PMW-5_011514 7338244 LANCASTERLABS BPW93 WATER 1/15/2014 13:10 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	20	3.6 J	1 U	5.2
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	58	2.2 J	1 U	3 J
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	56	36	4 J	5.1
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	4 J	1.4 J	0.8 U	2.9 J
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1.6 J	1.9 J	1 U	1.4 J
75-01-4	VINYL CHLORIDE	ug/l	19	27	1.3 J	5
74-85-1	ETHENE	ug/l	150	87	5 J	51
74-84-0	ETHANE	ug/l	33	9.1	2.9 J	4.5 J
74-82-8	METHANE	ug/l	18000	14000	8800	12000
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	23.1	6.77	1.08	91.2
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l	3.3	0.075 U	0.075 U	2 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	38.7 J+	30.9	9.7	179 J+
DOC	DISSOLVED ORGANIC CARBON	mg/l	218	95.5	4.5	1020
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	3.7 J+	1.5 U	186	7.8 J+
18496-25-8	DISSOLVED SULFIDE	mg/l	0.33	2.4	6.7	7
TOC	TOTAL ORGANIC CARBON	mg/l	231	99.8	5	1060

Appendix C
Analytical Summary Table- 3-Month Performance Sampling

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	PMW-7 PMW-7_011514 7338242 LANCASTERLABS BPW93 WATER 1/15/2014 10:10 2/26/2014	Dup of PMW-7_011514 PMW-7 PMW-70_011514 7338243 LANCASTERLABS BPW93 WATER 1/15/2014 12:01 2/26/2014	PMW-8 PMW-8_011414 7335998 LANCASTERLABS BPW92 WATER 1/14/2014 15:50 2/26/2014	PMW-9 PMW-9_011314 7336002 LANCASTERLABS BPW92 WATER 1/13/2014 16:40 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	15	15	1 U	9.4
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	1.2 J	1.5 J	1 U	1 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	41	42	1.8 J	24
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	1.5 J	1.5 J	0.8 U	0.8 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	2.8 J	2.7 J	1 U	1 U
75-01-4	VINYL CHLORIDE	ug/l	19	17	3.7 J	48
74-85-1	ETHENE	ug/l	110	94	160	110
74-84-0	ETHANE	ug/l	16	16	2 J	6.9
74-82-8	METHANE	ug/l	20000	20000	5200	9000
	DISSOLVED METALS					
7439-89-6	IRON	mg/l	0.626	0.59		0.232 J
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l	2 U	2 U	0.075 U	0.075 U
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	229 J+	244 J+	125	405
DOC	DISSOLVED ORGANIC CARBON	mg/l	184	189	4.8	4.6
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	34.6 J+	35.3 J+	101	97
18496-25-8	DISSOLVED SULFIDE	mg/l	22.3	23.5	44.8	6.1
TOC	TOTAL ORGANIC CARBON	mg/l	196	195	7.2	6.3

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	FIELDQC TB-13050A_031213 7335997 LANCASTERLABS BPW92 WATER 3/12/2013 0:00 2/26/2014	FIELDQC TB-13346B_010714 7338236 LANCASTERLABS BPW93 WATER 1/7/2014 0:00 2/26/2014	FIELDQC TB13346-C_010714 7339775 LANCASTERLABS BPW94 WATER 1/7/2014 0:00 2/26/2014	FIELDQC TB13346-D_010714 7341203 LANCASTERLABS BPW95 WATER 1/7/2014 0:00 2/26/2014
CAS NO.	COMPOUND	UNITS:				
	VOLATILES					
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	1 U	1 U	1 U	1 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
75-00-3	CHLOROETHANE	ug/l	1 U	1 U	1 U	1 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.8 U	0.8 U	0.8 U	0.8 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1 U	1 U	1 U	1 U
75-01-4	VINYL CHLORIDE	ug/l	1 U	1 U	1 U	1 U
74-85-1	ETHENE	ug/l				
74-84-0	ETHANE	ug/l				
74-82-8	METHANE	ug/l				
	DISSOLVED METALS					
7439-89-6	IRON	mg/l				
	WET CHEM					
24959-67-9	DISSOLVED BROMIDE	mg/l				
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l				
DOC	DISSOLVED ORGANIC CARBON	mg/l				
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l				
18496-25-8	DISSOLVED SULFIDE	mg/l				
TOC	TOTAL ORGANIC CARBON	mg/l				

Analytical Summary Table for Chemicals of Concern Validated 2014 -Annual Groundwater Samples Former Carborundum Company, Hyde Park Facility 3-month Performance Monitoring Detected Compound Summary		Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	FIELDQC TB13346-E_010714 7344230 LANCASTERLABS BPW97 WATER 1/7/2014 0:00 2/26/2014
CAS NO.	COMPOUND	UNITS:	
	VOLATILES		
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.8 U
75-34-3	1,1-DICHLOROETHANE	ug/l	1 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.8 U
75-00-3	CHLOROETHANE	ug/l	1 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.8 U
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.8 U
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.8 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	1 U
75-01-4	VINYL CHLORIDE	ug/l	1 U
74-85-1	ETHENE	ug/l	
74-84-0	ETHANE	ug/l	
74-82-8	METHANE	ug/l	
	DISSOLVED METALS		
7439-89-6	IRON	mg/l	
	WET CHEM		
24959-67-9	DISSOLVED BROMIDE	mg/l	
16887-00-6	DISSOLVED CHLORIDE (AS CL)	mg/l	
DOC	DISSOLVED ORGANIC CARBON	mg/l	
14808-79-8	DISSOLVED SULFATE (AS SO4)	mg/l	
18496-25-8	DISSOLVED SULFIDE	mg/l	
TOC	TOTAL ORGANIC CARBON	mg/l	

APPENDIX D

MASS DISCHARGE CALCULATIONS

TABLE 1
MASS DISCHARGE CALCULATION EQUATIONS USED
HYDE PARK SITE
NIAGARA FALLS, NY

Example Equation: Overburden Section 1- 2014

Flow $$Q_{S1T1} = K_{S1T1} I_{S1T1} A_{S1T1}$$

S1 = Section 1, T1 = Time 2014

K =	0.37	ft/day	hydraulic conductivity
i =	0.00456	ft/ft	gradient
A =	42	ft^2	area
Q =	0.07	ft^3/day	gw flow

Mass Discharge

$$MF_{S1T1} = Q_{S1T1} \bullet C_{S1T1}$$

Q_{S1T1} =	0.07	ft^3/day	
	2.022	L/day	convert to Liters/day
C_{S1T1} =	14.58	µg/L	concentration for that section
MD_{S1T1}=	29.48	µg/day	mass discharge

Notes/Assumptions:

1. Concentrations are Total VOC concentrations (sum of PCE, TCE, Total DCE, VC, 1,1,1-TCA, and 1,1-DCA collected in October 2014 and August 2008. Half of the detection limit was used for non-detect concentrations.

2. For overburden. K values are the calculated Geometric mean of overburden wells from the 1993 PSA report for MW-1A through MW-5A.

3. For bedrock, K values are the calculated Geometric mean of bedrock wells from the 1997 RI report for MW-7B and MW-12B.

TABLE 2
MASS DISCHARGE CALCULATION RESULTS
HYDE PARK SITE
NIAGARA FALLS, NY

Overburden			
	Mass Discharge (μg/day)		
	2008	2014	Percent reduction
Section 1	530.7	29.5	94.4
Section 2	1070.8	17.9	98.3
Section 3	13480.2	96.1	99.3
Section 4	1471.8	315.1	78.6
Section 5	1024.1	418.7	59.1
Overall (μg/ft-day)	1464.8	73.1	95.0

Bedrock			
	Mass Discharge (μg/day)		
	2008	2014	Percent reduction
Section 1	11339.3	593.7	94.8
Section 2	16689.3	261.9	98.4
Section 3	3803.2	869.7	77.1
Overall (μg/ft-day)	2652.6	143.8	94.6

TABLE 3
OVERBURDEN MASS DISCHARGE CALCULATIONS
Hyde Park Site, Niagara Falls, NY

K (ft/s)	4.31886E-06
depth (ft)	3.5
Section length (ft)	12

Section 1

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (ug/L)
2014			
MW-2A	12.9	15.4	14.6
PMW-1	27.5	12.9	
		Mass discharge (mg/day)	
		29.5	
2008			
MW-2A	12.9	24.1	262.5
PMW-1	27.5	770.6	
		Mass discharge (mg/day)	
i (ft/ft)			
0.0046		530.7	
A (ft2)	Q (ft3/d)	Percent reduction	
42	0.07	94.4	

Section 2

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
PMW-1	0.0	12.9	12.9
		Mass discharge (mg/day)	
		17.9	
2008			
PMW-1	0.0	770.6	770.6
		Mass discharge (mg/day)	
i (ft/ft)		1070.8	
0.0031			
A (ft2)	Q (ft3/d)	Percent reduction	
42	0.05	98.3	

Section 3

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
PMW-2	0.0	47.2	47.2
		Mass discharge (mg/day)	
		96.1	
2008			
PMW-2	0.0	6616.7	6616.7
		Mass discharge (mg/day)	
i (ft/ft)		13480.2	
0.0046			
A (ft2)	Q (ft3/d)	Percent reduction	
42	0.07	99.3	

Section 4

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
PMW-3	0.0	168.6	168.6
		Mass discharge (mg/day)	
		315.1	
2008			
PMW-3	0.0	787.6	787.6
		Mass discharge (mg/day)	
i (ft/ft)		1471.8	
0.0042			
A (ft2)	Q (ft3/d)	Percent reduction	
42	0.07	78.6	

Section 5

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
PMW-3	17.9	168.6	
MW-16A	38.2	361.1	230.0
		Mass discharge (ug/day)	
		418.7	
2008			
PMW-3	17.9	787.6	
MW-16A	38.2	82.4	562.6
		Mass discharge (ug/day)	
i (ft/ft)		1024.1	
0.0041			
A (ft2)	Q (ft3/d)	Percent reduction	
42	0.06	59.1	

Notes:

1. Depth of 3.5 feet used which represents a vertical profile of 1.5 feet of sand and 2 feet of overburden at the top of bedrock.

2. Sections lengths are 12 feet (see Overburden Figure).

3. Concentrations at MW-2A and PMW-1 were used to interpolate the concentration for Section 1 based on distance from the mid-point of the section to these well locations.

4. Assume that the concentration of Section 2 is the same as PMW-1, that the concentration of Section 3 is the same as PMW-2, and that the concentration of Section 4 is the same as PMW-3.

5. Concentrations at PMW-3 and MW-16A were used to interpolate the concentration for Section 5 based on distance from the mid-point of the section to these well locations.

TABLE 3 (continued)
BEDROCK MASS DISCHARGE CALCULATIONS
Hyde Park Site, Niagara Falls, NY

K (ft/s)	5.47E-05
depth (ft)	varies
Section length (ft)	12

Section 1

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
PMW-5	0.0	12.9	12.9
		Mass discharge (mg/day)	
		593.7	
2008			
PMW-5	0.0	245.8	245.8
		Mass discharge (mg/day)	
i(ft/ft)		11339.3	
0.0020			
Depth (ft)	6.5		
A (ft2)	Q (ft3/d)	Percent reduction	
78	1.63	94.8	

Note: PMW-5 was first sampled in Oct 2009

Section 2

Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
MW-17B	0.0	7.4	7.4
		Mass discharge (mg/day)	
		261.9	
2008			
MW-17B	0.0	470.3	470.3
		Mass discharge (mg/day)	
i(ft/ft)		16689.3	
0.0044			
Depth (ft)	5		
A (ft2)	Q (ft3/d)	Percent reduction	
60	1.25	98.4	

Section 3

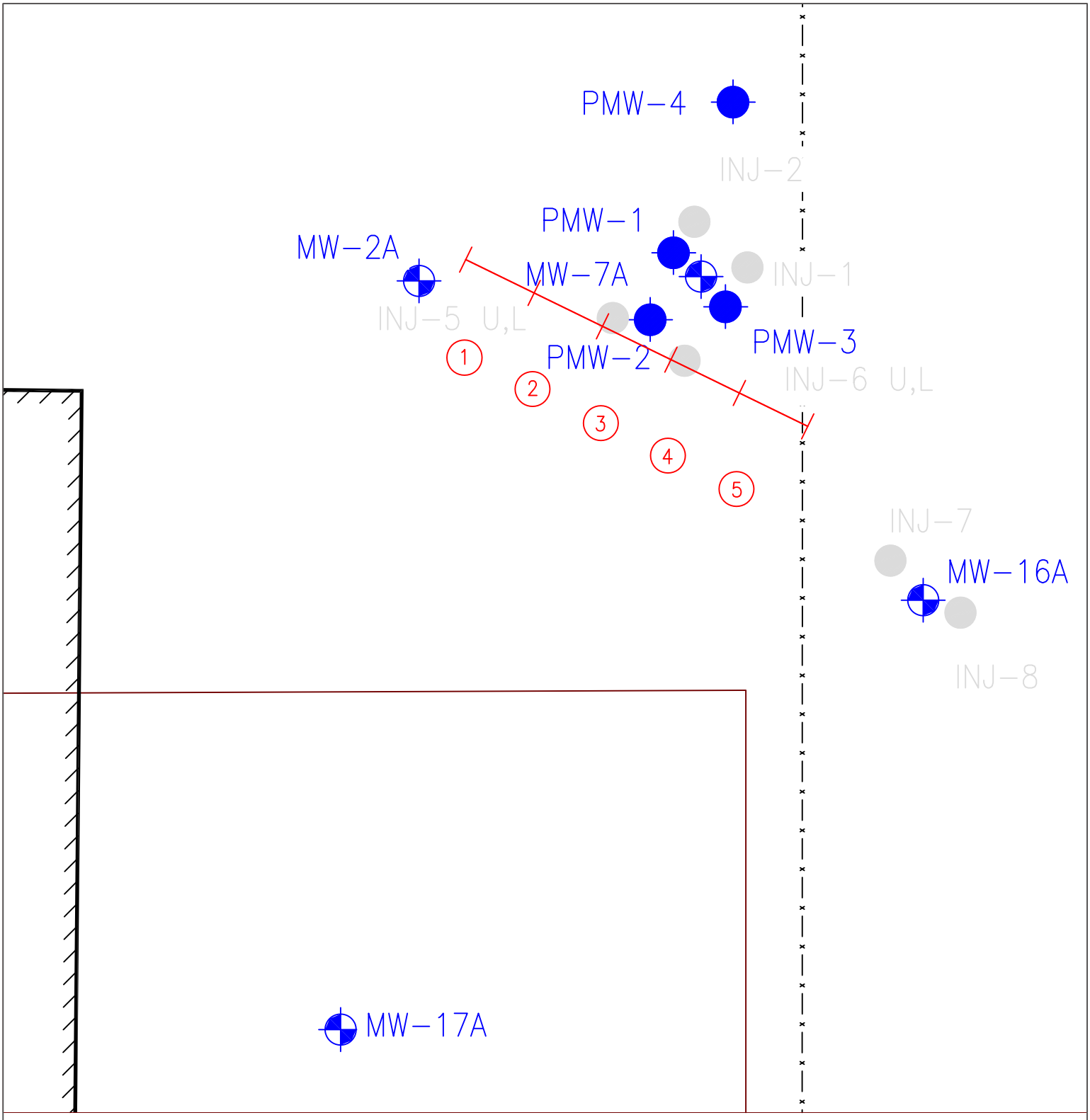
Wells	Distance to Section (ft)	Concentrations (µg/L)	Interpolated Concentration of the Section (µg/L)
2014			
PMW-7	0.0	66.3	66.3
		Mass discharge (mg/day)	
		869.7	
2008			
PMW-7	0.0	289.7	289.7
		Mass discharge (mg/day)	
i(ft/ft)		3803.2	
0.0013			
Depth (ft)	6.5		
A (ft2)	Q (ft3/d)	Percent reduction	
78	0.46	77.1	

Note: PMW-7 was first sampled in Oct 2009

Notes:
1. Depth used includes screen length or open borehole length for each well (PMW-5 and PMW-7 = 6.5' and MW-17B = 5.0')

2. Sections lengths are 12 feet (see Bedrock Figure).

3. Assume that the concentration of Section 1 is the same as PMW-5, that the concentration of Section 2 is the same as MW-17B, and that the concentration of Section 3 is the same as PMW-7.



LEGEND:

— x — x — x —	FENCE
MW-5A	OVERBURDEN MONITORING WELL LOCATION
PMW-1	OVERBURDEN PERFORMANCE MONITORING WELL LOCATION
INJ-7	OVERBURDEN INJECTION WELL LOCATION
1	SECTION NUMBER
	SECTION

30 20 10 0 30

SCALE IN FEET

N

Overburden Mass Discharge Sections

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

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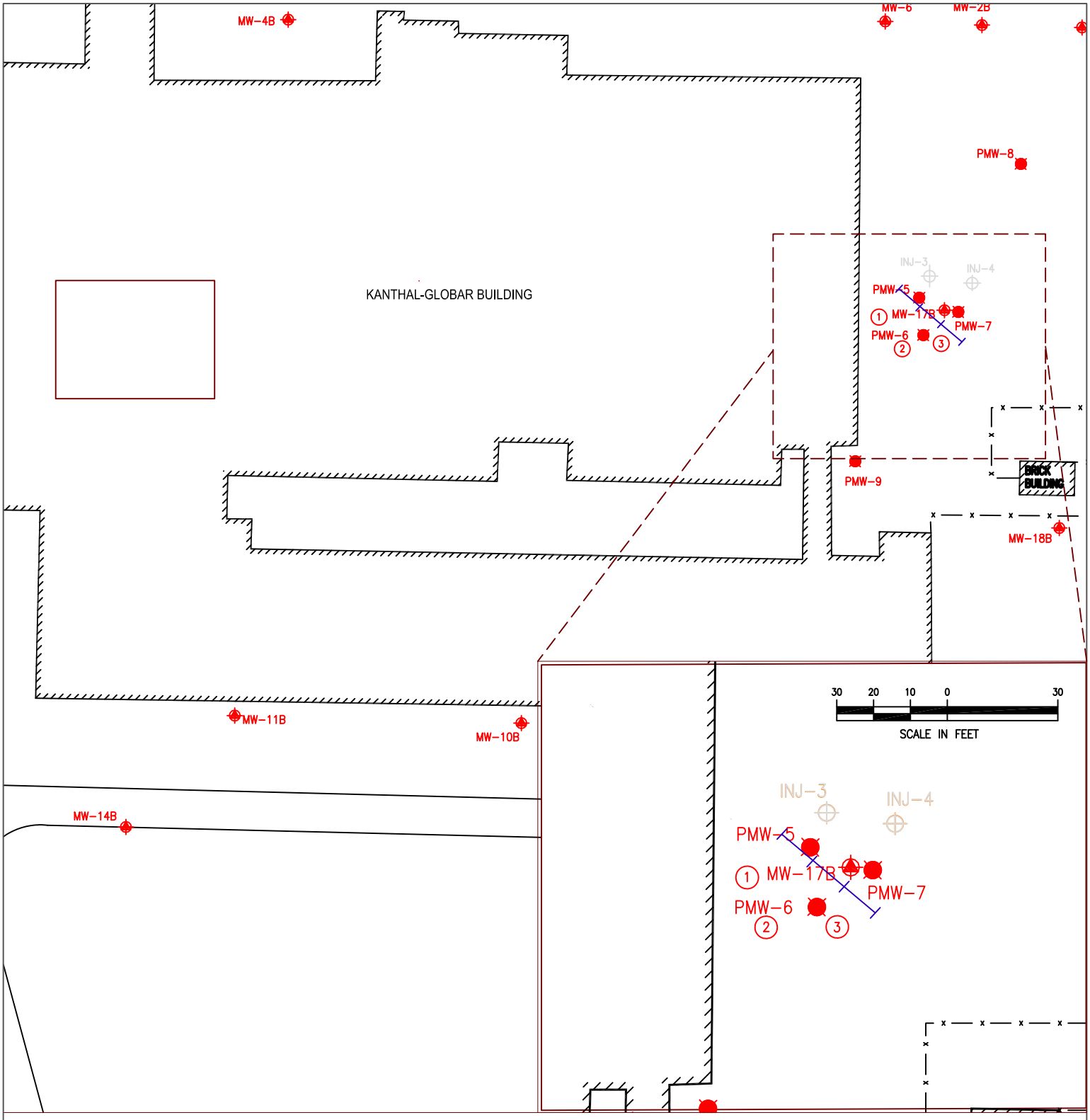

LEGEND:

— x — x — x —	FENCE
MW-17B	BEDROCK MONITORING WELL LOCATION
PMW-9	BEDROCK PERFORMANCE MONITORING WELL LOCATION
INJ-3	BEDROCK INJECTION WELL LOCATION
1	SECTION NUMBER
	SECTION

60 40 20 0 60

SCALE IN FEET

Bedrock Mass Discharge Sections

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40 LA RIVIERE DRIVE, SUITE 350,
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