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April 2020

Fall 2019 Annual Groundwater Monitoring Report, Former Carborundum Company, Hyde Park Facility Town of Niagara, Niagara County, NY NYSDEC Site No. 932036

Submitted to:

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

On behalf of:

Elm Holdings Inc.

AECOM Environment

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1.0 Introduction

This Fall 2019 Annual Groundwater Monitoring Report summarizes the groundwater monitoring activities completed at the Former Carborundum Company, Hyde Park Facility (Site) in the Town of Niagara, New York (see Figure 1 – Project Location Plan). This report provides the results from the recent Fall 2019 annual monitoring event conducted from November 26 through December 5, 2019, with a comparison to previous results. The annual groundwater monitoring is conducted on an alternating spring (even years)/fall (odd years) schedule, and includes the collection of groundwater samples for the analysis of chlorinated volatile organic compounds (CVOCs) and natural attenuation parameters.

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

The scope of the Spring 2019 annual groundwater monitoring program included:

- Collection of water level measurements from overburden and bedrock monitoring wells, injection wells, and performance monitoring wells;
- Purging of select overburden and bedrock monitoring wells and collection of field measurements of pH, temperature, specific conductivity, oxidation/reduction potential (ORP), dissolved oxygen (DO), and turbidity;
- Collection of groundwater samples from monitoring wells for specific CVOC analyses; and,
- Collection of groundwater samples from select overburden and bedrock monitoring wells for analysis of natural attenuation parameters.

Figure 2 – Site Plan presents monitoring well locations, injection well locations, performance monitoring well locations, and site features.

2.0 Site Remedial Summary

The following section briefly summarizes the remedial work completed at the Site. Primary tasks included emulsified vegetable oil substrate injections in 2008, 2009, 2011 and 2013, and associated performance groundwater monitoring events. Terra Systems, Inc. (TSI) SRS®-SD was used for all overburden injections, SRS®-FR was used for all bedrock injections, and TSI-DC® bioaugmentation culture was used for microorganism bioaugmentation. Additional detail regarding Site background and remedial summaries are presented in event-specific performance reports and Five-Year Review Reports.

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

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

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

3.0 Groundwater Monitoring Program Summary

The Fall 2019 annual groundwater monitoring program included water level measurements, groundwater sampling at 17 well locations, and submission of groundwater samples for analysis of CVOCs and natural attenuation parameters. Quality assurance/quality control (QA/QC) samples, including one field duplicate, one matrix spike/matrix spike duplicate sample, and four trip blanks were also collected and submitted for analysis. Table 1 presents a summary of groundwater sample locations and associated QA/QC samples.

3.1 Groundwater Elevation Measurements

Water levels were measured on November 26, 2019 in the monitoring wells, injection wells, and performance monitoring wells relative to the top of the inner well casing using an electronic water level tape accurate to 0.01 foot (ft). The depth to water was measured in each well from a surveyed point on the casing. The water levels were then converted to elevations presented as feet above mean sea level (ft AMSL, NAVD 88 datum). The groundwater elevations were used to construct groundwater elevation contour maps in both the overburden and bedrock zones. Table 2 provides a summary of the groundwater level measurements and calculated groundwater elevations. Figure 3 presents overburden groundwater contours and Figure 4 presents bedrock groundwater contours. Section 4.1 presents a discussion of groundwater elevations and flow directions.

3.2 Groundwater Sampling

The locations of the 17 monitoring wells sampled are shown in Figure 2. Wells were sampled following the methodology outlined in the groundwater monitoring work plan and approved revisions per subsequent correspondence with NYSDEC. A list of wells, dates sampled, sample IDs, and purge volumes is provided in Table 1. A copy of the groundwater sampling logs is provided in Appendix A. As described in the Site Management (SM) Periodic Review Report (PRR) Response letter from the NYSDEC dated October 6, 2018, four locations (MW-2B, MW-4A, MW-8, and MW-11B), are no longer required to be sampled as part of the annual groundwater monitoring program.

During purging, groundwater was monitored for temperature, specific conductivity, pH, DO, ORP, and turbidity. An aliquot of the groundwater sample was tested in the field for alkalinity, carbon dioxide, ferrous iron, and hydrogen sulfide using Hach™ test kits. Table 3 presents a summary of the groundwater sampling field parameter results.

The 17 monitoring wells were purged following low-flow procedures with dedicated tubing and a peristaltic pump. MW-12A was found to be destroyed during this sampling event and therefore was not sampled as planned. All samples for chemical analyses were hand-delivered to Eurofins TestAmerica Laboratories, Inc., (TAL) in Amherst, New York under secure chain-of-custody (COC). TAL Amherst analyzed the short-hold time analyses (chloride, sulfate, nitrate, and biological oxygen demand [BOD]) and transferred the remaining samples to TAL, Canton, Ohio which performed the remaining analyses. Both TAL locations are New York State Department of Health Environmental Laboratory Approval Program certified laboratories.

In addition to the collection of the routine annual samples, Microbial CENSUS analyses for dechlorinating bacteria (*Dehalococcoides* and *Dehalobacter*) and reductase enzymes were collected

at six sampling locations (MW-6, MW-7A, MW-10A, MW-10B, MW-18A, and MW-18B). Microbial analyses were collected in combination with the annual sampling suite for baseline sampling to evaluate additional *in situ* bioremediation injections for remedy enhancement at the Site. The proposed remedy enhancement and pilot study is described in the October 2019 letter work plan entitled *2019 Remedy Enhancement Evaluation Work Plan* (AECOM 2019). Samples for microbial analyses were packed in a cooler on ice and shipped for next day delivery to Microbial Insights laboratory in Knoxville, Tennessee.

Table 4 provides a summary of sample collection and analysis specifications for each analysis type including sample containers, preservation methods, analytical methods, and other quality control information.

Table 5 presents a summary of scheduled analyses for each well sampled. Samples from each well were analyzed for select CVOCs, including tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), trans-1,2-DCE, 1,1-DCE, 1,1-dichloroethane (DCA), 1-1-1-trichloroethane (TCA), vinyl chloride (VC), and chloroethane. In addition, samples from 14 wells consisting of two overburden wells and six overburden and bedrock well pairs were analyzed for natural attenuation evaluation parameters, consisting of:

- dissolved iron;
- methane, ethane, ethene, and propane;
- chloride, sulfate, and sulfide; and,
- total organic carbon (TOC), BOD, chemical oxygen demand, and total chloride, nitrate, and sulfate.

The six well pairs chosen for these additional analyses are located within, upgradient, downgradient, and side gradient of the source area, and consist of MW-5A and -5B, MW-7A and -7B, MW-10A and -10B, MW-16A and -16B, MW-17A and -17B, and MW-18A and -18B. A seventh well pair, MW-12A and MW-12B, has historically also been sampled; but, in 2019 MW-12A was found destroyed and only MW-12B was sampled

Nitrite is a short hold time analysis listed in Table 5 and volume was submitted to the laboratory for nitrite analysis in a laboratory-supplied bottle with other short-hold analyses. Due to a miscommunication with the laboratory nitrite was not analyzed in Fall 2019. Historically, nitrite has mostly been non-detect at all locations sampled.

Purge water and decontamination water were contained and staged in a holding tank or new steel 55-gallon drum for later characterization and proper disposal.

3.3 Data Validation

Analytical results for samples collected December 3 through 5, 2019 were reviewed by AECOM for usability with respect to the following requirements:

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

The data submitted by the laboratory have been reviewed and validated. The analytical data were found to be acceptable in terms of deliverable completeness, accuracy, precision, representativeness,

completeness and comparability. Data validation was performed in accordance with the most current editions of the USEPA Region II SOPs and NYSDEC ASP for organic and inorganic data review.

Analytical holding times, laboratory control sample recoveries, laboratory method blanks, MS/MSD precision and accuracy for designated spiked project samples, and surrogate recoveries associated with project samples, were considered acceptable with the following exceptions:

The dissolved iron continuing calibration and/or method blanks associated with samples MW-12B, MW-16A, and MW-16B exhibited contamination above the method detection limit (MDL), but below the quantitation limit (QL). The dissolved iron results for these samples were qualified 'U' at the QL.

The laboratory control samples (LCS) associated with samples MW-7A, MW-10A, MW-17B, and MW-18B exhibited biased low percent recovery (%R) for BOD. The BOD results for these samples have been qualified 'J-' or 'UJ'.

The matrix spike/matrix spike duplicate (MS/MSD) performed on sample MW-7A exhibited biased high %R for cis-1,2-DCE and VC. The results for these VOCs in this sample have been qualified 'J'.

The sample data are considered usable and valid for their intended purpose. Those results qualified 'J', 'J-', 'U', or 'UJ' during the data review are considered conditionally usable. A copy of the data usability summary report (DUSR) for groundwater samples is included in Appendix B.

4.0 Groundwater Monitoring Program Summary

4.1 Groundwater Elevations and Flow Directions

A summary of groundwater elevation monitoring for the Spring 2018 annual event is provided in Table 2, including New York State Plane Coordinate System location coordinates, top of casing elevation, depth to water and calculated groundwater elevations for the monitoring wells, injection wells, and performance monitoring wells.

Figure 3 presents an overburden groundwater contour map based on the November 26, 2019 water level data. Overburden groundwater was measured at elevations between 591.00 ft AMSL (MW-4A) in the northwest portion of the Site to 585.48 ft AMSL (MW-14A) in the southwest corner of the Site; however; the MW-4A water level was anomalous when compared with the other locations and with historical data and not used for contouring purposes in Figure 3. Location INJ-6U in the north central area of the site had the next highest elevation in overburden (590.87 ft AMSL). In general, groundwater flow is from northeast to southwest. A localized area of a slight groundwater mound was noted near the north central region of the Site though overall overburden groundwater in the northern and eastern half of the site exhibited little change in slope. Gradients and flow directions become more defined toward the southwest corner of the site.

Figure 4 presents a bedrock groundwater potentiometric surface contour map based on the November 26, 2019 water level data. Bedrock groundwater elevations ranged from 593.25 ft AMSL (MW-19B) on the east side of the Site to 587.83 ft AMSL (MW-11B) in the southwest corner of the Site. There is a localized area of a groundwater mound in the central part of the site near INJ-4 (591.03 ft AMSL). The general bedrock groundwater flow direction is west/southwesterly towards Hyde Park Boulevard and Rhode Island Avenue, consistent with historical observations of groundwater flow. MW-15 was not measured on November 26, 2019 due to health and safety concerns (traffic and road access in Hyde Park Boulevard); MW-15 was last measured during its most recent 5-year sampling event on June 14, 2018 at 587.31 ft AMSL, consistent with the west/southwesterly gradient observed on November 26, 2019.

Downward vertical gradients were observed more commonly in overburden/bedrock well pairs in the northeast and central portions of the Site; upward vertical gradients were observed more commonly in well pairs in the south/southwest portion of the Site.

4.2 Data Summary

Groundwater samples collected during the Fall 2019 annual groundwater monitoring program were submitted to the analytical laboratory for select CVOC analysis and other parameters as discussed in Section 3.2 and as summarized on Tables 4 and 5. Field measurements for the sampling program are provided in Table 3. A summary of the Fall 2019 analytical laboratory data is provided in Table 6. Figure 5 presents select CVOC concentrations in overburden groundwater for 2000 and 2009 through 2019 and Figure 6 presents select CVOC concentrations in bedrock groundwater for the same time period. Analytical data results from monitoring well samples for the period October 2007 through December 2019 are included in Appendix C.

Comments are noted below for wells where concentrations or trends varied from recent and historical monitoring data.

4.2.1 Long-term Bioremediation Results

Figure 7 illustrates the long-term time-series plots for total CVOCs at source area and downgradient wells indicating the improvement in groundwater conditions that has occurred as the result of enhanced bioremediation activities. Source area wells MW-4A, MW-7A, MW-16A, and MW-17B exhibited mainly steady, elevated levels of total CVOCs prior to injections, followed by significant, two to three order of magnitude decreases in concentration following the injections.

Bioremediation injections from 2008 to 2013 were also intended to decrease total CVOCs in downgradient wells over time. Downgradient wells MW-11B, MW-12B, MW-14B, and MW-15 exhibited slowly decreasing levels of total CVOC concentrations prior to injections, followed by significant decreases of approximately two orders of magnitude relative to pre-2008 total CVOC concentrations (Figure 7).

4.2.2 CVOC Results

Groundwater samples from 17 monitoring wells (6 overburden and 11 bedrock) were collected and analyzed for CVOCs. Overall, concentrations of CVOCs at most of the sample locations have decreased or remained stable since 2000. Over the past few sampling events, there are select locations that have shown a slight increase from post-injection low results for TCE degradation products DCE and/or VC (MW-5B, MW-7A, MW-10B, and MW-12B). The overall total CVOC reductions are due to both natural attenuation and enhanced biodegradation that included four rounds of vegetable oil substrate injections in 2008, 2009, 2011, and 2013.

Figures 8 through 15 are examples that illustrate long-term trends for six overburden and ten bedrock wells. The time-series plots typically show gradual decreasing trends in TCE and DCE, and in some cases, stable trends, followed by significant decreases in concentrations following injection events. Most of these plots show stable VC concentrations prior to the injections, followed by significant decreases after the injections, and a slight increase of DCE degradation product VC in the most recent round of sampling in the wells mentioned above.

4.2.2.1 Overburden Results

Figure 5 shows a summary of the overburden well CVOC analytical results from the Fall 2019 annual sampling program, the data from the most recent ten previous annual sampling programs, and data from 2000 as a reference point. The results for the six overburden groundwater samples were generally consistent with previous rounds of monitoring and long-term trends. Key observations are listed below.

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

The concentration of TCE at MW-7A in Fall 2019 was below groundwater standards[1] and consistent with historical post-injection concentrations. However, the concentrations of DCE, DCA, and VC at

[1] NYSDEC Technical & Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations and revisions

MW-7A were lower than in April 2018 (DCE and VC) but slightly higher than post-injection sampling events as of April 2016 and above groundwater standards (Figures 7 and 8). MW-7A was in the area of highest CVOCs in shallow groundwater prior to the first injection, and was within the area that was targeted during the emulsified vegetable oil substrate injections in 2008, 2009, 2011 and 2013. MW-7A will continue to be monitored as a part of the annual sampling program.

MW-16A was targeted in the November 2011 injection event to address VC concentrations, but only a negligible amount of substrate was injected due to low permeability of the soils. Concentrations of TCE and DCA have been below groundwater standards since 2007, DCE has been below 10 micrograms per liter (µg/L) since 2012 and was below groundwater standard this event (3.6 µg/L), and VC is showing a general decreasing trend over time (Figures 7 and 14). MW-16A will continue to be monitored as a part of the annual sampling program.

MW-17A is an overburden well in the area of targeted bedrock injections in 2009 and 2013. DCE was lower than recent historical data for the second year in a row and TCE, VC, and DCA concentrations were consistent with previous historical data. Since 2009, TCE has been reduced to non-detect, DCE (50 µg/L) has steadily decreased to less than one-half the 2000 concentration (230 µg/L), while VC (83 µg/L) has steadily increased as compared to pre-injection concentration (18 µg/L). These results indicate reductive dechlorination is taking place. MW-17A will continue to be monitored as a part of the annual sampling program.

Overburden Downgradient Wells:

MW-5A, located south of the east end of the former facility building, showed sporadic increases and decreases in DCE and VC before and after substrate injections in 2009, 2011, and 2013 (Figure 9). Fall 2019 data for DCE, VC, and DCA decreased from Spring 2018 (Figure 9). There appears to be a direct relationship between degradation product concentrations and water level fluctuations in MW-5A. Furthermore, there is a consistent upward hydraulic gradient between the bedrock and overburden zones at this location. MW-5A will continue to be monitored as a part of the annual sampling program.

MW-10A, located central to and south of the former facility building, showed similar concentrations to the previous sampling event (Figure 10). TCE remained at or below analytical detection limits at this location. Groundwater measurements indicate an upward hydraulic gradient between MW-10A and MW-10B (from bedrock to overburden). MW-10A will continue to be monitored as a part of the annual sampling program.

MW-12A, located west of the former facility building along Hyde Park Boulevard, was found destroyed at the time of this sampling event and no sample was collected. Recent historical data are presented on Figure 11.

MW-18A, located east of the former facility building, showed VC and DCA below groundwater standard for the third consecutive event, and TCE (32 µg/L) and DCE (43 µg/L) at similar concentrations as compared to 2010 through 2018 concentrations (Figure 5). MW-18A will continue to be monitored as a part of the annual sampling program.

4.2.2.2 Bedrock Results

Figure 6 shows a summary of the bedrock well CVOC analytical results from the Fall 2019 annual sampling program, data from the most recent ten previous annual sampling events, and data from 2000 as a reference point. Key observations are listed below.

Bedrock Source Area Wells:

Significant reductions in DCE and VC concentrations have been observed in MW-6 relative to 2000 concentrations, which were measured prior to bioremediation injections in the area of MW-7A in 2008. Since 2009, DCE (85 µg/L in 2009 to 10 µg/L in 2019) has continued to steadily decrease while VC (78 µg/L in 2019) was at the upper end but within the observed range at his location. The reduction of DCE with a generally stable VC concentration indicates natural attenuation is continuing to occur, although the rate of reduction of VC is less than that of DCE. TCE and DCA have consistently been non-detect or detected at an estimated concentration below the groundwater standard since 2000. MW-6 will continue to be monitored as a part of the annual sampling program to monitor progress of attenuation of DCE and VC.

Significant reductions in DCE and VC concentrations have been observed in MW-7B relative to 2000 concentrations, which were measured prior to bioremediation injections in the area of MW-7A in 2008. TCE, DCE, and DCA have been below groundwater standard since 2012. The VC concentration (10 µg/L) was at the low end of the historic range and shows a decrease from 2018 and 2019 events. MW-7B will continue to be monitored as a part of the annual sampling program to monitor progress of attenuation of VC.

TCE, DCE, and VC concentrations increased at MW-16B in early 2012 and 2013 after injections were performed at overburden injection wells (INJ-6L, INJ-7 and INJ-8) in the vicinity of MW-16A in October 2011. TCE concentrations decreased in 2013 and have remained below groundwater standard since that time. DCE and VC concentrations remained elevated through 2015 and then sharply decreased in 2016, with DCE below groundwater standard and VC only slightly above groundwater standard in the most recent four monitoring events (Figure 5 and Figure 14). MW-16B will continue to be monitored as a part of the annual sampling program to monitor progress of attenuation of VC.

TCE concentration in MW-17B has been non-detect for more than the past decade except for an estimated value in 2017 (0.68 J µg/L), and DCE was above standard in Fall 2019 (11 µg/L) (Figure 5). VC concentrations decreased over the course of the bioremediation injections from 69 µg/L in 2000 to 0.88 µg/L in April 2016, and more recently have ranged from 7.9 µg/L in 2018 to 14 µg/L in 2019. MW-17B is located within the area of the bedrock bioremediation injections performed in November 2009 and September 2013 and was the location of the highest CVOCs in bedrock prior to bioremediation activities. MW-17B will continue to be monitored as a part of the annual sampling program to monitor progress of attenuation of VC.

At MW-18B, TCE and DCA have consistently been non-detect at the reporting limit since 2009. DCE and VC concentrations have fluctuated since 2009, with historical lows occurring in November 2015 following injections at MW-18B in September 2013. DCE and VC showed increases in April 2016 and September 2017 followed by decreases in April 2018 and December 2019 (56 µg/L for DCE and 70 µg/L for VC in 2019) (Figure 15). MW-18B will continue to be monitored as a part of the annual sampling program to monitor progress of attenuation of DCE and VC.

MW-19B is located east of the main facility in the area remediated as part of Operable Unit 1. Concentrations of TCE and DCA were below groundwater standards from 2012 through 2019. Concentrations of DCE and VC increased above groundwater standards in 2018 but were once again below standards in December 2019. MW-19B will continue to be monitored as a part of the annual sampling program to monitor progress of attenuation of DCE and VC.

Bedrock Downgradient Wells:

At MW-5B, TCE has consistently been non-detect or detected at an estimated concentration near the reporting limit since 2000, indicating this area is not a source area for TCE. Total concentrations of DCE and VC have remained relatively constant since 2009, with a slightly decreasing trend of DCE and an increasing trend of VC indicating ongoing reductive dechlorination (Figure 9). MW-5B will continue to be monitored as a part of the annual sampling program.

At MW-10B, TCE has consistently been non-detect since 2009, indicating this area is not a source area for TCE. In addition, DCA has consistently been non-detect or detected at a concentration near the reporting limit and below groundwater standard since 2000. DCE and VC concentrations have remained relatively constant since 2009 (Figure 10). MW-10B will continue to be monitored as a part of the annual sampling program.

At downgradient location MW-12B, TCE has consistently been non-detect or detected at an estimated concentration near the reporting limit since 2000, indicating this area is not a source area for TCE. In addition, DCA has consistently been non-detect or detected at a concentration near the reporting limit and below groundwater standard since 2000. Significant reductions in DCE and VC concentrations have been observed in MW-12B relative to concentrations measured prior to bioremediation injections in the vicinity of MW-17B in 2009. Concentrations of DCE and VC increased following injections in the vicinity of MW-17B in 2013 and have remained relatively stable since (Figures 7 and 11). MW-12B will continue to be monitored as a part of the annual sampling program to monitor attenuation of DCE and VC.

Significant reductions in TCE, DCE, and VC concentrations have also been observed in downgradient well MW-14B relative to concentrations measured prior to bioremediation injections (Figures 7, 12, and 13). Including December 2019 data, TCE, DCE, and DCA concentrations have been below groundwater standards since 2011. VC concentrations had been below groundwater standards since August 2013, except for a September 2017 VC concentration of 2.9 µg/L; VC concentrations in December 2019 were below groundwater standard (0.7 J µg/L). It is recommended that MW-14B continue to be monitored as part of the annual sampling program to monitor for perimeter concentrations of constituents of concern.

MW-15B is currently sampled every five years. The well was last sampled on June 14, 2018. Consistent with prior results, TCE and DCA concentrations were below groundwater standard. DCE and VC concentrations increased above groundwater standards (5.2 µg/L for DCE and 16 µg/L for VC), similar to May 2010 concentrations.

4.2.3 Attenuation Monitoring Results

As part of the ongoing groundwater sampling program, natural attenuation parameters have been sampled during each monitoring event (see Table 5 and Appendix C). The results for December 2019 were generally consistent with previous monitoring events, with the following exceptions:

- A decrease in TOC from 2014 to 2015 was observed in wells targeted during the 2013 injections, including overburden wells MW-4A and MW-7A, and bedrock wells MW-16B, MW-17B, and MW-18B. TOC concentrations in these wells remain above pre-injection concentrations, although MW-7A, MW-16B, and MW-18B decreased in December 2019 as compared to April 2018.
- From 2014 to 2015, increases in ethene concentrations at wells MW-10B, MW-16A, and MW-16B were noted. Ethene concentrations in 2016 through 2019 are noted to be lower in each location as compared to 2015 levels; although, MW-16A increased compared to the last 2 sampling rounds. Ethene is the final degradation product of TCE, providing solid evidence of substantial biodegradation. MW-16B was an injection location in 2013, and MW-16A was an injection location in 2011, although a negligible amount of substrate was injected due to low permeability of the soils. MW-10B is located downgradient, and south of the building.
- Elevated methane concentrations (>20 mg/L) are noted in several wells, indicating an environment conducive to anaerobic biodegradation.

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

5.0 Conclusions and Recommendations

The following conclusions and recommendations were developed following the Fall 2019 groundwater monitoring event:

Conclusions:

CVOC concentrations have steadily declined in the overburden and bedrock groundwater over the past 17 years, with more recent substantial declines related to the 2008, 2009, 2011, and 2013 bioremediation injections.

MW-7A, located in the area of the vegetable oil substrate injections conducted in September 2008, November 2009, November 2011, and September 2013, continued to show decreased levels of CVOCs. Fluctuations in concentrations of CVOC degradation products at MW-5A appear to have a direct relationship with water level fluctuations and are consistent with historical concentrations following substrate injections. Overall, overburden groundwater CVOC concentrations in 2019 were generally consistent with the previous sampling program results.

Bedrock groundwater CVOC concentrations generally showed declines related to the previous substrate injections. Notably, CVOC concentrations decreased substantially in several downgradient bedrock monitoring wells since 2009. TCE was non-detect in all bedrock wells sampled except for a low estimated value in MW-13B (0.19 J µg/L). DCE and VC concentrations at MW-16B decreased substantially from April 2014 to December 2019 resulting in total TCE/DCE/VC/DCA concentrations of 7.7 µg/L. This trend will continue to be monitored.

Groundwater samples for natural attenuation monitoring have been collected since October 2000 and continue to indicate that natural attenuation processes are active. The results for Fall 2019 were generally consistent with previous monitoring events.

Natural anaerobic biodegradation of TCE, which was occurring at the Site prior to 2008, was substantially enhanced by the bioremediation injection program conducted over multiple years.

Recommendations:

At present, CVOCs within the source area and downgradient of that area have decreased as a result of remedial measures including emulsified vegetable oil substrate injections in 2008, 2009, 2011 and 2013. Terra Systems, Inc. (TSI) SRS®-SD was used for all overburden injections, SRS®-FR was used for all bedrock injections, and TSI-DC® bioaugmentation culture was used for microorganism bioaugmentation. Following the Spring 2020 groundwater monitoring event, evaluation of targeted injections to enhance the natural attenuation process will be performed.

6.0 References

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Tables

Table 1
Summary of Groundwater Sampling
Fall 2019 Monitoring Event
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Well ID	Date Sampled	Sample ID	Volume Purged (gallons)
MW-5A	3-Dec-19	MW-5A, FD-120319[3]	2.25
MW-5B	3-Dec-19	MW-5B	5.5
MW-6	4-Dec-19	MW-6	5.5
MW-7A	4-Dec-19	MW-7A, MS, MSD	2.0
MW-7B	3-Dec-19	MW-7B	4.0
MW-10A	4-Dec-19	MW-10A	1.75
MW-10B	4-Dec-19	MW-10B	8.0
MW-12A[2]	NA	NA	NA
MW-12B	5-Dec-19	MW-12B	6.0
MW-13B	3-Dec-19	MW-13B	4.5
MW-14B	5-Dec-19	MW-14B	5.0
MW-15[1]	NA	NA	NA
MW-16A	3-Dec-19	MW-16A	2.75
MW-16B	3-Dec-19	MW-16B	5.5
MW-17A	5-Dec-19	MW-17A	5.0
MW-17B	5-Dec-19	MW-17B	6.0
MW-18A	4-Dec-19	MW-18A	2.5
MW-18B	4-Dec-19	MW-18B, FD-120419[3]	6.0
MW-19B	4-Dec-19	MW-19B	5.5

Note:

1. MW-15 is to be sampled every 5 years in accordance with NYSDEC approval on April 8, 2014, and is to be sampled next in 2023.
2. During the Fall 2019 sampling event, it was discovered that well MW-12A well has been destroyed.
3. FD-120319 is a field duplicate of MW-5A (all parameters except microbial), FD-120419 is a field duplicate of MW-18B (microbial analyses only).

MS - Matrix Spike
MSD - Matrix Spike Duplicate
NA - Not Applicable (see Notes 1 & 2)

Table 2
Water Level Measurements
Fall 2019 Monitoring Event
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Well ID	Elevation Top of Casing	Easting	Northing	11/26/2019	
				Depth to Water	Groundwater Elevation
PMW-1	596.62	1028372.30	1136886.30	7.33	589.29
PMW-2	595.98	1028371.76	1136875.49	6.35	589.63
PMW-3	596.59	1028379.73	1136882.30	6.79	589.80
PMW-4	597.05	1028384.66	1136909.84	7.76	589.29
PMW-5	592.65	1028308.62	1136764.72	2.54	590.11
PMW-6	592.44	1028310.46	1136747.77	4.25	588.19
PMW-7	592.93	1028325.51	1136758.05	4.42	588.51
PMW-8	593.11	1028352.65	1136824.51	4.55	588.56
PMW-9	592.45	1028282.58	1136689.24	3.92	588.53
INJ-1	596.66	1028382.45	1136887.25	7.09	589.57
INJ-2	595.89	1028374.60	1136890.69	7.00	588.89
INJ-3	592.87	1028313.28	1136774.48	4.39	588.48
INJ-4	593.26	1028332.65	1136771.29	2.23	591.03
INJ-5U	596.08	1028365.66	1136878.92	7.30	588.78
INJ-5L	596.00	1028365.66	1136878.92	6.42	589.58
INJ-6U	596.96	1028376.98	1136868.99	6.09	590.87
INJ-6L	595.97	1028376.98	1136868.99	7.15	588.82
INJ-7	592.76	1028409.44	1136837.46	2.46	590.30
INJ-8	592.98	1028418.16	1136832.59	3.18	589.80
INJ-9	591.62	1028023.50	1136898.15	3.29	588.33
INJ-10	591.49	1028032.17	1136890.90	2.67	588.82
MW-1A	597.56	1028606.44	1136554.99	8.35	589.21
MW-1B	597.64	1028611.01	1136554.66	8.46	589.18
MW-2A	595.73	1028335.27	1136881.61	5.58	590.15
MW-2B	595.80	1028337.09	1136888.34	7.19	588.61
MW-3A	599.94	1028627.22	1136895.86	10.49	589.45
MW-3B	599.70	1028624.57	1136899.80	10.62	589.08
MW-4A	591.60	1028027.77	1136890.77	0.6[3]	591.00
MW-4B	591.49	1028023.72	1136890.65	2.99	588.50
MW-5A	597.91	1028256.93	1136567.66	9.5	588.41
MW-5B	597.79	1028256.86	1136562.36	9.19	588.60
MW-6	595.51	1028293.24	1136889.98	6.95	588.56
MW-7A	596.59	1028379.67	1136889.32	6.89	589.70
MW-7B	596.66	1028377.01	1136884.33	7.57	589.09
MW-8	599.63	1028584.29	1136897.91	10.32	589.31
MW-10A	596.87	1028134.19	1136571.96	8.83	588.04
MW-10B	596.71	1028129.79	1136571.87	8.19	588.52
MW-11A	595.48	1027992.43	1136576.28	7.91	587.57
MW-11B	595.57	1027996.44	1136575.71	7.74	587.83

Table 2
Water Level Measurements
Fall 2019 Monitoring Event
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Well ID	Elevation Top of Casing	Easting	Northing	11/26/2019	
				Depth to Water	Groundwater Elevation
MW-12A[1]	590.79	1027887.31	1136654.88	NA	NA
MW-12B	590.89	1027886.62	1136658.22	2.31	588.58
MW-13A	595.18	1028202.92	1136517.75	7.16	588.02
MW-13B	594.73	1028199.59	1136517.64	6.73	588.00
MW-14A	592.97	1027954.11	1136524.76	7.49	585.48
MW-14B	592.85	1027951.17	1136524.55	4.40	588.45
MW-15[2]	591.44	1027851.99	1136475.97	NA	NA
MW-16A	591.64	1028415.02	1136829.41	3.22	588.42
MW-16B	592.38	1028414.66	1136826.44	3.15	589.23
MW-17A	593.13	1028319.92	1136765.00	3.36	589.77
MW-17B	592.92	1028319.47	1136763.41	3.37	589.55
MW-18A	593.78	1028377.39	1136661.13	4.76	589.02
MW-18B	593.43	1028375.07	1136659.79	4.88	588.55
MW-19A	594.95	1028610.90	1136747.48	5.47	589.48
MW-19B	594.65	1028611.64	1136749.89	1.40	593.25

Note:
NA - Not Available.
1. Well MW-12A discovered destroyed during Fall 2019 sampling event.
2. MW-15 is to be sampled every 5 years in accordance with NYSDEC approval on April 8, 2014 and is to be sampled next in 2023. A water level will be obtained at that time.
3. The MW-4A reading was anomalous and not used for groundwater contouring.

Table 3
Groundwater Sampling Field Parameter Results
Fall 2019 Sampling Event
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Monitoring Well ID	Sample Date	Temperature (deg C)	Specific Conductivity (mS/cm)	Dissolved Oxygen + (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Ferrous Iron (mg/L)	Hydrogen Sulfide (mg/L)
MW-5A	12/3/2019	11.9	0.750	3.17	8.04	13.1	1.26	385	20	0.00	0.0
MW-5B	12/3/2019	12.0	1.421	0.47	7.15	0.49	22.7	385	50	0.36	0.0
MW-6	12/4/2019	11.7	1.190	0.22	7.20	-317.3	1.58	385	35	0.03	0.7
MW-7A	12/4/2019	12.0	1.240	0.26	6.78	-152.0	8.89	770	100	1.47	1.0
MW-7B	12/3/2019	11.5	1.490	0.29	7.12	-103.6	1.56	320	20	0.00	2.0
MW-10A	12/4/2019	13.3	1.340	0.58	7.17	-107.2	1.94	300	25	1.05	0.0
MW-10B	12/4/2019	13.0	1.530	0.16	6.84	-86.2	0.36	300	30	0.97	0.1
MW-12A	Well Destroyed										
MW-12B	12/5/2019	11.2	1.222	0.22	7.27	-116.6	1.20	385	25	0.01	0.0
MW-13B	12/3/2019	11.8	2.690	2.42	7.03	58.6	8.68	385	30	0.12	0.0
MW-14B	12/5/2019	11.9	3.090	1.43	7.24	-45.9	5.14	180	10	0.64	0.0
MW-16A	12/3/2019	12.2	1.586	6.26	7.24	48.6	1.09	770	70	0.15	0.0
MW-16B	12/3/2019	12.0	1.351	0.17	7.09	-322.0	11.22	770	35	0.08	2.0
MW-17A	12/5/2019	13.3	0.970	0.23	7.58	-166.4	0.16	440	20	0.55	0.0
MW-17B	12/5/2019	12.6	1.375	0.15	6.52	-311.5	15.4	770	45	1.35	5.0
MW-18A	12/4/2019	13.4	0.894	0.84	7.25	-122.2	3.43	340	30	0.85	0.0
MW-18B	12/4/2019	12.9	1.091	0.16	6.64	-355.7	3.28	400	60	0.36	5.0
MW-19B	12/4/2019	13.0	1.13	0.28	6.93	-135.6	2.02	320	25	0.14	0.7

Notes:

- Not Measured
  Some CO2 samples were unable to be analyzed. CO2 will be collected during the next sampling event.
+ Elevated dissolved oxygen readings in some cases conflict with negative oxidation/reduction potential readings.
mS/cm - milliSiemen per centimeter
mg/L - milligram per liter
mV - millivolt
NTU - nephelometric turbidity unit
ORP - oxidation-reduction potential

Table 4
Summary of Analytical Specifications
Fall 2019 Monitoring Event
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Sample Type	Container Type	Sample Volume	Preservation Method	Max. Holding Time	Analytical Method
Constituents of Concern					
Select VOCs	40 mL glass vial with septum top	3x40 mL	Hydrochloric acid, Cool 4◦C	14 days	SW846 Method 8260C
Natural Attenuation Parameters					
Methane, Ethene, Ethane, Propane,	40 mL glass vial with septum top	3x40 mL	Hydrochloric acid, Cool 4◦C	14 days	USEPA RSK175
TOC	40 mL glass vial with septum top	2x40 mL	Sulfuric acid, Cool 4˚C	28 days	USEPA 5310C
BOD	1000 mL plastic	1000 mL	None, Cool 4◦C	48 hours	USEPA 5120B
COD	250 mL plastic	250 mL	Sulfuric Acid,Cool 4◦C	28 days	USEPA 410.4
Dissolved Iron	500 mL plastic	500 mL	Nitric Acid, Cool 4◦C	6 months	USEPA 6010C
Chloride, Sulfate; Nitrate, Nitrite	500 mL plastic	500 mL	None, Cool 4◦C	28 days; 48 hours	USEPA 300.0; USEPA 353.2
Sulfide	500 mL plastic	500 mL	Sodium hydroxide and zinc acetate, Cool 4◦C	7 days	Standard Method (SM) 4500-S2
Microbial Population	1000 mL plastic	1000 mL	None, Cool 4◦C	24-48 hours	CENSUS (DHC, DHB, & DHC functional genes)

Notes:

VOC - volatile organic compound
TOC - total organic carbon
BOD - biological oxygen demand
COD - chemical oxygen demand
mL - milliliter

Table 5
Sample Matrix
Fall 2019 Monitoring Event
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Location	Unit	VOCs[A/] (SW8260C)	Methane, Ethane, Ethene (RSKSOP-175mod)[B/]	Propane (RSKSOP-175mod) [B/]	Chloride, Sulfate (300.0)	Total Organic Carbon (5310C)	BOD (5120B), COD (410.4)	Dissolved Iron (6010C)	Nitrate (353.2), Nitrite (353.2)	Sulfide (SM 4500-S2)	Well Head Analysis [C/]	Field Analyses (Hach kits) [D/]	Microbial Analyses [E/]
Existing Site Investigation Monitoring Wells													
MW-5A	overburden	1	1	1	1	1	1	1	1	1	1	1	
MW-5B	bedrock	1	1	1	1	1	1	1	1	1	1	1	
MW-6	bedrock	1									1	1	1
MW-7A	overburden	1	1	1	1	1	1	1	1	1	1	1	1
MW-7B	bedrock	1	1	1	1	1	1	1	1	1	1	1	
MW-10A	overburden	1	1	1	1	1	1	1	1	1	1	1	1
MW-10B	bedrock	1	1	1	1	1	1	1	1	1	1	1	1
MW-12A	overburden	Well Destroyed											
MW-12B	bedrock	1	1	1	1	1	1	1	1	1	1	1	
MW-13B	bedrock	1									1	1	
MW-14B	bedrock	1									1	1	
MW-15	bedrock												
MW-16A	overburden	1	1	1	1	1	1	1	1	1	1	1	
MW-16B	bedrock	1	1	1	1	1	1	1	1	1	1	1	
MW-17A	overburden	1	1	1	1	1	1	1	1	1	1	1	
MW-17B	bedrock	1	1	1	1	1	1	1	1	1	1	1	
MW-18A	overburden	1	1	1	1	1	1	1	1	1	1	1	1
MW-18B	bedrock	1	1	1	1	1	1	1	1	1	1	1	1
MW-19B	bedrock	1									1	1	

QA/QC

Matrix spike/matrix spike duplicate pairs and field duplicates were collected at a rate of 5%.

Name field duplicates blind, using a similar scheme but non-existent well, such as MW-190B or MW-60.

Notes:

* -MW-15 to be sampled every 5 years as approved by DEC in April 2014. Next sample event is in 2023.

Requires permit from the Department of Transportation (DOT), Niagara County Residency (716) 438-2396.

[A/] VOCs (volatile organic compounds): tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2- dichloroethene, 1,1-dichloroethene, 1,1-dichloroethane, 1-1-1-,trichloroethane, vinyl chloride, and chloroethane.

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

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

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

[E/] Microbial CENSUS analyses include: DHC, DHC functional genes (bvc, tce, vcr), and DHBt

BOD - biological oxygen demand

COD - chemical oxygen demand

Table 6
Monitoring Well Groundwater Analytical Result Summary - Fall 2019
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Parameter	Criteria[1]	MW- 5A	MW- 5B	MW- 6	MW- 7A	MW- 7B	MW-10A	MW-10B	MW-12B	MW-13B
Valatile Organic Compounds										
PCE (µg/L)	5	1.0 U	2.0 U	1.0 U	2.5 U	1.0 U	25 U	20 U	2.5 U	1.0 U
TCE (µg/L)	5	0.47 J	2.0 U	1.0 U	2.5 U	1.0 U	5 J	20 U	2.5 U	0.19 J
Cis-1,2-DCE (µg/L)	5	9.5	32	10	21 J	1.3	500	420	65	16
Trans-1,2-DCE (µg/L)	5	1.0 U	2.0 U	1.0 U	2.5 U	1.0 U	25 U	4 J	2.5 U	1.0 U
1,1-DCE (µg/L)	5	1.0 U	2.0 U	1.0 U	2.5 U	1.0 U	25 U	20 U	2.5 U	1.0 U
Vinyl Chloride (µg/L)	2	11	90	78	35 J	10	130	180	94	21
1,1,1-Trichloroethane (µg/L)	5	1.0 U	2.0 U	1.0 U	2.5 U	1.0 U	25 U	20 U	2.5 U	1.0 U
1,1-Dichloroethane (µg/L)	5	1.0 U	2.0 U	1.0 U	69	1.0 U	25 U	20 U	2.5 U	0.17 J
Chloroethane (µg/L)	5	1.0 U	2.0 U	1.0 U	44	1.0 U	25 U	20 U	2.5 U	1.0 U
Dissolved Metals										
Dissolved Iron (mg/L)	--	0.20 U	0.41	NA	1.5	0.20 U	1.1	0.68	0.20 U	NA
Dissolved Gases										
Ethane (µg/L)	--	2.1	0.66 J	NA	95	0.58 J	2.4	1.8	0.89 J	NA
Ethene (µg/L)	--	3.7	4.8	NA	25	3.3	36	27	5.3	NA
Methane (µg/L)	--	140	270	NA	13,000 D	290	2,000	1,500	210	NA
Propane (µg/L)	--	1.0 U	0.69 J	NA	1.0 U	1.0 U	1.0 U	4.1	1.2	NA
Miscellaneous Parameters										
TOC (mg/L)	--	0.68 J	3.3	NA	17	3.3	1.4	3	2.8	NA
Sulfate (mg/L)	250	97	240	NA	70	190	150	260	240	NA
Sulfide (mg/L)	0.05	1.0 U	1.1	NA	1.0 U	7.1	1.0 U	1.0 U	1.0 U	NA
BOD (mg/L)	--	2.0 U	2.0 U	NA	14 J-	2.0 U	2.0 UJ	2.0 U	2.0 U	NA
COD (mg/L)	--	4.1 J	9.4 J	NA	42	12	4.2 J	10 U	10 U	NA
Chloride (mg/L)	250	89	110	NA	12	180	200	220	150	NA
Nitrate (mg/L)	10	0.59	0.25 U	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA
Nitrite (mg/L)[2]	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Microbial CENSUS										
DHC (cells/mL)	--	NA	NA	2.13E+01	2.30E+03	NA	2.50E+00	3.87E+01	NA	NA
BVC (cells/mL)	--	NA	NA	5.00E-01 U	2.41E+02	NA	5.00E-01 U	4.50E+00	NA	NA
TCE (cells/mL)	--	NA	NA	5.00E-01 U	2.03E+02	NA	1.40E+00	5.73E+02	NA	NA
VCR (cells/mL)	--	NA	NA	7.70E+00	9.46E+02	NA	5.00E-01 U	4.75E+01	NA	NA
DHBt (cells/mL)	--	NA	NA	4.90E+00 U	2.17E+01 U	NA	5.00E+00 U	5.30E+00 U	NA	NA

See Page 2 of 2 for notes.

Table 6
Monitoring Well Groundwater Analytical Result Summary - Fall 2019
Former Carborundum Company, Hyde Park Facility
Niagara, New York

Parameter	Criteria[1]	MW-14B	MW-16A	MW-16B	MW-17A	MW-17B	MW-18A	MW-18B	MW-19B	MW-5A (Duplicate)	MW-18B (Duplicate)
Valatile Organic Compounds											
PCE (µg/L)	5	1.0 U	4.0 U	1.0 U	2.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	NA
TCE (µg/L)	5	1.0 U	0.6 J	1.0 U	2.0 U	1.0 U	32	2.0 U	1.0 U	0.40 J	NA
Cis-1,2-DCE (µg/L)	5	0.37 J	3.6 J	1	50	11	43	56	1.4	10	NA
Trans-1,2-DCE (µg/L)	5	1.0 U	4.0 U	1.0 U	2.0 U	0.28 J	0.66 J	2.0 U	1.0 U	1.0 U	NA
1,1-DCE (µg/L)	5	1.0 U	4.0 U	1.0 U	2.0 U	1.0 U	0.93 J	2.0 U	1.0 U	1.0 U	NA
Vinyl Chloride (µg/L)	2	0.7 J	120	6.7	83	14	0.97 J	70	1.2	13	NA
1,1,1-Trichloroethane (µg/L)	5	1.0 U	4.0 U	1.0 U	2.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	NA
1,1-Dichloroethane (µg/L)	5	0.19 J	4.0 U	1.0 U	13	4.3	3.6	2.0 U	1.0 U	0.17 J	NA
Chloroethane (µg/L)	5	1.0 U	4.0 U	1.0 U	2.0 U	6.6	2.0 U	2.0 U	1.0 U	1.0 U	NA
Dissolved Metals											
Dissolved Iron (mg/L)	--	NA	0.20 U	0.20 U	0.55	3.1	0.9	0.35	NA	0.20 U	NA
Dissolved Gases											
Ethane (µg/L)	--	NA	1	4.2	11	24	0.36 J	2.3	NA	2.4	NA
Ethene (µg/L)	--	NA	49	17	17	17	1.0 U	9.9	NA	4.3	NA
Methane (µg/L)	--	NA	77	9,300 D	9,400 D	27,000 D	9.2	24,000 D	NA	160	NA
Propane (µg/L)	--	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	NA
Miscellaneous Parameters											
TOC (mg/L)	--	NA	6.1	4	2.8	5.9	1.3	8.8	NA	0.64 J	NA
Sulfate (mg/L)	250	NA	810	220	67	67	130	130	NA	98	NA
Sulfide (mg/L)	0.05	NA	1.0 U	9.5	1.0 U	2.3	1.0 U	13	NA	1.1	NA
BOD (mg/L)	--	NA	2.0 U	14	4.2	9.7 J-	2.0 U	35 J-	NA	2.0 U	NA
COD (mg/L)	--	NA	18	25	10 U	19	10 U	49	NA	10 U	NA
Chloride (mg/L)	250	NA	170	110	57	140	67	96	NA	89	NA
Nitrate (mg/L)	10	NA	0.50 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA	0.59	NA
Nitrite (mg/L)[2]	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Microbial CENSUS											
DHC (cells/mL)	--	NA	NA	NA	NA	NA	1.30E+00	2.72E+02	NA	NA	1.59E+02
BVC (cells/mL)	--	NA	NA	NA	NA	NA	5.00E-01 U	6.00E-01 J	NA	NA	5.00E-01 J
tceA (cells/mL)	--	NA	NA	NA	NA	NA	5.00E-01 U	4.90E+00	NA	NA	3.10E+00
VCR (cells/mL)	--	NA	NA	NA	NA	NA	5.00E-01 U	1.15E+02	NA	NA	7.19E+01
DHBt (cells/mL)	--	NA	NA	NA	NA	NA	4.90E+00 U	8.80E+00 U	NA	NA	7.50E+00 U

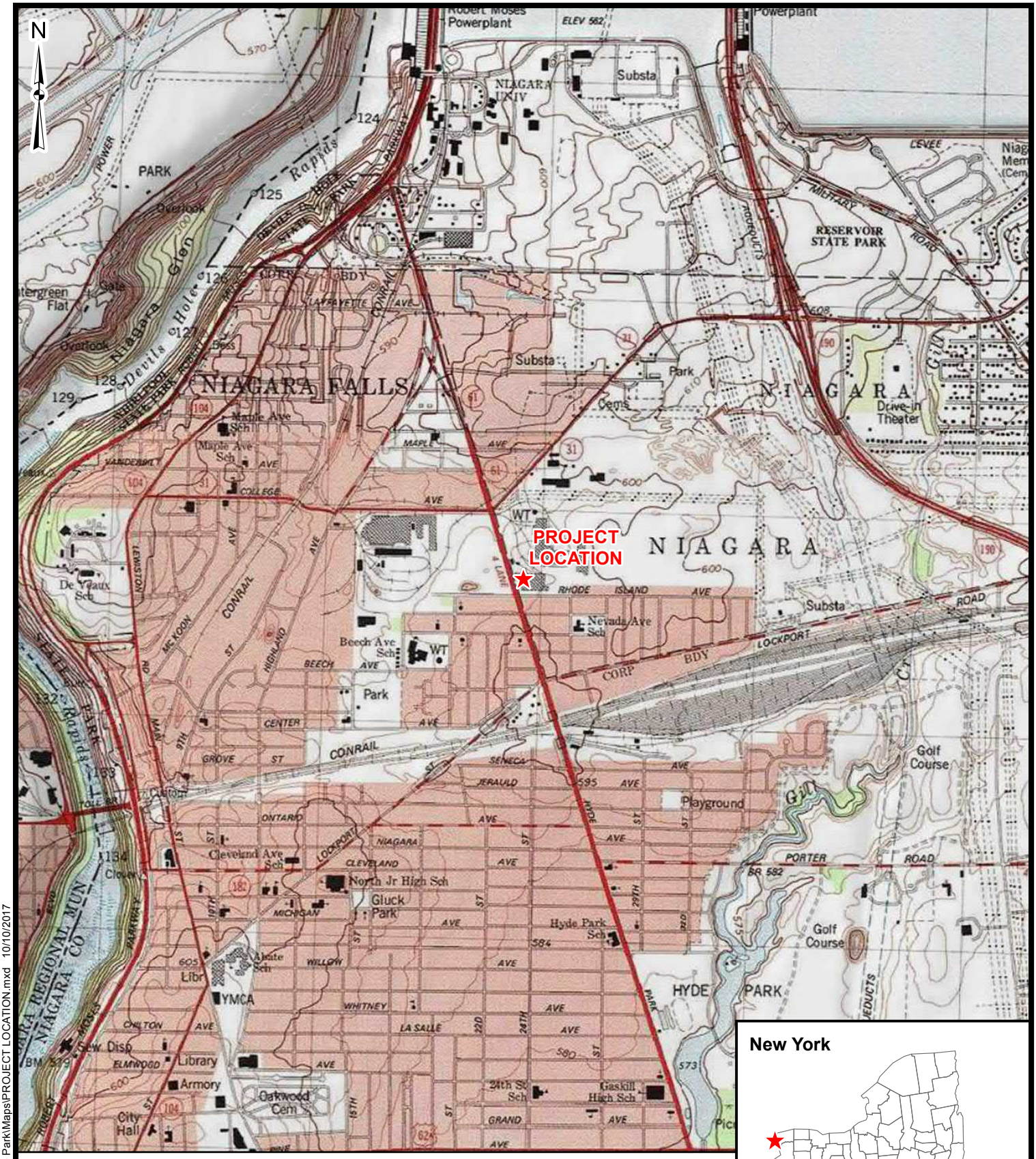
Notes:
1. NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, April 2000, Glass GA.
2. In Fall 2019, the nitrite was not processed due to 48hr hold times and a miscommunication with the laboratory.
3. Bold concentrations exceed criteria.

J = The reported concentration is an estimated value.
J- = The reported concentration is an estmated value biased low.
D = Result reported from a secondary dilution analysis.
U = Not detected above the reporting limit.
UJ = Not detected. The reporting limit is an estimated value.
NA - Not Analyzed

µg/L - micrograms per liter
mg/L - milligrams per liter
PCE - tetrachlorethene
TCE- trichloroethene
DCE - dichloroethene
TOC - total organic carbon

BOD - biological oxygen demand
COD - chemical oxygen demand
DHC - Dehalococcoids
BVC - BAV1 vinyl chloride reductase
VCR - vinyl chloride reductase
DHBt - Dehalobacter species
tceA - tceA reductase

Figures



Source: USA Topo Maps, ESRI Map Service;
1:24,000-scale USGS Topographic Map,
Lewiston, 1996
Niagara Falls, 1996

2,000 0 2,000 Feet

AECOM

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NEW YORK
PROJECT LOCATION PLAN

FIGURE 1

J:\Projects\60481767_BPIP\MISC\GIS\Hyde Park\Maps\PROJECT LOCATION.mxd 10/10/2017

J:\Projects\60481767_BPIPO\MtSC\GIS\Hyde Park\Maps\SITE PLAN.mxd 10/26/2017

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NEW YORK
SITE PLAN

AECOM

FIGURE 2

Legend

- Injection Well
- Monitoring Well
- Performance Monitoring Well
- Groundwater Flow Direction
- Fence Line
- Groundwater Elevation Contour

Source: ESRI World Imagery

Note: MW-4A was not used in generation of groundwater contours due to anomalous reading.

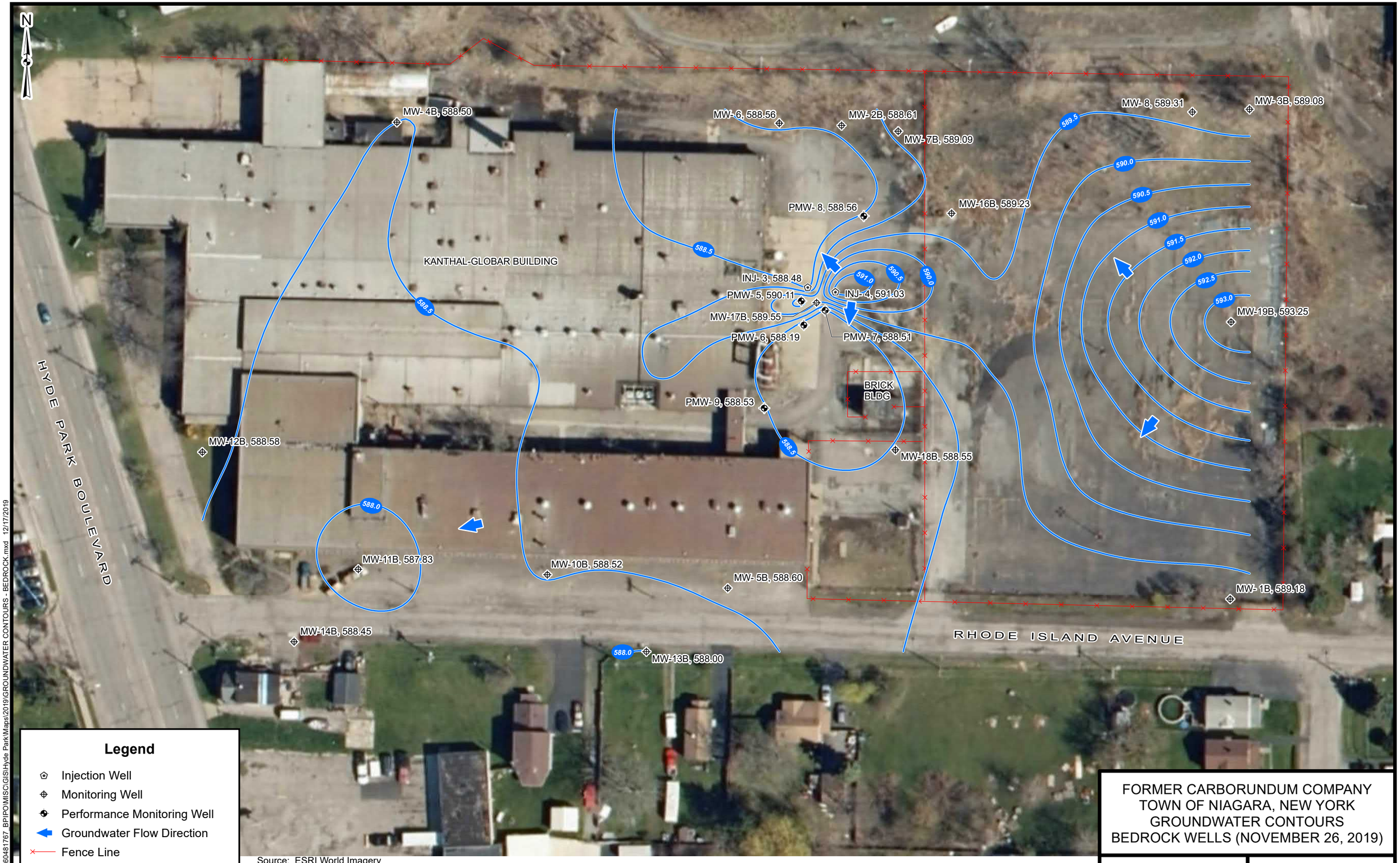
60 0 60 Feet

FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NEW YORK
GROUNDWATER CONTOURS
OVERBURDEN WELLS (NOVEMBER 26, 2019)

AECOM

FIGURE 3

J:\Projects\60481767_BPIPOMISC\GIS\Hyde Park\Maps\2019\GROUNDWATER CONTOURS - OVERBURDEN.mxd 12/6/2019


N
MW- 4B, 588.50
MW- 6, 588.56
MW- 2B, 588.61
MW- 7B, 589.09
MW- 8, 589.31
MW- 3B, 589.08
PMW- 8, 588.56
MW-16B, 589.23
KANTHAL-GLOBAR BUILDING
INJ- 3, 588.48
INJ- 4, 591.03
PMW- 5, 590.11
MW-17B, 589.55
PMW- 6, 588.19
PMW- 7, 588.51
MW-19B, 593.25
BRICK BLDG
PMW- 9, 588.53
MW-12B, 588.58
MW-18B, 588.55
HYDE PARK BOULEVARD
MW-11B, 587.83
MW-10B, 588.52
MW- 5B, 588.60
MW- 1B, 589.18
MW-14B, 588.45
RHODE ISLAND AVENUE
MW-13B, 588.00
588.0
588.5
589.5
590.0
590.5
591.0
591.5
592.0
592.5
593.0
Legend
Injection Well
Monitoring Well
Performance Monitoring Well
Groundwater Flow Direction
Fence Line
Groundwater Elevation Contour
Source: ESRI World Imagery
60
0
60 Feet
FORMER CARBORUNDUM COMPANY
TOWN OF NIAGARA, NEW YORK
GROUNDWATER CONTOURS
BEDROCK WELLS (NOVEMBER 26, 2019)
AECOM
FIGURE 4
J:\Projects\60481767_BPIPO\MISC\GIS\Hyde Park\Maps\2019\GROUNDWATER CONTOURS - BEDROCK.mxd 12/17/2019

MW-7A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	1200	1.8 J	1 U	1 U	1.2 J	1 U	0.5 U	0.5 U	0.5 U	0.66 U	1.7 U	2.5 U
DCE	4800	210	65	20	3.8 J	3.9 J	3	1.5	1.9	26	46	21 J
VC	220	150	50	19	1 U	2.2 J	1	3.1	3.7	33	42	35 J
DCA	1000	49	33	22	9.1	15	12	11	12	61 J	140	69

MW-4A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	2.8 J	130	94	160	7.5	4.2 J	1.2	1.2	3.4	1.3	0.44 J	NS
DCE	74	115.7	254.9	150	140	31	3.7	1.3	2.8	0.68 J	1.1	NS
VC	45	41	45	73	20	11	4.1	1.1	1.1	2.6	0.96 J	NS
DCA	4.6 J	17	21	18	5.4	1.3 J	0.5 U	1	1.4	1.4	1.8	NS

MW-2A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	1.2 J	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	2 U	1.3 J	1.2 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	13 J	26	18	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-3A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	0.43 J	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	1.5 J	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	2 U	2 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-16A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	NS	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	3.3 U	0.33 U	0.6 J
DCE	NS	8.2	10	11	8.4	8.5	5.9	9.1	6.5	7.3 J	1.4	3.6 J
VC	NS	75	180	340	110	300	140	250	18	190	33	120
DCA	NS	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	2.5 U	0.25 U	4.0 U

MW-17A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	115	22	15	11	5.3	3.1 J	0.62 J	0.5 U	0.5 U	1.7 U	1.7 U	2.0 U
DCE	230	180	210	160	140	180	150	160	110	120	59	50
VC	18	25	27	30	25	45	49	86	89	120	91	83
DCA	59	30	20	26	21	22	16	18	15	17	11	13

MW-19A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	1.7 J	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	33	3.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	2 U	2.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-12A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	2.6 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	NS
DCE	540	64	16	19	19	22	8.9	1.6	9.5	21	16	NS
VC	49	38	16	16	13	14	6.8	9.6	8.8	13	9.2	NS
DCA	5.9	2.7	1.6 J	1.8 J	1.8 J	1.9 J	0.89 J	0.7 J	1.1	1.6	0.91 J	NS

MW-18A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	36	25	25	23	21	25	27	38	37	29	36	32
DCE	47	43	51	42	56	58	43	53	51	58	42	43
VC	4.4	7	2.6 J	8.4	2.4 J	3.4 J	0.86 J	2.3	0.62 J	1.8 J	1.1	0.97 J
DCA	5.6	4.7 J	4.2 J	4.7 J	4.2 J	4.9 J	3.6	4.7	4.3	5.0	3.7	3.6

MW-10A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.57 J	6.6 U	6.6 U	5J
DCE	1200	409.4	397.6	630	620	580	560	710	960 D	590	540	500
VC	86	140	140	250	170	130	95	130	83	130	94	130
DCA	25	6.4	5.7	7.7	7	5.6	4.4	5.3	5.4	5.0 UJ	5.0 U	25 U

MW-5A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	1.3 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.66 U	4.1 U	0.47 J
DCE	320	5.9	110.97	5.7	88	110	240	150	340 D	61	250	9.5
VC	42	1.8	84	3.3 J	82	190	300	140	340 D	68	310	11
DCA	2.1 J	5 U	1 U	1 U	1 U	1.3 U	3.3	1.4	4.2	0.88 J	3.3 J	1.0 U

MW-11A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	1.3 J	5 U	1.9 J	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	2 U	2 U	3.2 J	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5 U	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-1A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	2.4 J	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	0.44 J	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5 UJ	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-13A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	2 U	2 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-14A	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	1.6 J	1.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	0.37 J	2.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Legend

- ð Monitoring Well
- Fence Line

LOCATION ID — DATE

	MW-1A	2000
TRICHLOROETHENE	TCE	5 U
CIS 1,2-DICHLOROETHENE	DCE	2.4 J
VINYL CHLORIDE	VC	0.44 J
1,1 DICHLOROETHANE	DCA	5 UJ

RESULT

Notes:
1. Units are shown in µg/L
2. NS = Not Sampled
3. D = Result reported from a secondary dilution analysis.
4. J = The reported concentration is an estimated value.
5. U = Not detected above the reported method detection limit.
6. UJ = Not detected. The reported method detection limit is an estimated value.

Source:
ESRI World Imagery

60 0 60 Feet

FORMER CARBORUNDUM COMPANY TOWN OF NIAGARA, NEW YORK VOC CONCENTRATIONS IN OVERBURDEN GROUNDWATER (2000 - 2019)

AECOM

FIGURE 5

\\rs\buffalo.us.ie.urs\buffalo\Projects\60483767_BPIPO\MISC\GIS\Hyde Park\Maps\2019\GROUNDWATER VOC - OVERBURDEN.mxd 2/7/2020

MW-6	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	1.7 U	0.33 U	1.0 U
DCE	560	85	39	33	30	24	18	20	18	16	12	10
VC	91	69	48	57	47	42	39	57	59	79	48	78
DCA	0.28 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	1.3 U	0.25 U	1.0 U

MW-7B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-17	Dec-19
TCE	5 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	1.0 U
DCE	84	7.3	4.5 J	6	1.6 J	1.2 J	0.5 U	1.2	0.82 J	2.2	2.2	1.3
VC	39	24	31	25	9.2	75	5.5	6.1	10	18	17	10
DCA	5 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.25 U	0.25 U	1.0 U

MW-3B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	4.8 J	1.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	2.3	2.9	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	5	5 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-4B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	3.2 J	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	39	9.7	2.8	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	35	9.5	12	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	3.2 J	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-2B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	0.44 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	NS
DCE	260	9.1	3.7 J	1.8 J	2.7 J	2.3 J	1	0.87 J	0.95 J	0.77 J	1.3	NS
VC	92	16	7.6 J	2.6 J	8.6	4 J	2.2	3.4	2.2	1.8	2.6	NS
DCA	5 UJ	5 U	1 U	1 U	1 U	1 U	0.92 J	0.65 J	0.96 J	0.50 J	0.25 U	NS

MW-8	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	NS
DCE	5.55	2.1	2.3	1.9 J	1.6 J	1.7 J	1.6	1.7	1.9	1.7	1.9	NS
VC	1.9 J	2.6	2.2	2.1 J	1.1 J	1.8 J	1.5	1.9	1.8	1.4	1.6	NS
DCA	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.25 U	0.25 U	NS

MW-16B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	0.97 J	5 U	1 U	1 U	74	2.2 J	2.5 U	4.8	0.5 U	0.33 U	0.33 U	1.0 U
DCE	130	511.8	81	27	4700	600	2300	1100	0.5 U	0.30 U	0.63 J	1
VC	35	130	48	43	600	610	2000	780	4.3	2.6	4.6	6.7
DCA	5 U	5 U	1 U	1 U	4 J	1 J	3.4 J	6.6	2	0.39 J	0.25 U	1.0 U

MW-17B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	22	3.1 J	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.68 J	0.33 U	1.0 U
DCE	1000	280	8.5	19	20	35	1.3	0.5 U	0.5 U	10	4.9	11
VC	69	69	9.6	27	18	40	2.1	0.8 J	0.88 J	12	7.9	14
DCA	5.4	26	45	48	43	38	8.2	1.5	1.7	6.3 J	4.5	4.3

MW-19B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	2.4 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	1.0 U
DCE	41	68	2.1	8.7	2.3 J	2.1 J	2.9	1.8	1.1	1.6	24	1.4
VC	6.3	7.2	2.1 J	3.3 J	1.6 J	1.2 J	0.65 J	1	1.1	1.5	5.0	1.2
DCA	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.25 UJ	0.25 U	1.0 U

MW-12B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.66 U	0.83 U	2.5U
DCE	210	2.6	11	0.98 J	5.6	43	57	13	73	52	62	65
VC	77	2 U	1 U	1 U	10	73	75	9.1	59	110	73	94
DCA	2.3 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.66 J	0.63 U	2.5U

MW-18B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	7.7	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	6.6 U	0.83 U	2.0 U
DCE	690	62	69	150	110	120	43	35	90	380	69	56
VC	90	220	190	220	140	190	71	40	120	210	92	70
DCA	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	5.0 UJ	0.63 U	2.0 U

MW-10B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	68	1 U	1 U	2 U	1 U	1 U	0.5 U	0.5 U	0.5 U	3.3 U	2.6 U	20 U
DCE	1800	370	220	960	280	230	190	190	220	360	210	420
VC	95	150	83	180	110	120	22	190	6.1	270	12	180
DCA	1.2 J	1 U	1 U	2 U	1 U	1 U	0.5 U	0.9 J	0.59 J	2.5 UJ	2.0 U	20 U

MW-5B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	2.6 J	5 U	1.1 J	1 U	1 U	1 U	0.97 J	0.58 J	0.5 U	1.7 U	0.33 U	2.0 U
DCE	420	39	36	48	33	32	19	34	32	36	32	32
VC	45	37	39	63	34	44	33	63	71	91	78	90
DCA	1.1 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	1.3 U	0.30 J	2.0 U

MW-11B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	NS
DCE	590	56	1.9 J	2.2 J	1 U	0.8 U	0.5 U	0.56 J	0.54 J	1.1	0.65 J	NS
VC	81	48	7.4	4.6 J	6.1	1.4 J	1.2	1.7	9.7	6.5	1.9	NS
DCA	3.5 J	1 U	1.3 J	1.8 J	1.4 J	1.9 J	2	1	1.7	0.95 J	1.9	NS

MW-14B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	1.0 U
DCE	300	64	16	4.1 J	1.5 J	0.8 U	0.67 J	0.95 J	0.94 J	0.92 J	0.72 J	0.37 J
VC	110	86	33	5.4	5.4	1.5 J	1.2	1.5	1.2	2.9	1.3	0.7 J
DCA	0.61 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.53 J	0.5 U	0.43 J	0.34 J	0.19 J

MW-1B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCE	4.7 J	0.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
VC	3.8	1.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DCA	1.5 J	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MW-15	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	5 U	5 U	1 U	1 U	1 U	1 U	NS	NS	NS	NS	0.10 UJ	NS
DCE	400	57.1	5.9	32	0.8 U	0.8 U	NS	NS	NS	NS	5.2	NS
VC	120	82	17	52	1.8 J	2 J	NS	NS	NS	NS	16	NS
DCA	0.95 J	2	1.3 J	1.4 J	1.2 J	1 U	NS	NS	NS	NS	1.1	NS

MW-13B	2000	Oct-09	May-10	Oct-11	Jun-12	Aug-13	Apr-14	Nov-15	Apr-16	Sep-17	Apr-18	Dec-19
TCE	12	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.33 U	0.33 U	0.19 J
DCE	310	88	46	17	27	8.6	19	18	9.9	22	7.8	16
VC	40	68	47	24	57	48	15	21	12	38	9.7	21
DCA	0.91 J	5 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.25 UJ	0.25 U	0.17 J

Legend

- ð Monitoring Well
- Fence Line

LOCATION ID — DATE

MW-1B	2000
TCE	5 U
DCE	4.7 J
VC	3.8
DCA	1.5 J

TRICHLOROETHENE
CIS 1,2-DICHLOROETHENE
VINYL CHLORIDE
1,1 DICHLOROETHANE
RESULT

Notes:
1. Units are shown in µg/L
2. NS = Not Sampled
3. D = Result reported from a secondary dilution analysis.
4. J = The reported concentration is an estimated value.
5. U = Not detected above the reported method detection limit.
6. UJ = Not detected. The reported method detection limit is an estimated value.

Source:
ESRI World Imagery

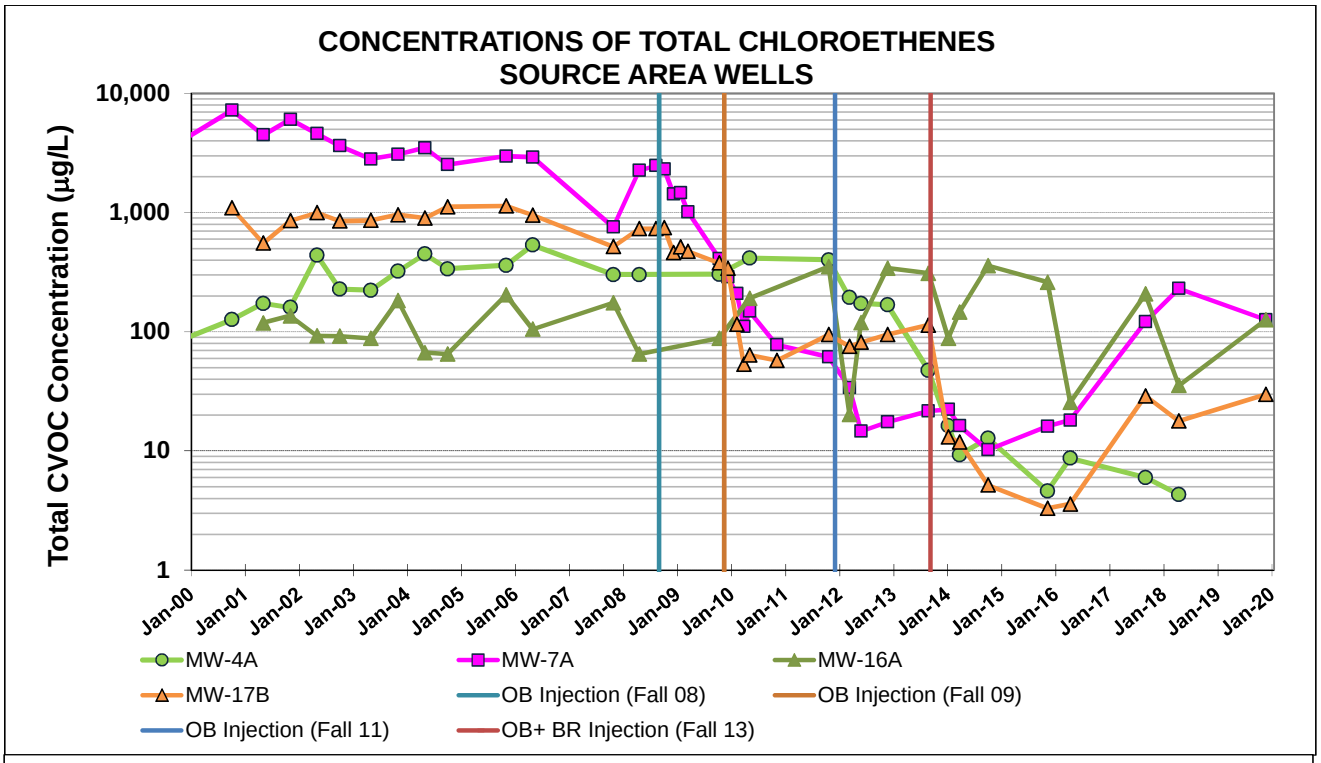
60 0 60 Feet

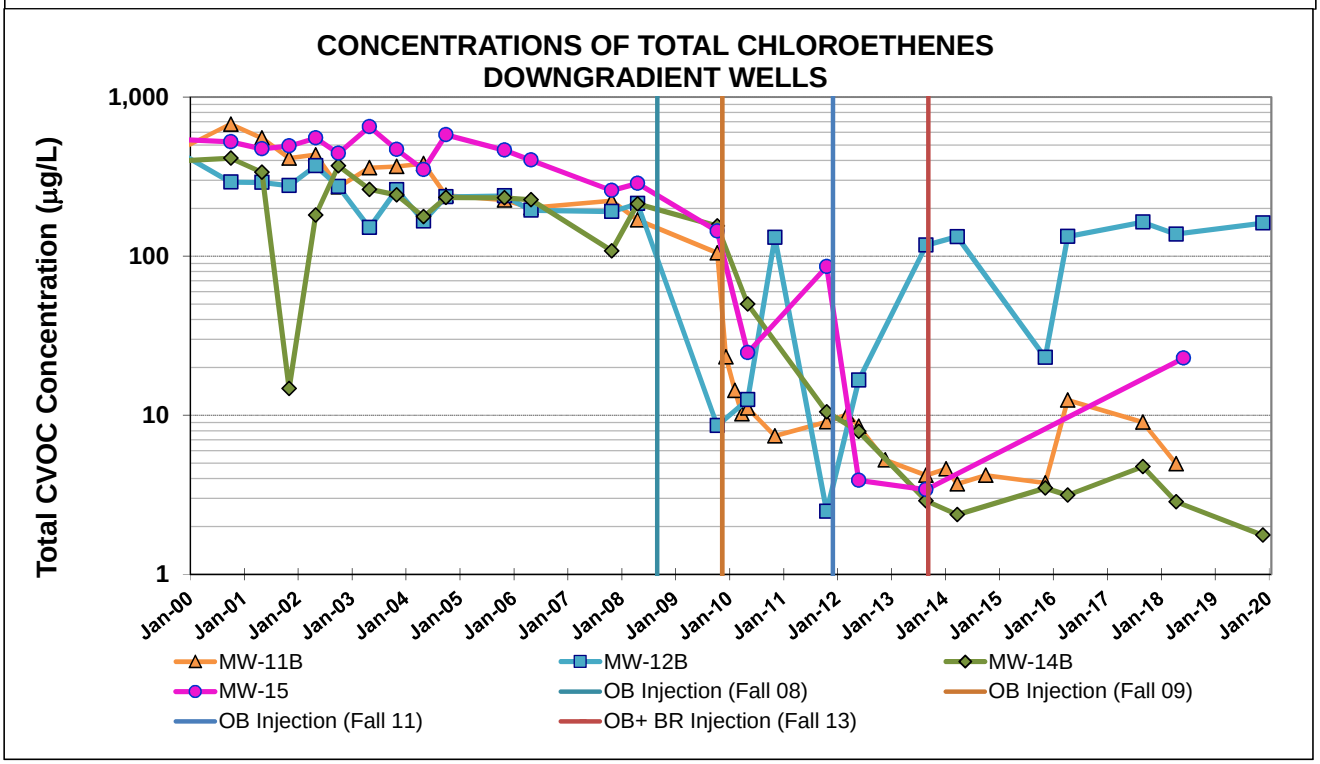
FORMER CARBORUNDUM COMPANY TOWN OF NIAGARA, NEW YORK VOC CONCENTRATIONS IN BEDROCK GROUNDWATER (2000 - 2019)

AECOM

FIGURE 6

\\URSBuffalo.us.ie.urs\Buffalo\Projects\60481767_BPIPOWMISC\GIS\Hyde Park\Maps\2019\GROUNDWATER VOC - BEDROCK.mxd 2/6/2020





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

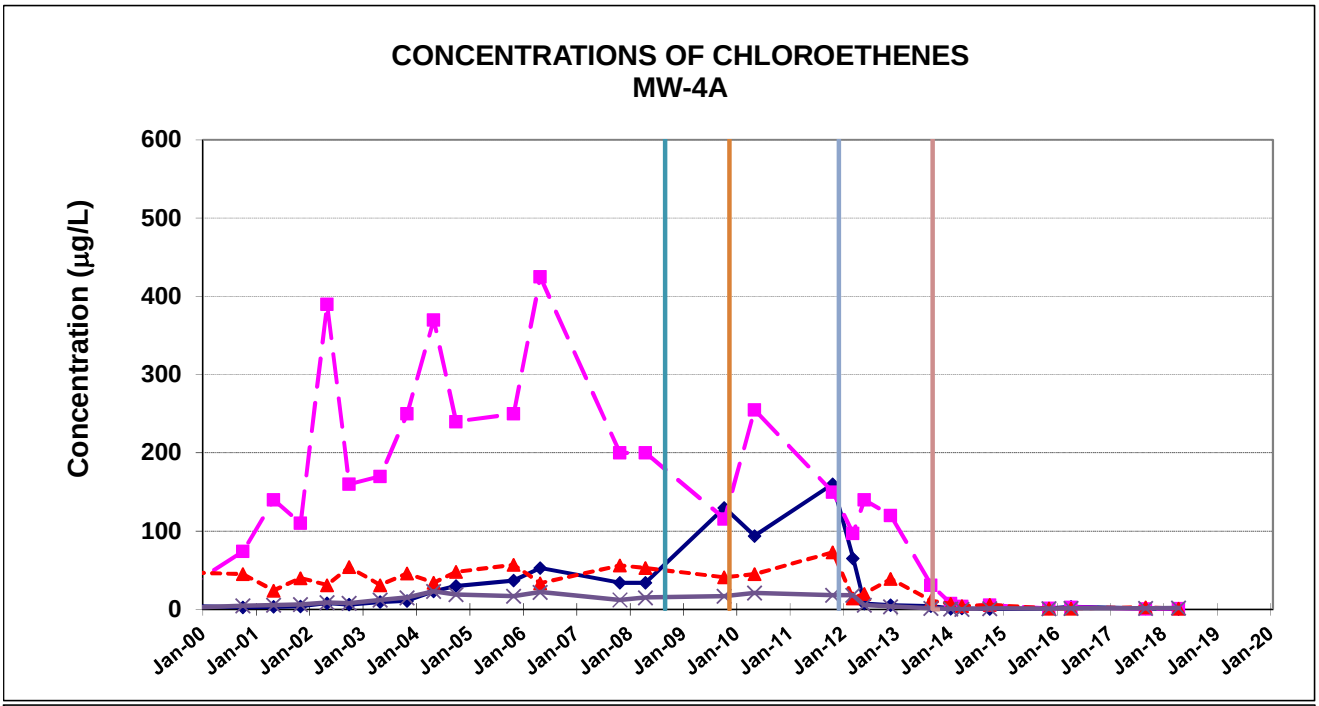
FIGURE 7

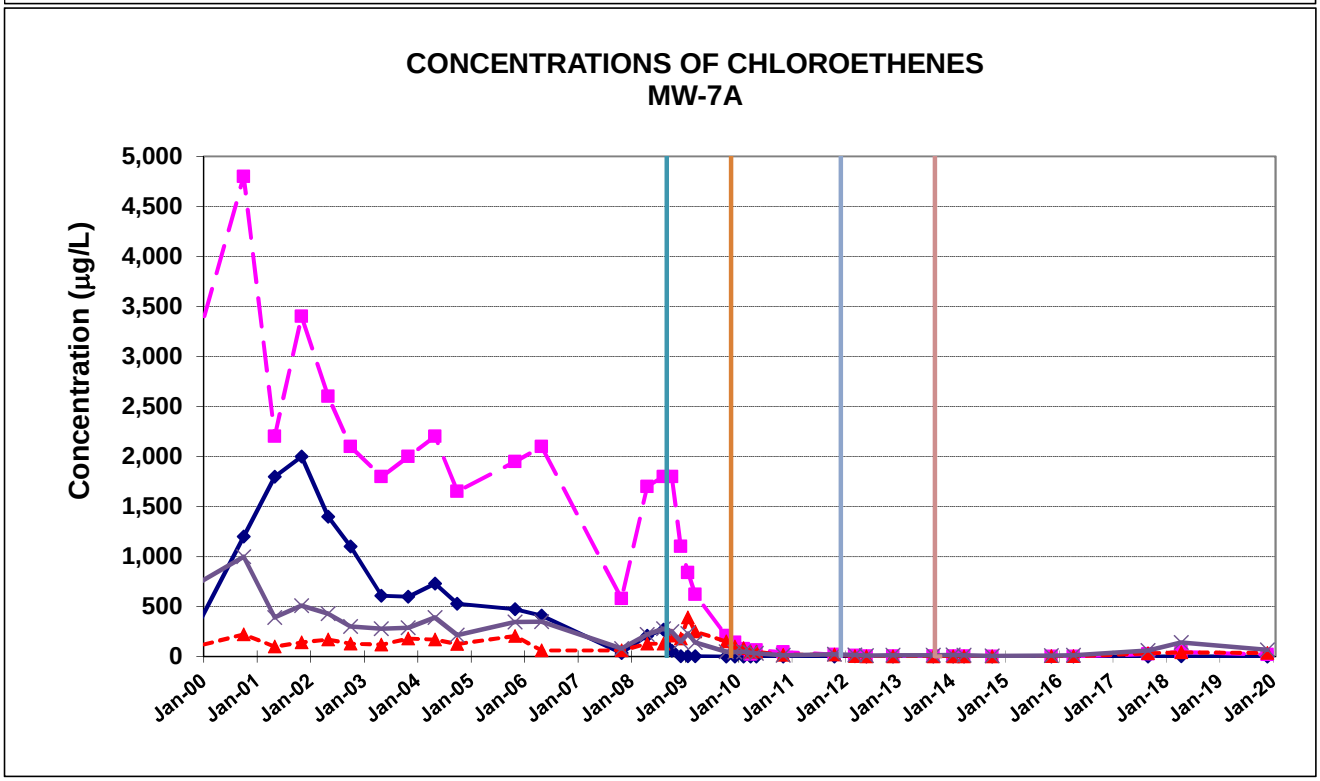
FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202





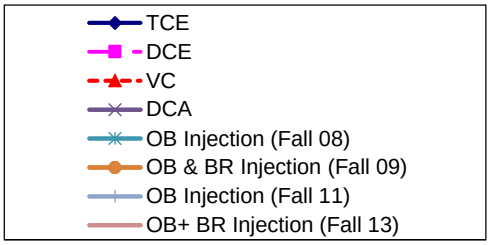


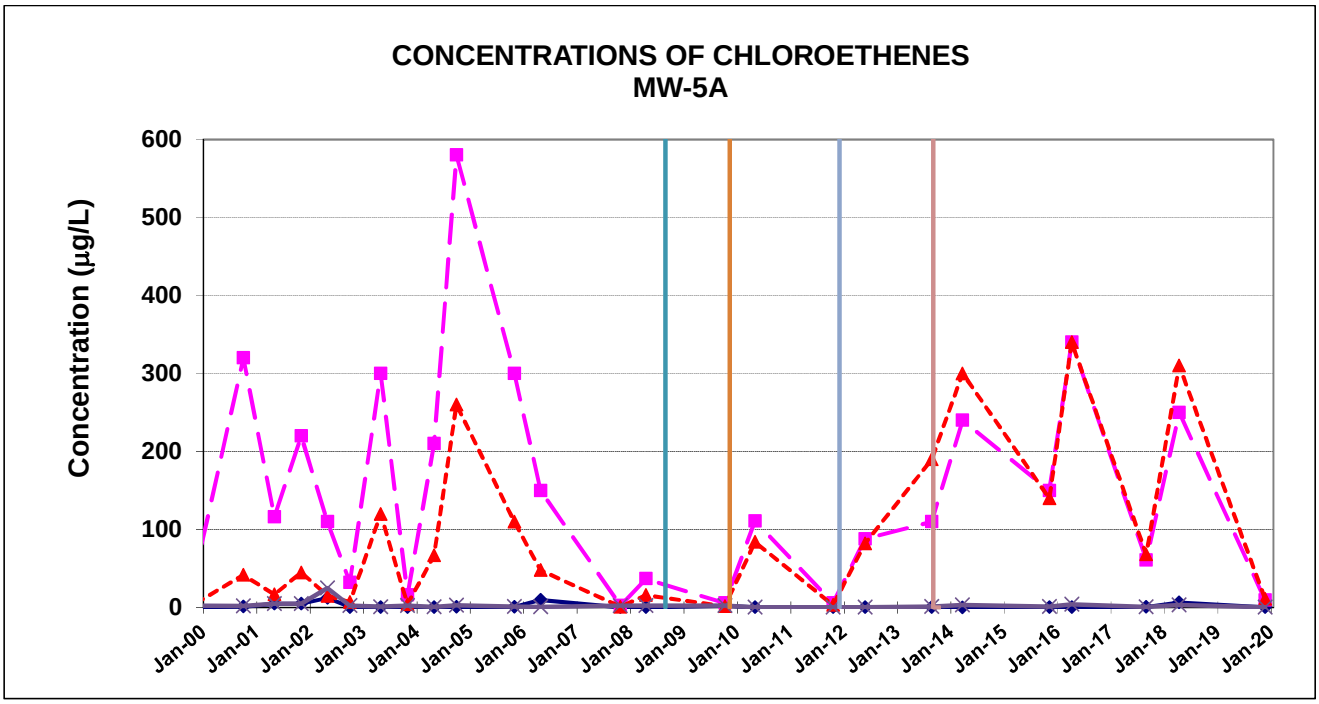
FIGURE 8

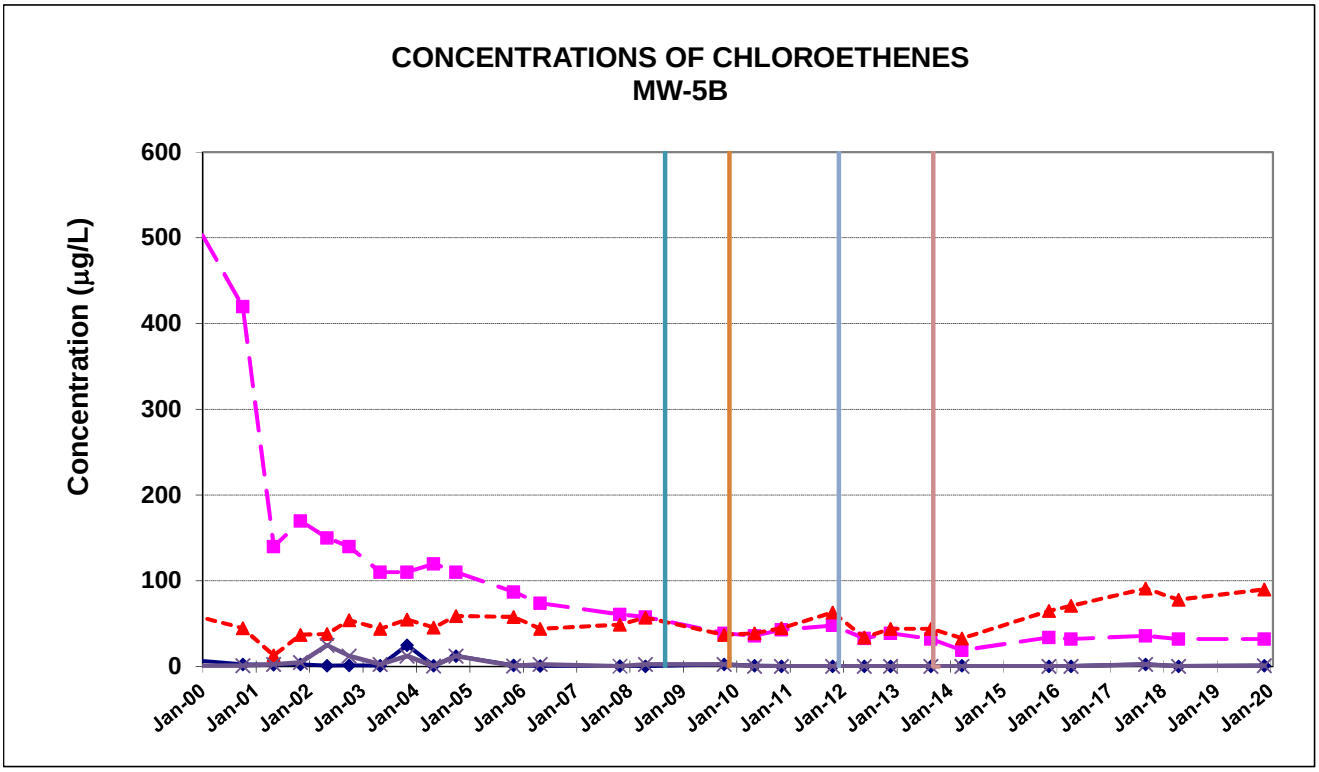
FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202





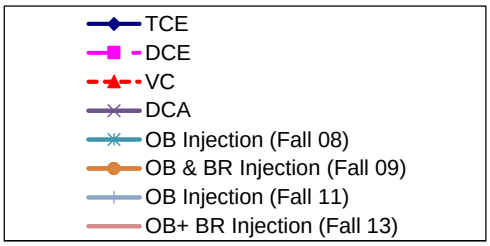


FIGURE 9

FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202

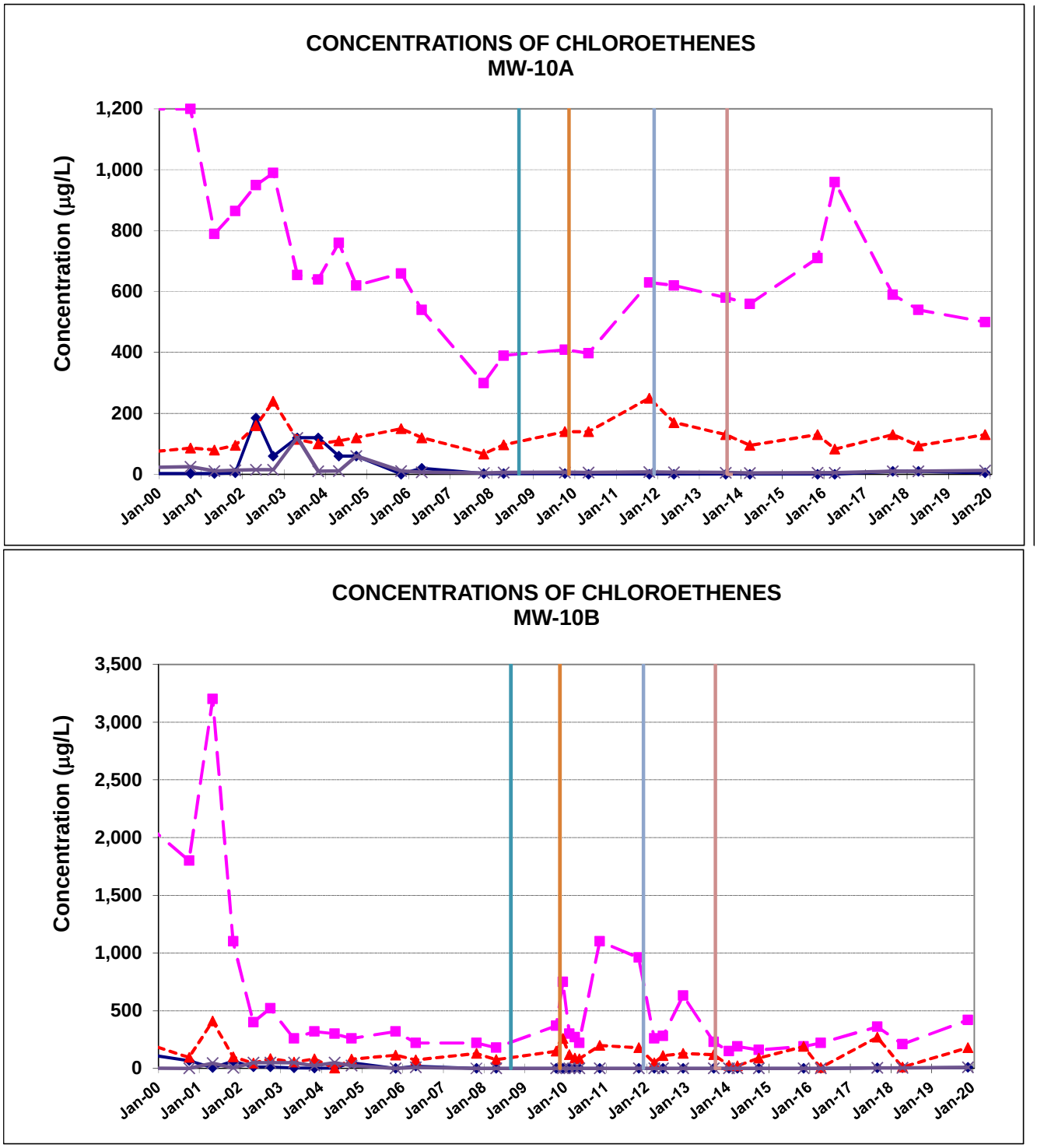


FIGURE 10

FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202

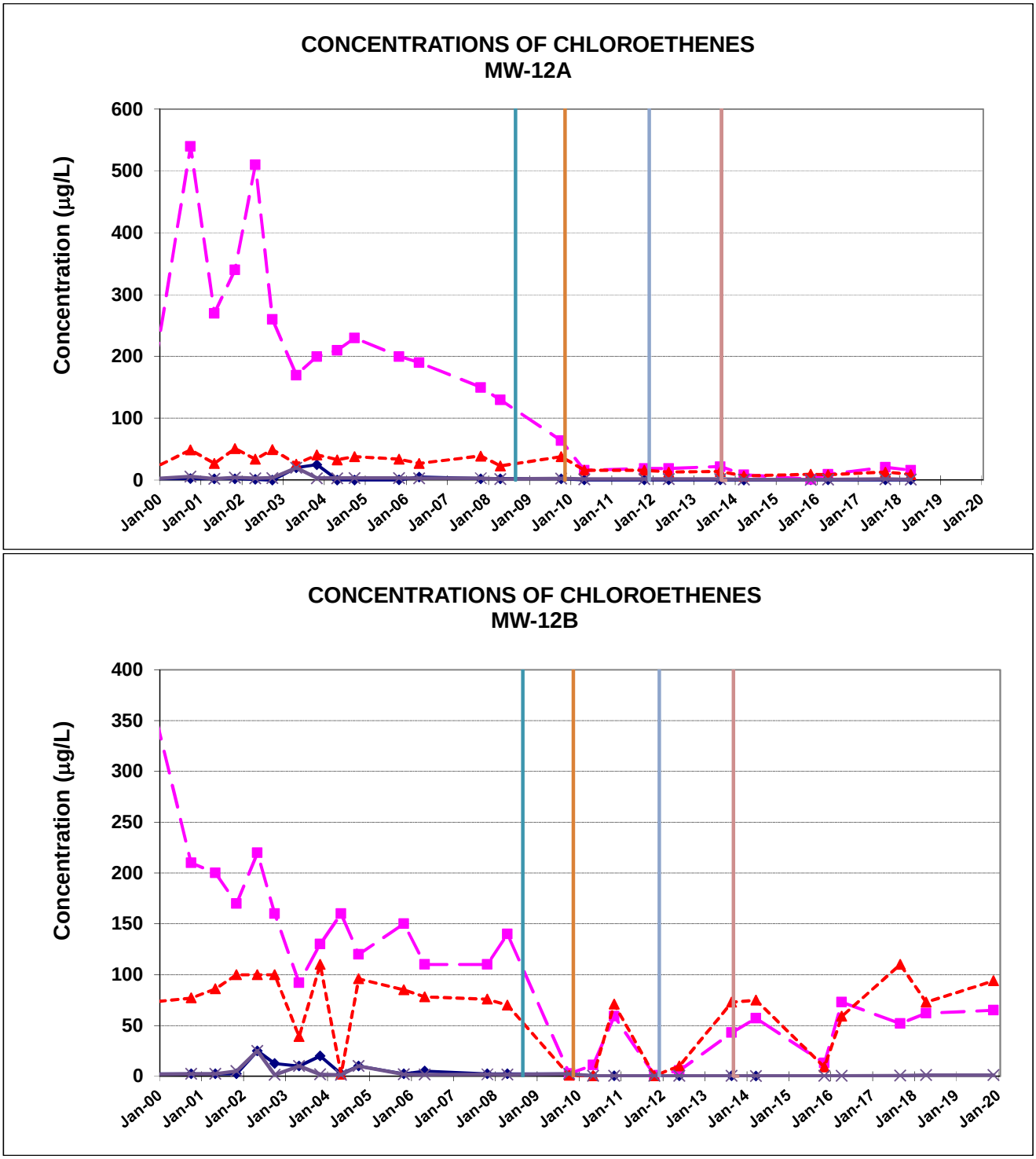


FIGURE 11

FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202

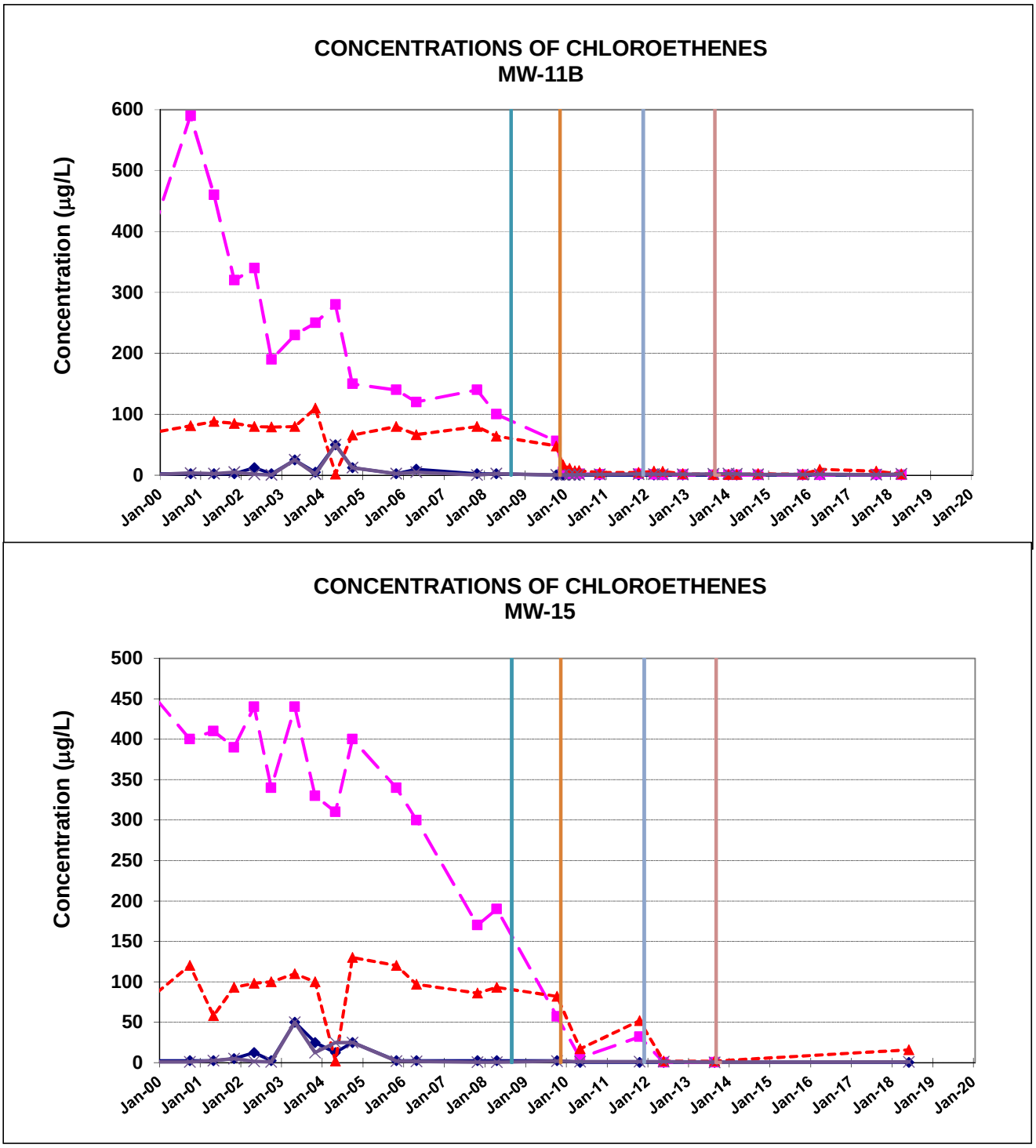


FIGURE 12

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-11B AND MW-15

AECOM

257 West Genesee Street, Buffalo, NY 14202

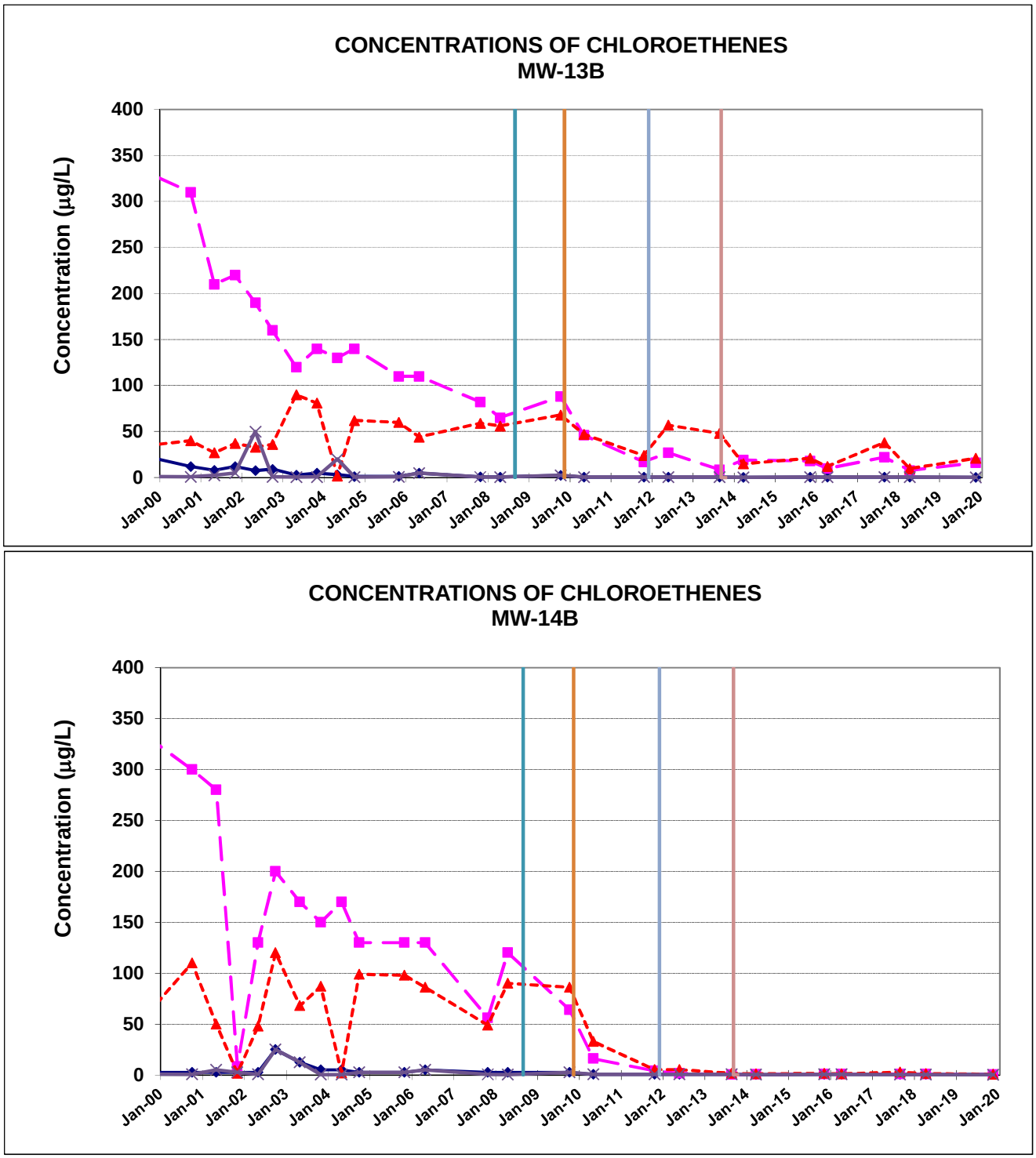


FIGURE 13

FORMER CARBORUNDUM COMPANY

LONG TERM TRENDS OF CHLORINATED ETHENES IN WELLS MW-13B AND MW-14B

AECOM

257 West Genesee Street, Buffalo, NY 14202

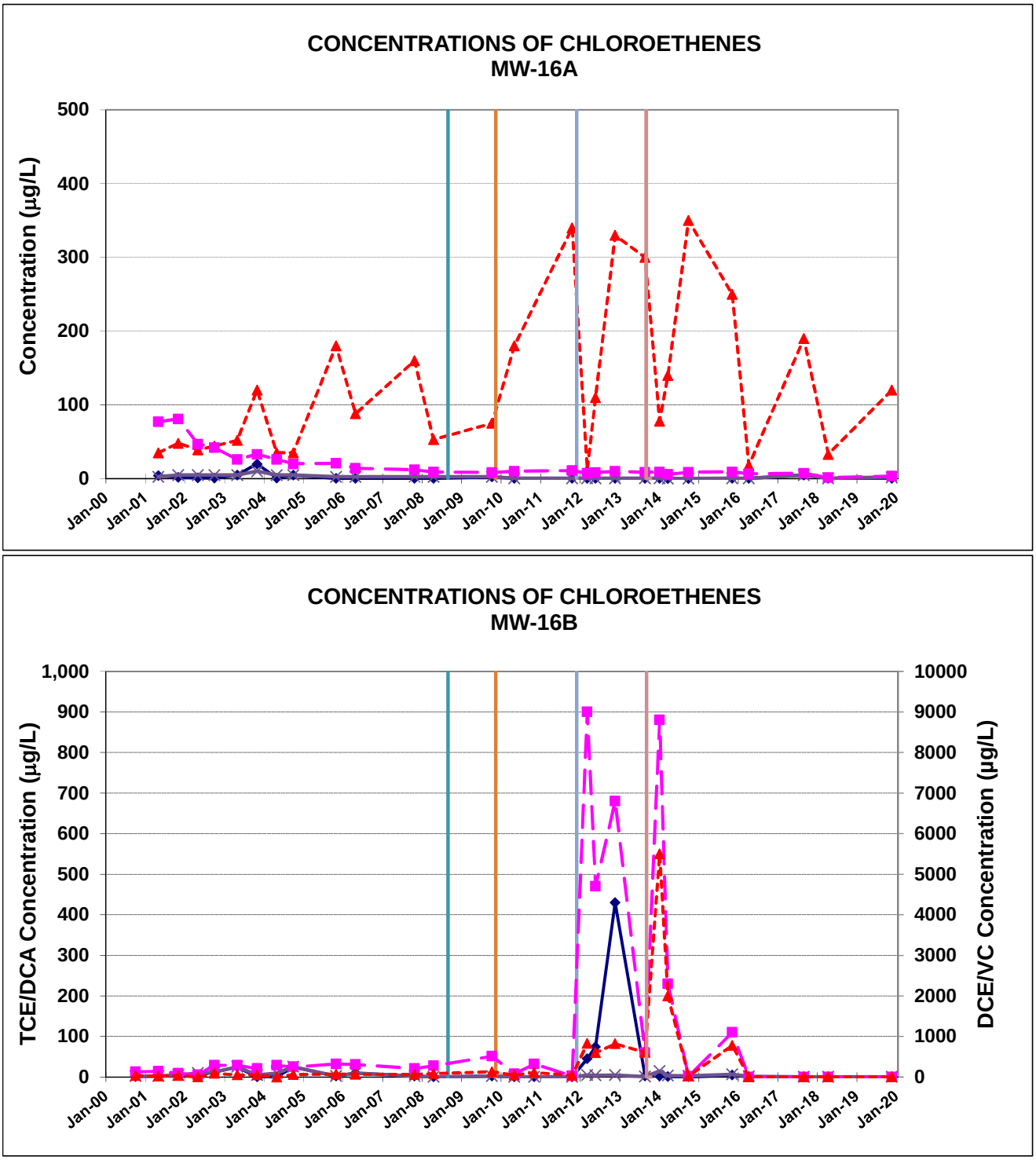


FIGURE 14

FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202

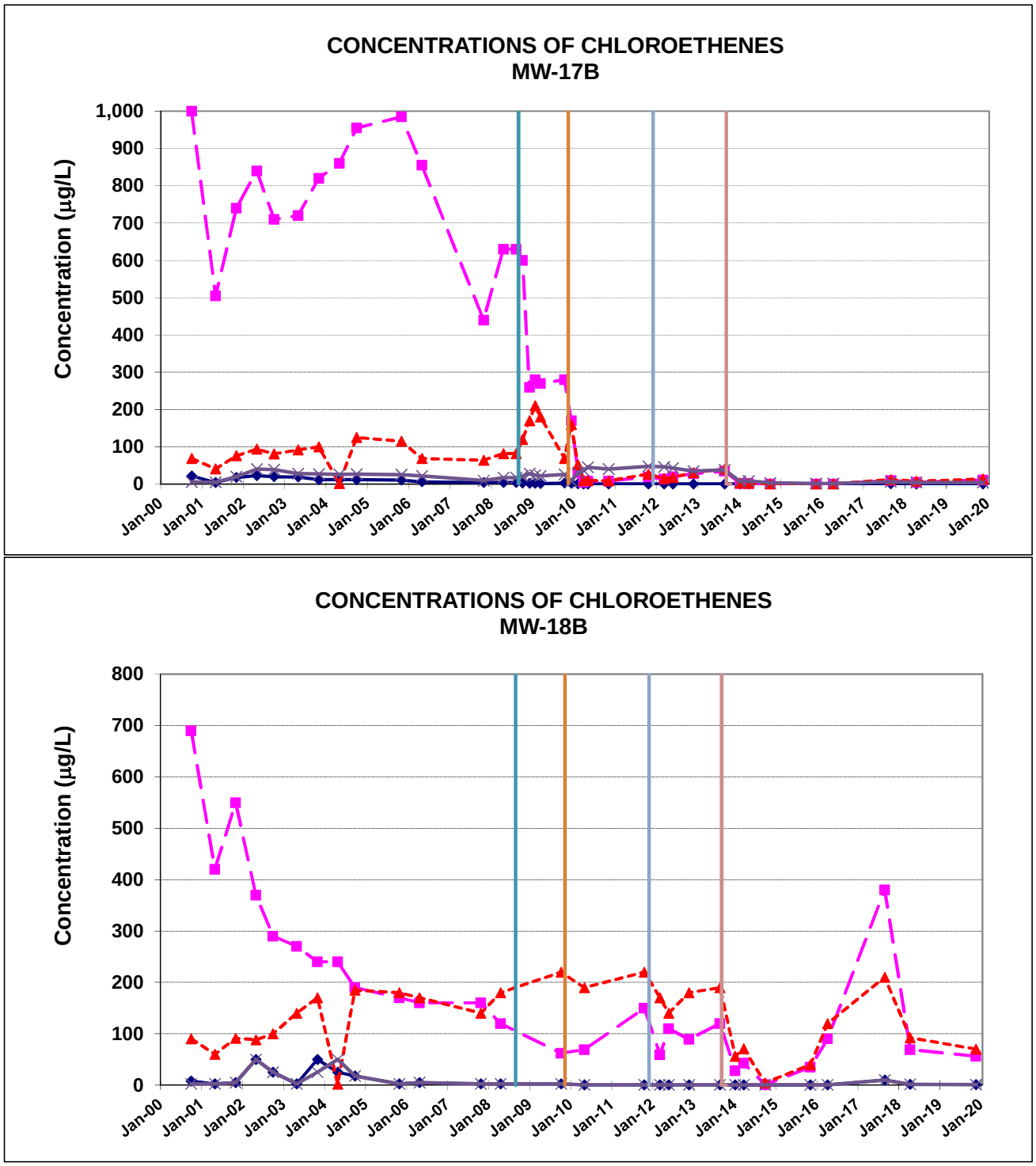


FIGURE 15

FORMER CARBORUNDUM COMPANY

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

AECOM

257 West Genesee Street, Buffalo, NY 14202

Appendix A

Groundwater Sampling Logs

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-5A

Well Diameter: 2"

Samplers: T. Urban

Weather: 30ºF Cloudy, breezy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/3/2019 | Time: 10:50 (hhmm)

Initial Depth to Water: 9.41

Depth to Bottom: 21.5

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
10:50	9.41	310	0.0	11.9	0.818	3.50	7.77	-63.7	3.2	
10:55	10.00	220	0.3	12.6	0.778	3.86	8.00	-58.2	10.4	
11:00	9.84	220	0.6	11.8	0.767	3.86	8.11	-40.1	2.9	
11:05	9.84	220	0.9	12.1	0.765	3.79	8.11	-25.4	2.9	
11:10	9.84	220	1.2	12.2	0.765	3.68	8.10	-11.5	2.1	
11:15	9.84	220	1.5	12.4	0.769	3.61	8.09	-6.4	2.4	
11:20	9.85	220	1.7	12.1	0.770	3.46	8.08	0.7	1.6	
11:25	9.85	220	2.0	12.3	0.774	3.35	8.07	6.9	1.7	
11:30	9.85	220	2.3	12.0	0.779	3.25	8.05	9.9	1.4	
11:35	9.85	220	2.6	11.9	0.750	3.17	8.04	13.1	1.3	

Sample Collection Method: Peristaltic Pump | **Date:** 12/3/2019 | **Time:** 11:35 | **Total Volume of Water Purged:** 2.25 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	20
Ferrous Iron (mg/L)	0.00
Hydrogen Sulfide (mg/L)	0.0
DTW	

Duplicate taken at this well: FD-120319.

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-5B

Well Diameter: 2"

Samplers: T. Urban

Weather: 25ºF sunny, calm

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/3/2019 | Time: 9:13 (hhmm)

Initial Depth to Water: 9.07

Depth to Bottom: 39.5

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
9:15	9.07	380	0.0	12.2	1.432	4.55	8.11	-68.0	35.2	
9:20	9.23	380	0.5	12.3	1.457	1.27	7.59	-85.4	17.0	
9:25	9.23	380	1.0	12.3	1.473	1.50	7.47	-73.2	20.7	
9:30	9.23	380	1.5	12.2	1.464	1.35	7.34	-55.8	16.3	
9:35	9.23	380	2.0	12.2	1.442	0.96	7.22	-46.00	14.6	
9:40	9.23	380	2.5	12.3	1.430	0.75	7.18	-43.5	14.2	
9:45	9.23	380	3.0	12.1	1.426	0.63	7.16	-43.9	14.7	
9:50	9.23	380	3.5	12.1	1.424	0.58	7.16	-45.1	17.0	
9:55	9.23	380	4.0	12.1	1.420	0.52	7.15	-47.4	20.5	
10:00	9.23	380	4.5	11.9	1.421	0.48	7.15	-48.7	21.9	
10:05	9.23	380	5.0	12.0	1.421	0.47	7.15	-49.0	22.7	

Sample Collection Method: Peristaltic Pump | **Date:** 12/3/2019 | **Time:** 10:05 | **Total Volume of Water Purged:** 5.5 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	50
Ferrous Iron (mg/L)	0.36
Hydrogen Sulfide (mg/L)	0.0
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-6

Well Diameter: 2"

Samplers: T. Urban

Weather: 40ºF, Overcast, calm

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/4/2019 | **Time:** 12:40 (hhmm)

Initial Depth to Water: 6.55 | **Depth to Bottom:** 43.00

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
12:40	6.55	300	0.0	10.6	1.158	4.61	7.89	-237.6	2.0	
12:45	6.62	300	0.4	11.8	1.199	0.48	7.24	-285.8	1.0	
12:50	6.62	300	0.8	11.8	1.198	0.41	7.23	-298.4	0.8	
12:55	6.62	300	1.2	11.8	1.197	0.29	7.22	-310.6	0.6	
13:00	6.62	300	1.6	11.8	1.195	0.26	7.21	-314.9	0.6	
13:05	6.62	300	2.0	11.8	1.194	0.24	7.21	-317.3	0.7	
13:10	6.62	300	2.4	11.8	1.193	0.24	7.20	-318.1	0.5	
13:20	6.62	300	2.8	11.8	1.192	0.22	7.20	-319.8	0.7	missed 13:15 reading
13:25	6.62	300	3.2	11.8	1.192	0.22	7.20	-319.9	0.6	
13:30	6.62	300	3.6	11.8	1.191	0.22	7.20	-319.4	0.4	
13:35	6.62	300	4.0	11.8	1.190	0.22	7.20	-318.5	1.6	
13:40	6.62	300	4.4	11.8	1.190	0.21	7.20	-318.6	1.9	
13:45	6.62	300	4.8	11.8	1.191	0.21	7.20	-318.4	1.8	
13:50	6.62	300	5.2	11.8	1.190	0.21	7.20	-318.1	1.9	
13:55	6.62	300	5.5	11.7	1.190	0.22	7.20	-317.3	1.6	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 13:55 | **Total Volume of Water Purged:** 5.5 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	35
Ferrous Iron (mg/L)	0.03
Hydrogen Sulfide (mg/L)	0.7
DTW	

VOCs + special microbial CENSUS analysis collected in Fall 2019

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☐	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☐	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☐	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☐	1-1000 mL plastic	unpreserved	5210B
COD	☐	1-250 mL plastic	H2SO4	410.4
Sulfide	☐	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-7A

Well Diameter: 2"

Samplers: S. Connelly

Weather: 37ºF, Cloudy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/4/2019 | **Time:** 11:57 (hhmm)

Initial Depth to Water: 7.89 | **Depth to Bottom:** 21.85

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
12:00	7.84			12.0	1.370	0.57	7.06	-110.9	9.6	
12:05	10.65			12.3	1.320	0.45	6.93	-129.9	19.0	
12:10	11.28			12.1	1.300	0.37	6.92	-130.7	11.7	
12:15	11.86			12.1	1.260	0.33	6.87	-138.4	6.3	
12:20	12.43			12.2	1.230	0.28	6.86	-144.7	7.1	
12:25	12.83			12.1	1.230	0.27	6.82	-150.6	8.5	
12:30	13.21			12.1	1.240	0.27	6.80	-151.4	8.6	
12:35	13.53			12.0	1.240	0.26	6.78	-152.0	8.9	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 12:35 | **Total Volume of Water Purged:** 2.0 gal

Hach Test Kits

Alkalinity (mg/L)	770
Carbon Dioxide (mg/L)	100
Ferrous Iron (mg/L)	1.47
Hydrogen Sulfide (mg/L)	1.0
DTW	

Collected MS/MSD at this location. + special microbial CENSUS analysis collected in Fall 2019

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-7B

Well Diameter: 2"

Samplers: E. Au

Weather: 30ºF, Cloudy, calm

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/3/2019 | Time: 13:35 (hhmm)

Initial Depth to Water: 6.70

Depth to Bottom: 43.43

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
13:35	6.80	350	0.0	9.8	1.480	2.30	7.49	-108.1	10.9	sulfer smell
13:40	6.80	350	0.5	11.7	1.460	0.44	7.25	-118.6	9.8	
13:45	6.80	350	0.9	11.7	1.470	0.40	7.24	-121.1	5.9	
13:50	6.80	350	1.4	11.6	1.480	0.600	7.20	-118.7	5.7	
13:55	6.70	350	1.8	11.7	1.490	0.61	7.17	-112.2	4.3	
14:00	6.70	350	2.3	11.6	1.490	0.42	7.15	-105.6	2.6	
14:05	6.70	350	2.8	11.6	1.490	0.38	7.14	-105.7	2.0	
14:10	6.70	350	3.2	11.5	1.490	0.33	7.13	-102.7	1.7	
14:15	6.70	350	3.7	11.5	1.490	0.29	7.12	-103.6	1.6	

Sample Collection Method: Peristaltic Pump | **Date:** 12/3/2019 | **Time:** 14:15 | **Total Volume of Water Purged:** 4.0 gal

Hach Test Kits

Alkalinity (mg/L)	320
Carbon Dioxide (mg/L)	20
Ferrous Iron (mg/L)	0.00
Hydrogen Sulfide (mg/L)	2.0
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-10A

Well Diameter: 2"

Samplers: S. Connelly

Weather: 36ºF, Cloudy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/4/2019 | Time: 10:35 (hhmm)

Initial Depth to Water: 8.34

Depth to Bottom: 20.82

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
10:37	8.45	180	0.0	12.6	1.400	1.37	7.15	-108.5	31	
10:42	8.49	180	0.2	13.2	1.390	0.40	7.20	-120.6	25	
10:47	8.49	180	0.5	13.2	1.380	0.45	7.20	-116.9	13	
10:52	8.50	180	0.7	13.2	1.370	0.51	7.19	-112.3	9	
10:57	8.50	180	1.0	13.3	1.350	0.56	7.19	-110.2	6	
11:02	8.50	180	1.2	13.3	1.340	0.59	7.18	-109.8	3	
11:07	8.50	180	1.4	13.3	1.340	0.58	7.17	-107.2	2	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 11:07 | **Total Volume of Water Purged:** 1.75 gal

Hach Test Kits

Alkalinity (mg/L)	300
Carbon Dioxide (mg/L)	25
Ferrous Iron (mg/L)	1.05
Hydrogen Sulfide (mg/L)	0.0
DTW	

+ special microbial CENSUS analysis collected in Fall 2019

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-10B

Well Diameter: 4"

Samplers: S. Connelly

Weather: 35ºF, Cloudy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/4/2019 | Time: 8:51 (hhmm)

Initial Depth to Water: 7.84

Depth to Bottom: 38.8

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
8:53	7.84	350	0.0	12.0	1.440	1.21	7.02	141.9	0.5	
8:58	7.84	350	0.5	13.2	1.410	0.42	6.87	-20.3	1.2	
9:03	7.84	350	0.9	13.3	1.400	0.37	6.85	-66.0	0.7	
9:08	7.84	350	1.4	13.3	1.410	0.62	6.86	-82.3	0.5	
9:13	7.84	350	1.8	13.2	1.410	0.43	6.86	-88.5	0.5	
9:18	7.84	350	2.3	13.2	1.410	0.39	6.87	-89.5	0.5	
9:23	7.84	350	2.8	13.3	1.410	0.33	6.87	-90.2	0.5	
9:28	7.84	350	3.2	13.3	1.410	0.28	6.87	-93.5	0.6	
9:33	7.84	350	3.7	13.2	1.410	0.27	6.88	-94.7	0.6	
9:38	7.84	350	4.2	13.2	1.420	0.22	6.87	-94.4	0.6	
9:43	7.84	350	4.6	13.1	1.490	0.20	6.85	-88.2	0.4	
9:48	7.84	350	5.1	13.1	1.510	0.17	6.85	-86.4	0.4	
9:53	7.84	350	5.5	13.1	1.520	0.16	6.85	-85.9	0.4	
9:58	7.84	350	6.0	13.0	1.530	0.16	6.84	-86.2	0.4	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 9:58 | **Total Volume of Water Purged:** 8 gal

Hach Test Kits

Alkalinity (mg/L)	300
Carbon Dioxide (mg/L)	30
Ferrous Iron (mg/L)	0.97
Hydrogen Sulfide (mg/L)	0.1
DTW	

+ special microbial CENSUS analysis collected in Fall 2019

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-12A

Well Diameter: 2"

Samplers:

Weather:

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data:

Method:

Date: 12/3/2019 **Time:** (hhmm)

Initial Depth to Water feet below top of PVC

Depth to Bottom 14.85

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:

Well was discovered destroyed. No sample was collected.

Sample Collection Method:

Date:

Time:

Total Volume of Water Purged:

Hach Test Kits

Alkalinity (mg/L)	
Carbon Dioxide (mg/L)	
Ferrous Iron (mg/L)	
Hydrogen Sulfide (mg/L)	
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☐	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☐	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☐	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☐	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☐	1-1000 mL plastic	unpreserved	5210B
COD	☐	1-250 mL plastic	H2SO4	410.4
Sulfide	☐	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-12B

Well Diameter: 4"

Samplers: T. Urban

Weather: 32ºF, Snow

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/5/2019 | Time: 8:52 (hhmm)

Initial Depth to Water: 2.16

Depth to Bottom: 30.40

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
8:55	2.16	330	0.0	10.9	0.599	4.51	7.03	111.5	1.6	
9:00	2.16	330	0.4	11.2	0.420	2.75	7.10	96.2	1.5	
9:05	2.16	330	0.9	11.3	0.453	0.58	7.11	18.0	2.2	
9:10	2.16	330	1.3	11.3	0.464	0.52	7.14	-35.2	0.1	
9:15	2.16	330	1.7	11.3	0.532	0.42	7.18	-50.8	1.3	
9:20	2.16	330	2.2	11.4	1.190	0.32	7.22	-66.4	1.5	
9:25	2.16	330	2.6	11.3	1.212	0.24	7.25	-54.2	2.3	
9:30	2.16	330	3.1	11.3	1.216	0.27	7.25	-92.3	2.9	
9:35	2.16	330	3.5	11.3	1.216	0.26	7.26	-98.7	2.7	
9:40	2.16	330	3.9	11.4	1.216	0.26	7.26	-102.0	2.4	
9:45	2.16	330	4.4	11.3	1.219	0.25	7.26	-105.8	2.0	
9:50	2.16	330	4.8	11.3	1.219	0.24	7.26	-103.1	2.0	
9:55	2.16	330	5.2	11.3	1.219	0.24	7.26	-109.9	1.0	
10:00	2.16	330	5.7	11.1	1.219	0.23	7.27	-112.0	0.9	
10:05	2.16	330	6.1	11.2	1.220	0.23	7.27	-113.1	1.9	

Sample Collection Method: Peristaltic Pump | **Date:** 12/5/2019 | **Time:** 10:15 | **Total Volume of Water Purged:** 6.0 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	25
Ferrous Iron (mg/L)	0.01
Hydrogen Sulfide (mg/L)	0.0
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-12B

Well Diameter: 4"

Samplers: T. Urban

Weather: 32ºF, Snow

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/5/2019 | Time: 8:52 (hhmm)

Initial Depth to Water: 2.16

Depth to Bottom: 30.40

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
10:10	2.16	330	6.5	11.20	1.220	0.22	7.27	-115.4	0.7	
10:15	2.16	330	7.0	11.20	1.222	0.22	7.27	-116.6	1.2	

Sample Collection Method: Peristaltic Pump | **Date:** 12/5/2019 | **Time:** 10:15 | **Total Volume of Water Purged:** 6.0 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	25
Ferrous Iron (mg/L)	0.01
Hydrogen Sulfide (mg/L)	0.0
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-13B

Well Diameter: 2"

Samplers: E. Au

Weather: 25ºF, Cold

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/3/2019 | Time: 11:00 (hhmm)

Initial Depth to Water: 6.50

Depth to Bottom: 36.55

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
11:00	7.65	300	0.0	11.3	4.630	7.11	7.48	32.6	874	grey colored
11:05	7.70	300	0.4	11.6	4.570	8.45	7.33	36.0	62.0	now slightly cloudy
11:10	7.70	300	0.8	11.7	4.500	8.19	7.24	40.2	71.2	floating particles
11:20	7.70	300	1.2	11.6	4.080	6.68	7.23	58.5	76.3	missed 11:15 reading
11:25	7.70	300	1.6	11.3	3.620	5.57	7.15	64.7	72.5	
11:30	7.70	300	2.0	11.4	3.330	4.67	7.08	68.8	46.5	
11:35	7.70	300	2.4	11.4	3.210	4.32	7.10	70.7	38.0	
11:40	7.70	300	2.8	11.4	3.030	3.81	7.08	69.5	18.0	
11:45	7.70	300	3.2	11.4	2.860	3.17	7.05	66.4	17.8	
11:50	7.70	300	3.6	11.6	2.750	2.83	7.04	62.7	11.8	
11:55	7.70	300	4.0	1.5	2.720	2.58	7.04	60.2	10.9	
12:00	7.70	300	4.4	11.8	2.690	2.42	7.03	58.6	8.7	

Sample Collection Method: Peristaltic Pump | **Date:** 12/3/2019 | **Time:** 12:05 | **Total Volume of Water Purged:** 4.5 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	30
Ferrous Iron (mg/L)	0.12
Hydrogen Sulfide (mg/L)	0.0
DTW	

VOCs only.

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☐	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☐	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☐	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☐	1-1000 mL plastic	unpreserved	5210B
COD	☐	1-250 mL plastic	H2SO4	410.4
Sulfide	☐	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-14B

Well Diameter: 2"

Samplers: E. Au

Weather: 32ºF, Snow

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data:

Method: Low Flow | Date: 12/5/2019 | Time: 9:10 (hhmm)

Initial Depth to Water: 4.15 feet below top of PVC

Depth to Bottom: 31.10

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
9:10	4.50	325	0.0	11.2	2.690	8.80	7.83	23.4	52.4	
9:15	5.75	325	0.4	11.6	3.350	9.07	8.00	4.6	68.2	
9:20	5.65	325	0.9	11.9	3.360	4.71	7.80	5.2	29.0	
9:25	5.60	325	1.3	11.8	3.370	3.43	7.63	3.9	46.2	
9:30	5.60	325	1.7	11.9	3.330	2.40	7.52	0.4	51.5	
9:35	5.55	325	2.1	12.0	3.310	2.49	7.46	-4.0	34.8	
9:40	5.65	325	2.6	12.1	3.270	2.31	7.40	-12.1	23.5	
9:45	5.60	325	3.0	12.0	3.230	1.84	7.33	-22.0	11.8	
9:50	5.55	325	3.4	12.0	3.190	1.53	7.29	-30.4	8.8	
9:55	5.55	325	3.9	11.9	3.170	2.06	7.28	-35.3	6.8	
10:00	5.55	325	4.3	12.1	3.120	1.58	7.26	-41.1	6.7	
10:05	5.55	325	4.7	11.9	3.090	1.43	7.24	-45.9	5.1	

Sample Collection Method: Peristaltic Pump | **Date:** 12/5/2019 | **Time:** 10:10 | **Total Volume of Water Purged:** 5.0 gal

Hach Test Kits

Alkalinity (mg/L)	180
Carbon Dioxide (mg/L)	10
Ferrous Iron (mg/L)	0.64
Hydrogen Sulfide (mg/L)	0.0
DTW	

VOCs only

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☐	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☐	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☐	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☐	1-1000 mL plastic	unpreserved	5210B
COD	☐	1-250 mL plastic	H2SO4	410.4
Sulfide	☐	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park	**Well ID:** MW-16A	**Well Diameter:** 2"

Samplers: T. Urban

Weather: 32ºF, Cloudy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/3/2019 | **Time:** 13:05 (hhmm)

Initial Depth to Water: 3.23 | **Depth to Bottom:** 19.25

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
13:05	3.23	250	0.0	11.4	2.858	2.66	6.97	38.1	1.7	
13:10	5.80	250	0.3	11.9	2.907	1.09	6.92	34.3	2.4	
13:15	7.11	250	0.7	12.0	2.018	3.19	7.08	48.8	2.0	
13:20	8.92	250	1.0	11.9	1.615	5.99	7.25	47.8	2.2	
13:25	10.17	250	1.3	11.9	1.580	6.32	7.26	47.0	2.2	
13:30	12.05	250	1.7	11.9	1.577	6.40	7.26	49.1	1.9	
13:35	13.20	250	2.0	11.9	1.588	6.35	7.25	48.6	1.6	
13:40	14.50	250	2.3	12.1	1.587	6.29	7.25	48.9	1.5	
13:45	15.11	250	2.6	12.2	1.586	6.26	7.24	48.6	1.1	

Sample Collection Method: Peristaltic Pump | **Date:** 12:3/19 | **Time:** 13:45 | **Total Volume of Water Purged:** 2.75 gal

Hach Test Kits

Alkalinity (mg/L)	385
Carbon Dioxide (mg/L)	NM
Ferrous Iron (mg/L)	0.05
Hydrogen Sulfide (mg/L)	0.0
DTW	15.15

Water in flushmount. All stable except drawdown, grab sampled.

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park	**Well ID:** MW-16B	**Well Diameter:** 2"

Samplers: T. Urban

Weather: 37ºF, Cloudy, calm

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/3/2019 | Time: 14:27 (hhmm)

Initial Depth to Water: 2.97 | Depth to Bottom: 39.12

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
14:30	2.97	400	0.0	11.4	0.649	1.94	7.20	-151.2	5.2	
14:35	3.10	400	0.5	11.9	0.579	0.49	7.14	-214.3	4.8	
14:40	3.10	400	1.1	12.1	0.799	0.38	7.09	-231.4	5.1	
14:45	3.12	400	1.6	12.1	1.056	0.27	7.08	-262.0	4.0	
14:50	3.12	400	2.1	12.1	1.199	0.23	7.08	-281.1	7.0	
14:55	3.12	400	2.6	12.1	1.243	0.21	7.08	-294.2	11.8	
15:00	3.12	400	3.2	12.0	1.287	0.20	7.08	-306.1	16.5	
15:05	3.12	400	3.7	12.1	1.310	0.19	7.08	-316.3	21.7	
15:10	3.12	400	4.2	12.1	1.326	0.18	7.08	-320.5	23.0	
15:15	3.12	400	4.8	12.0	1.337	0.18	7.09	-322.0	10.8	
15:20	3.12	400	5.3	12.1	1.348	0.17	7.09	-322.1	10.4	
15:25	3.12	400	5.8	12.0	1.351	0.17	7.09	-322.0	11.2	

Sample Collection Method: Peristaltic Pump | **Date:** 12/3/2019 | **Time:** 15:25 | **Total Volume of Water Purged:** 5.5 gal

Hach Test Kits

Alkalinity (mg/L)	770
Carbon Dioxide (mg/L)	35
Ferrous Iron (mg/L)	0.08
Hydrogen Sulfide (mg/L)	2.0
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-17A

Well Diameter: 2"

Samplers: E. Au; T. Urban

Weather: 32ºF, Snow

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | Date: 12/5/2019 | Time: 11:20 (hhmm)

Initial Depth to Water: 3.40 | **Depth to Bottom:** 16.15

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
11:20	3.70	350	0.0	11.7	0.899	1.51	8.17	-147.8	32.8	
11:25	4.00	350	0.5	13.5	0.957	0.40	7.72	-164.3	12.1	
11:30	4.13	350	0.9	13.4	0.966	0.33	7.66	-167.9	7.1	
11:35	4.10	350	1.4	13.5	0.974	0.29	7.60	-167.6	4.0	
11:40	4.15	350	1.8	13.3	0.961	0.26	7.67	-170.2	3.5	
11:50	4.16	350	2.8	13.4	0.973	0.24	7.60	-167.5	1.5	missed 11:45 reading
11:55	4.15	350	3.2	13.5	0.972	0.23	7.60	-167.7	0.7	
12:00	4.15	350	3.7	13.2	0.974	0.23	7.58	-166.8	0.7	
12:05	4.17	350	4.2	13.3	0.970	0.23	7.58	-166.4	0.2	

Sample Collection Method: Peristaltic Pump | **Date:** 12/5/2019 | **Time:** 12:05 | **Total Volume of Water Purged:** 5.0 gal

Hach Test Kits

Alkalinity (mg/L)	440
Carbon Dioxide (mg/L)	20
Ferrous Iron (mg/L)	0.55
Hydrogen Sulfide (mg/L)	0.0
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-17B

Well Diameter: 2"

Samplers: E. Au; T. Urban

Weather: 32ºF, Snow

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data:

Method: Low Flow

Date: 12/5/2019 **Time:** 12:25 (hhmm)

Initial Depth to Water (feet below top of PVC): 4.15

Depth to Bottom (feet below top of PVC): 30.92

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
12:35	3.40	300	0.0	10.6	1.334	0.99	6.52	-101.9	108.2	
12:40	3.60	300	0.4	12.1	1.350	0.25	6.38	-131.9	86.7	
12:45	4.10	300	0.8	12.2	1.348	0.20	6.42	-146.2	44..5	
12:50	4.29	300	1.2	12.3	1.336	0.21	6.45	-161.9	22.2	
12:55	3.92	300	1.6	12.4	1.356	0.20	6.65	-172.3	21.2	
13:00	4.30	300	2.0	12.0	1.348	0.20	6.47	-187.9	18.9	
13:05	4.30	300	2.4	12.0	1.360	.0.19	6.48	-209.3	23.9	
13:10	4.33	300	2.8	12.2	1.348	0.19	6.49	-232.5	11.5	
13:15	4.12	300	3.2	12.3	1.342	0.18	6.51	-244.5	22.0	
13:20	4.31	300	3.6	12.3	1.348	0.18	6.51	-264.9	10.5	
13:25	4.30	300	4.0	12.3	1.349	0.18	6.52	-279.5	15.5	
13:30	4.30	300	4.4	12.3	1.350	0.17	6.53	-293.5	7.0	
13:35	4.30	300	4.8	12.3	1.343	0.17	6.52	-299.4	12.4	
13:40	4.33	300	5.2	12.7	1.360	0.16	6.51	-304.9	10.3	
13:45	4.33	300	5.5	12.6	1.375	0.15	6.52	-311.5	15.4	

Sample Collection Method: Peristaltic Pump

Date: 12/5/2019 **Time:** 13:50

Total Volume of Water Purged: 6.0 gal

Hach Test Kits

Alkalinity (mg/L)	770
Carbon Dioxide (mg/L)	45
Ferrous Iron (mg/L)	1.35
Hydrogen Sulfide (mg/L)	5.0
DTW	

Slightly effervescing bubbles coming up tubing an when filling vials.

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-18A

Well Diameter: 2"

Samplers: T. Urban

Weather: 37ºF, Overcast, slight breeze

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/4/2019 | **Time:** 8:42 (hhmm)

Initial Depth to Water: 4.35 | **Depth to Bottom:** 17.76

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
8:45	4.35	180	0.0	10.5	0.829	5.76	6.62	82.7	1.3	
8:50	4.65	180	0.2	12.6	0.861	3.11	7.18	77.7	0.3	
8:55	4.72	180	0.5	12.7	0.880	2.88	7.23	61.8	0.8	
9:00	4.82	180	0.7	12.9	0.892	2.33	7.25	17.0	0.3	
9:05	4.93	200	1.0	13.2	0.897	1.94	7.25	-30.5	0.4	
9:10	5.00	200	1.2	13.2	0.897	1.63	7.25	-61.7	0.2	
9:15	5.09	200	1.5	13.4	0.897	1.46	7.25	-78.7	0.3	
9:20	5.15	200	1.8	13.4	0.897	1.16	7.25	-97.0	0.2	
9:25	5.15	200	2.0	13.1	0.898	1.01	7.25	-106.2	0.5	
9:30	5.20	200	2.3	13.4	0.896	0.99	7.25	-110.4	0.8	
9:35	5.28	200	2.6	13.5	0.897	0.88	7.25	-115.1	1.3	
9:40	5.30	200	2.8	13.4	0.897	0.81	7.25	-119.7	1.8	
9:45	5.30	200	3.1	13.4	0.894	0.78	7.25	-122.3	2.2	
9:50	5.30	200	3.4	13.4	0.894	0.84	7.25	-122.2	3.4	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 9:50 | **Total Volume of Water Purged:** 2.5 gal

Hach Test Kits

Alkalinity (mg/L)	340
Carbon Dioxide (mg/L)	30
Ferrous Iron (mg/L)	0.85
Hydrogen Sulfide (mg/L)	0.0
DTW	

+ special microbial CENSUS analysis in Fall 2019

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Name: IP-BP Hyde Park

Well ID: MW-18B

Well Diameter: 2"

Samplers: T. Urban

Weather: 37ºF, Overcast, slight breeze

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/4/2019 | **Time:** (hhmm) 10:20 | **Initial Depth to Water:** 4.46 | **Depth to Bottom:** 37.73

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
10:35	4.46	280	0.0	12.4	0.203	2.10	7.48	-140.1	3.0	effervescent
10:40	4.75	280	0.4	12.8	0.195	0.81	6.78	-202.7	3.5	
10:45	4.85	280	0.7	13.1	0.435	0.31	6.53	-289.2	9.0	
10:50	4.85	280	1.1	13.0	0.643	0.25	6.55	-322.5	29.6	
10:55	4.87	280	1.5	13.1	0.809	0.23	6.57	-344.9	102.1	
11:00	4.87	280	1.8	12.8	0.751	0.21	6.57	-342.2	151.2	
11:05	4.90	280	2.2	12.9	0.802	0.20	6.57	-348.2	4.0	
11:10	4.90	280	2.6	13.0	0.889	0.19	6.39	-352.3	26.9	
11:15	4.90	280	3.0	12.9	0.917	0.19	6.59	-352.5	11.6	
11:20	4.91	280	3.3	12.9	0.958	0.19	6.60	-353.0	10.9	
11:25	4.92	280	3.7	12.9	0.974	0.18	6.60	-353.5	7.8	
11:30	4.90	280	4.1	13.0	1.033	0.17	6.62	-355.5	2.9	
11:35	4.90	280	4.4	12.9	1.088	0.17	6.64	-356.3	0.6	
11:40	4.90	280	4.8	12.9	1.110	0.17	6.65	-357.4	2.2	
11:45	4.90	280	5.2	12.9	1.091	0.16	6.64	-355.7	3.3	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 11:45 | **Total Volume of Water Purged:** 6.0 gal

Hach Test Kits

Alkalinity (mg/L)	400
Carbon Dioxide (mg/L)	60
Ferrous Iron (mg/L)	0.36
Hydrogen Sulfide (mg/L)	5.0
DTW	

+ special microbial CENSUS analysis in Fall 2019

Field Duplicate collected on the microbial sample: FD-120419

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☑	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☑	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☑	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☑	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☑	1-1000 mL plastic	unpreserved	5210B
COD	☑	1-250 mL plastic	H2SO4	410.4
Sulfide	☑	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Nam IP-BP Hyde Park	**Well ID:** MW-19B	**Well Diameter:** 2"

Samplers:
S. Connelly
E. Au
T. Urban

Weather:
36ºF, Cloudy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/4/2019 | **Time:** 13:55 (hhmm) | **Initial Depth to Water** 4.91 | **Depth to Bottom** 37.65

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C˚)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
13:57	4.91	225	0.0	11.6	0.453	5.86	7.62	-67.5	3.9	
14:02	4.91	225	0.3	12.5	0.321	6.02	7.54	-49.0	2.3	
14:07	4.91	225	0.6	12.6	0.324	5.64	7.41	-34.0	2.1	
14:12	4.91	225	0.9	12.4	0.361	4.65	7.32	-24.4	3.8	
14:17	4.91	225	1.2	12.4	0.419	4.21	7.23	-18.3	3.3	
14:22	4.91	225	1.5	12.4	0.455	3.82	7.18	-17.1	3.8	
14:27	4.91	225	1.8	12.2	0.493	3.68	7.15	-18.7	4.0	
14:32	4.91	225	2.1	12.3	0.468	4.44	7.13	-17.5	3.7	
14:37	4.91	225	2.4	12.2	0.564	3.32	7.11	-27.1	5.2	
14:42	4.91	225	2.7	12.7	0.644	2.90	7.07	-39.9	6.3	
14:47	4.91	225	3.0	13.1	0.800	1.93	7.02	-61.4	4.4	
14:52	4.91	225	3.3	13.1	0.870	1.31	7.03	-71.5	4.0	
14:57	4.91	225	3.6	13.2	0.900	1.15	6.99	-75.7	3.5	
15:02	4.91	225	3.9	13.2	0.950	0.91	6.97	-90.2	2.9	
15:07	4.91	225	4.2	13.1	1.020	0.80	6.96	-99.1	4.1	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 15:37 | **Total Volume of Water Purged:** 5.5 gal

Hach Test Kits

Alkalinity (mg/L)	320
Carbon Dioxide (mg/L)	25
Ferrous Iron (mg/L)	0.14
Hydrogen Sulfide (mg/L)	0.7
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☐	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☐	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☐	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☐	1-1000 mL plastic	unpreserved	5210B
COD	☐	1-250 mL plastic	H2SO4	410.4
Sulfide	☐	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

AECOM

GROUNDWATER SAMPLING LOG

Low Flow Sampling Record

Site Nam IP-BP Hyde Park	**Well ID:** MW-19B	**Well Diameter:** 2"

Samplers:
S. Connelly
E. Au
T. Urban

Weather:
36ºF, Cloudy

Water Volume Calculation

1 inch= 0.041	6 inch= 1.4
1.5 inch= 0.092	8 inch= 2.5
2 inch= 0.163	10 inch= 4
4 inch= 0.64	

= (Total Depth of Well - Depth to Water) × Casing volume per foot

Acceptance Criteria:

Temp	3%
pH	± 0.1 unit
Sp. Cond.	3%
ORP	± 10mV
DO	10%
Turbidity	<50 NTU
Drawdown	<0.3'

Purging Data: feet below top of PVC

Method: Low Flow | **Date:** 12/4/2019 | **Time:** 13:55 (hhmm) | **Initial Depth to Water** 4.91 | **Depth to Bottom** 37.65

Time (hhmm)	DTW (ft)	Pump Rate (ml/min)	Volume (gal.)	Temp (C°)	Sp. Cond (ms/cm)	DO (mg/L)	pH	ORP (mV)	Turb (NTU)	Comments:
15:12	4.91	225	4.5	13.0	1.07	0.60	6.95	-113.1	2.9	
15:17	4.91	225	4.8	13.0	1.08	0.49	6.94	-119.2	2.7	
15:22	4.91	225	5.1	13.0	1.10	0.38	6.95	-125.6	2.8	
15:27	4.91	225	5.4	13.1	1.11	0.31	6.95	-130.3	1.8	
15:32	4.91	225	5.7	13.1	1.12	0.29	6.92	-132.8	2.7	
15:37	4.91	225	6.0	13.0	1.13	0.28	6.93	-135.6	2.0	

Sample Collection Method: Peristaltic Pump | **Date:** 12/4/2019 | **Time:** 15:37 | **Total Volume of Water Purged:** 5.5 gal

Hach Test Kits

Alkalinity (mg/L)	320
Carbon Dioxide (mg/L)	25
Ferrous Iron (mg/L)	0.14
Hydrogen Sulfide (mg/L)	0.7
DTW	

Sample Set

Parameter		Bottle	Pres.	Method
VOCs	☑	3-40 mL glass vial	HCL	EPA 8260C
Dissolved Iron	☐	1-250 mL plastic (field filtered)	HNO3	6010C
TOC	☐	2-40mL glass vial	H2SO4	5310C
M.E.E.P.	☐	3-40 mL glass vial	HCL	RSK-175 mod
Nitrate/Nitrite/ Chloride/Sulfate	☐	1-500mL plastic	unpreserved	300, 353.2 300.0_28D
BOD	☐	1-1000 mL plastic	unpreserved	5210B
COD	☐	1-250 mL plastic	H2SO4	410.4
Sulfide	☐	1-500mL plastic	NaOH/Zn Acetate	4500-S2-F

Appendix B

Data Usability Summary Report

DATA USABILITY SUMMARY REPORT

FORMER CARBORUNDUM COMPANY
HYDE PARK FACILITY
TOWN OF NIAGARA, NIAGARA COUNTY, NY
SITE ID 932036

Analyses Performed by:

EUROFINS TESTAMERICA
BUFFALO, NEW YORK and CANTON, OHIO
MICROBIAL INSIGHTS
KNOXVILLE, TENNESSEE

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

Prepared by:

AECOM
257 WEST GENESEE STREET, SUITE 400
BUFFALO, NY 14202-2657

JANUARY 2020

TABLE OF CONTENTS

TABLES
(Following Text)

ATTACHMENTS

I. INTRODUCTION

This Data Usability Summary Report (DUSR) has been prepared following the guidelines provided in New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation *DER-10, Technical Guidance for Site Investigation and Remediation, Appendix 2B - Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, May 2010. Discussed in this DUSR are the analytical data for seventeen (17) groundwater samples, two (2) field duplicates, one (1) matrix spike/matrix spike duplicate (MS/MSD pair), and three (3) trip blanks collected on December 3-5, 2019.

The samples were collected at the former Carborundum Company, Hyde Park Facility site (Site ID Number 932036), located in the Town of Niagara, Niagara County, NY and sent to Eurofins TestAmerica Laboratories (TA) and Microbial Insights (MI) for analysis. TA and MI are New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratories.

II. ANALYTICAL METHODOLOGIES AND DATA VALIDATION PROCEDURES

The groundwater samples were analyzed for the following parameters (not all samples were analyzed for all parameters/analytes):

Parameter	Method Number
Select Chlorinated Volatile Organic Compounds (CVOCs)*	SW8260C
Dissolved Gases (methane, ethane, ethene, and propane)	RSK SOP-175
Dissolved Iron	6010C
Anions (Chloride, Nitrate, and Sulfate)	EPA 300.0
Biochemical Oxygen Demand (BOD_5)	SM 5210B
Chemical Oxygen Demand	EPA 410.4
Sulfide	SM 4500-S2E
Total Organic Carbon	SM 5310C
Dechlorinating Bacteria**	CENSUS
Field Parameters***	HACH

Notes:

* 1,1,1-Trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, chloroethane, tetrachloroethene, trichloroethene, and vinyl chloride.

** Dehalococcoides spp. (tceA reductase, BAV1 vinyl chloride reductase, vinyl chloride reductase) and Dehalobacter spp.

*** Alkalinity, carbon dioxide, ferrous iron, and hydrogen sulfide.

A limited data validation was performed on the samples in accordance with the guidelines in the following USEPA Region II documents:

- *Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B & 8260C*, SOP HW-24, Revision 4, October 2014;
- *ICP-AES Data Validation*, SOP HW-3a, Rev. 1, September 2016; and
- *Mercury and Cyanide Data Validation*, SOP HW-3c, Rev. 1, September 2016.

The limited data review included a review of: completeness of all required deliverables; holding times; QC results [blanks, instrument tunes, calibration standards, MS/MSD recoveries, duplicate precision, and laboratory control sample (LCS) recoveries] to determine if the data are within the protocol-required QC limits and specifications; a determination that all samples were analyzed using established and agreed upon analytical protocols; an evaluation of the raw data to confirm the results provided in the data summary sheets; and a review of laboratory data qualifiers.

Qualifications applied to the data during the limited data validation include 'J' (estimated results), 'J-' (estimated results, biased low), 'UJ' (estimated quantitation limit), and 'U' (non-detect). Definitions of USEPA data qualifiers are presented at the end of this text. The validated analytical results are presented on Table 1 and Table 2. Validated Form 1s have been presented in Attachment A. Documentation supporting the qualification of data is presented in Attachment B. Only analytical deviations affecting data usability are discussed in this report. Note, the field parameter results are presented in Table 1 for informational purposes only, thus, did not undergo data validation.

III. DATA DELIVERABLE COMPLETENESS

Full deliverable data packages (i.e., NYSDEC ASP Category B or equivalent) were provided by the laboratories (where applicable) and included all reporting forms and raw data necessary to fully evaluate and verify the reported analytical results.

IV. SAMPLE RECEIPT/PRESERVATION/HOLDING TIMES

All samples were received by the laboratory intact, properly preserved, and under proper chain-of-custody (COC) with the following exception:

Analytical parameters for sample MW-16B were not requested on the COC by the field technician. However, the laboratory was able to log in the appropriate analytical parameters based on the sample containers received.

All samples were analyzed within the required holding times (HT).

V. NON-CONFORMANCES

Calibration and Method Blanks

The dissolved iron continuing calibration and/or method blanks associated with samples MW-12B, MW-16A, and MW-16B exhibited contamination above the method detection limit (MDL), but below the quantitation limit (QL). The dissolved iron results for the above referenced samples were qualified 'U' at the QL.

Laboratory Control Samples

The laboratory control samples (LCS) associated with samples MW-7A, MW-10A, MW-17B, and MW-18B exhibited biased low %Rs for BOD. The BOD results for these samples have been qualified 'J-' or 'UJ'.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

The MS/MSD performed on sample MW-7A exhibited biased high percent recoveries (%R) for cis-1,2-dichloroethene and vinyl chloride. The results for these VOCs in this sample have been qualified 'J'.

VI. SAMPLE RESULTS AND REPORTING

Field duplicates were collected at locations MW-5A and MW-18B, both exhibited good field and analytical precision.

All sample results were reported in accordance with method requirements and were adjusted for sample volume (where applicable). Results reported below the QL, but greater than the MDL, are qualified 'J' by the laboratory. Those results being reported from a secondary dilution have been qualified 'D'.

VII. SUMMARY

All sample analyses were found to be compliant with the method criteria, except where previously noted. Those results qualified 'J' (estimated result), 'J-' (estimated results, biased low), 'UJ' (estimated QL), or 'U' (non-detect) during the data review are considered conditionally usable. All other sample results are usable as reported. AECOM does not recommend the re-collection of any samples at this time.

Prepared By: Peter R. Fairbanks, Senior Chemist PF **Date:** 2/4/20

Reviewed By: George E. Kisluk, Senior Chemist GEK **Date:** 2/4/20

DEFINITIONS OF USEPA REGION II DATA QUALIFIERS

U – The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J – The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J- – The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, but biased low.

UJ – The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R – The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

D – The sample results are reported from a secondary dilution.

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW- 5A	MW- 5A	MW- 5B	MW- 6	MW- 7A
Sample ID		FD-120319	MW-5A	MW-5B	MW-6	MW-7A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/03/19	12/03/19	12/03/19	12/04/19	12/04/19
Parameter	Units	Field Duplicate (1-1)				
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/L	1.0 U	1.0 U	2.0 U	1.0 U	2.5 U
1,1-Dichloroethane	UG/L	0.17 J	1.0 U	2.0 U	1.0 U	69
1,1-Dichloroethene	UG/L	1.0 U	1.0 U	2.0 U	1.0 U	2.5 U
1,2-Dichloroethene (cis)	UG/L	10	9.5	32	10	21 J
1,2-Dichloroethene (trans)	UG/L	1.0 U	1.0 U	2.0 U	1.0 U	2.5 U
Chloroethane	UG/L	1.0 U	1.0 U	2.0 U	1.0 U	44
Tetrachloroethene	UG/L	1.0 U	1.0 U	2.0 U	1.0 U	2.5 U
Trichloroethene	UG/L	0.40 J	0.47 J	2.0 U	1.0 U	2.5 U
Vinyl chloride	UG/L	13	11	90	78	35 J
Dissolved Gases						
Carbon Dioxide	MG/L	NA	20	50	35	100
Ethane	UG/L	2.4	2.1	0.66 J	NA	95
Ethene	UG/L	4.3	3.7	4.8	NA	25
Methane	UG/L	160	140	270	NA	13,000 D
Propane	UG/L	1.0 U	1.0 U	0.69 J	NA	1.0 U
Dissolved Metals						
Iron, Dissolved	MG/L	0.20 U	0.20 U	0.41	NA	1.5
Miscellaneous Parameters						
Alkalinity	MG/L	NA	385	385	385	770
Biochemical Oxygen Demand (BOD)	MG/L	2.0 U	2.0 U	2.0 U	NA	14 J-
Chemical Oxygen Demand (COD)	MG/L	10 U	4.1 J	9.4 J	NA	42
Chloride	MG/L	89	89	110	NA	12
Ferrous Iron	MG/L	NA	0.01 U	0.36	0.03	1.0

Flags assigned during chemistry validation are shown.

J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.
J-/J+ - The reported concentration is an estimated value, biased low/high.
U - Not detected above the reported quantitation limit. UJ - Not detected. The reported quantitation limit is an estimated value.
Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

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Detection Limits shown are PQL

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW- 5A	MW- 5A	MW- 5B	MW- 6	MW- 7A
Sample ID		FD-120319	MW-5A	MW-5B	MW-6	MW-7A
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/03/19	12/03/19	12/03/19	12/04/19	12/04/19
Parameter	Units	Field Duplicate (1-1)				
Miscellaneous Parameters						
Hydrogen Sulfide	MG/L	NA	0.1 U	0.1 U	0.1 U	0.1 U
Nitrate-Nitrogen	MG/L	0.59	0.59	0.25 U	NA	0.25 U
Sulfate (as SO4)	MG/L	98	97	240	NA	70
Sulfide	MG/L	1.1	1.0 U	1.1	NA	1.0 U
Total Organic Carbon (TOC)	MG/L	0.64 J	0.68 J	3.3	NA	17
BAV1 Vinyl Chloride Reductase	CELLS/ML	NA	NA	NA	0.50 U	241
Dehalobacter spp.	CELLS/ML	NA	NA	NA	4.9 U	21.7 U
Dehalococcoides spp.	CELLS/ML	NA	NA	NA	21.3	2,300
tceA Reductase	CELLS/ML	NA	NA	NA	0.50 U	203
Vinyl Chloride Reductase	CELLS/ML	NA	NA	NA	7.7	946

Flags assigned during chemistry validation are shown.

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Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

Detection Limits shown are PQL

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW- 7B	MW-10A	MW-10B	MW-12B	MW-13B
Sample ID		MW-7B	MW-10A	MW-10B	MW-12B	MW-13B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/03/19	12/04/19	12/04/19	12/05/19	12/03/19
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/L	1.0 U	25 U	20 U	2.5 U	1.0 U
1,1-Dichloroethane	UG/L	1.0 U	25 U	20 U	2.5 U	0.17 J
1,1-Dichloroethene	UG/L	1.0 U	25 U	20 U	2.5 U	1.0 U
1,2-Dichloroethene (cis)	UG/L	1.3	500	420	65	16
1,2-Dichloroethene (trans)	UG/L	1.0 U	25 U	4.0 J	2.5 U	1.0 U
Chloroethane	UG/L	1.0 U	25 U	20 U	2.5 U	1.0 U
Tetrachloroethene	UG/L	1.0 U	25 U	20 U	2.5 U	1.0 U
Trichloroethene	UG/L	1.0 U	5.0 J	20 U	2.5 U	0.19 J
Vinyl chloride	UG/L	10	130	180	94	21
Dissolved Gases						
Carbon Dioxide	MG/L	20	25	30	25	30
Ethane	UG/L	0.58 J	2.4	1.8	0.89 J	NA
Ethene	UG/L	3.3	36	27	5.3	NA
Methane	UG/L	290	2,000	1,500	210	NA
Propane	UG/L	1.0 U	1.0 U	4.1	1.2	NA
Dissolved Metals						
Iron, Dissolved	MG/L	0.20 U	1.1	0.68	0.20 U	NA
Miscellaneous Parameters						
Alkalinity	MG/L	320	300	300	385	385
Biochemical Oxygen Demand (BOD)	MG/L	2.0 U	2.0 UJ	2.0 U	2.0 U	NA
Chemical Oxygen Demand (COD)	MG/L	12	4.2 J	10 U	10 U	NA
Chloride	MG/L	180	200	220	150	NA
Ferrous Iron	MG/L	0.01 U	1.05	0.97	0.01	0.12

Flags assigned during chemistry validation are shown.

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J-/J+ - The reported concentration is an estimated value, biased low/high.
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Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

Detection Limits shown are PQL

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TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW- 7B	MW-10A	MW-10B	MW-12B	MW-13B
Sample ID		MW-7B	MW-10A	MW-10B	MW-12B	MW-13B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/03/19	12/04/19	12/04/19	12/05/19	12/03/19
Parameter	Units					
Miscellaneous Parameters						
Hydrogen Sulfide	MG/L	2.0	0.1 U	0.10	0.1 U	0.1 U
Nitrate-Nitrogen	MG/L	0.25 U	0.25 U	0.25 U	0.25 U	NA
Sulfate (as SO4)	MG/L	190	150	260	240	NA
Sulfide	MG/L	7.1	1.0 U	1.0 U	1.0 U	NA
Total Organic Carbon (TOC)	MG/L	3.3	1.4	3.0	2.8	NA
BAV1 Vinyl Chloride Reductase	CELLS/ML	NA	0.50 U	4.5	NA	NA
Dehalobacter spp.	CELLS/ML	NA	5.0 U	5.3 U	NA	NA
Dehalococcoides spp.	CELLS/ML	NA	2.5	38.7	NA	NA
tceA Reductase	CELLS/ML	NA	1.4	573	NA	NA
Vinyl Chloride Reductase	CELLS/ML	NA	0.50 U	47.5	NA	NA

Flags assigned during chemistry validation are shown.

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J-/J+ - The reported concentration is an estimated value, biased low/high.
U - Not detected above the reported quantitation limit. UJ - Not detected. The reported quantitation limit is an estimated value.
Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

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Detection Limits shown are PQL

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW-14B	MW-16A	MW-16B	MW-17A	MW-17B
Sample ID		MW-14B	MW-16A	MW-16B	MW-17A	MW-17B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/05/19	12/03/19	12/03/19	12/05/19	12/05/19
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/L	1.0 U	4.0 U	1.0 U	2.0 U	1.0 U
1,1-Dichloroethane	UG/L	0.19 J	4.0 U	1.0 U	13	4.3
1,1-Dichloroethene	UG/L	1.0 U	4.0 U	1.0 U	2.0 U	1.0 U
1,2-Dichloroethene (cis)	UG/L	0.37 J	3.6 J	1.0	50	11
1,2-Dichloroethene (trans)	UG/L	1.0 U	4.0 U	1.0 U	2.0 U	0.28 J
Chloroethane	UG/L	1.0 U	4.0 U	1.0 U	2.0 U	6.6
Tetrachloroethene	UG/L	1.0 U	4.0 U	1.0 U	2.0 U	1.0 U
Trichloroethene	UG/L	1.0 U	0.60 J	1.0 U	2.0 U	1.0 U
Vinyl chloride	UG/L	0.70 J	120	6.7	83	14
Dissolved Gases						
Carbon Dioxide	MG/L	10	70	35	20	45
Ethane	UG/L	NA	1.0	4.2	11	24
Ethene	UG/L	NA	49	17	17	17
Methane	UG/L	NA	77	9,300 D	9,400 D	27,000 D
Propane	UG/L	NA	1.0 U	1.0 U	1.0 U	1.0 U
Dissolved Metals						
Iron, Dissolved	MG/L	NA	0.20 U	0.20 U	0.55	3.1
Miscellaneous Parameters						
Alkalinity	MG/L	180	770	770	440	770
Biochemical Oxygen Demand (BOD)	MG/L	NA	2.0 U	14	4.2	9.7 J-
Chemical Oxygen Demand (COD)	MG/L	NA	18	25	10 U	19
Chloride	MG/L	NA	170	110	57	140
Ferrous Iron	MG/L	0.64	0.15	0.08	0.55	1.35

Flags assigned during chemistry validation are shown.

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J-/J+ - The reported concentration is an estimated value, biased low/high.
U - Not detected above the reported quantitation limit. UJ - Not detected. The reported quantitation limit is an estimated value.
Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

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Detection Limits shown are PQL

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW-14B	MW-16A	MW-16B	MW-17A	MW-17B
Sample ID		MW-14B	MW-16A	MW-16B	MW-17A	MW-17B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		12/05/19	12/03/19	12/03/19	12/05/19	12/05/19
Parameter	Units					
Miscellaneous Parameters						
Hydrogen Sulfide	MG/L	0.1 U	0.1 U	2.0	0.1 U	5.0
Nitrate-Nitrogen	MG/L	NA	0.50 U	0.25 U	0.25 U	0.25 U
Sulfate (as SO4)	MG/L	NA	810	220	67	67
Sulfide	MG/L	NA	1.0 U	9.5	1.0 U	2.3
Total Organic Carbon (TOC)	MG/L	NA	6.1	4.0	2.8	5.9
BAV1 Vinyl Chloride Reductase	CELLS/ML	NA	NA	NA	NA	NA
Dehalobacter spp.	CELLS/ML	NA	NA	NA	NA	NA
Dehalococcoides spp.	CELLS/ML	NA	NA	NA	NA	NA
tceA Reductase	CELLS/ML	NA	NA	NA	NA	NA
Vinyl Chloride Reductase	CELLS/ML	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.
J-/J+ - The reported concentration is an estimated value, biased low/high.
U - Not detected above the reported quantitation limit. UJ - Not detected. The reported quantitation limit is an estimated value.
Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

Detection Limits shown are PQL

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW-18A	MW-18B	MW-18B	MW-19B
Sample ID		MW-18A	FD-120419	MW-18B	MW-19B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-
Date Sampled		12/04/19	12/04/19	12/04/19	12/04/19
Parameter	Units		Field Duplicate (1-1)		
Volatile Organic Compounds					
1,1,1-Trichloroethane	UG/L	2.0 U	NA	2.0 U	1.0 U
1,1-Dichloroethane	UG/L	3.6	NA	2.0 U	1.0 U
1,1-Dichloroethene	UG/L	0.93 J	NA	2.0 U	1.0 U
1,2-Dichloroethene (cis)	UG/L	43	NA	56	1.4
1,2-Dichloroethene (trans)	UG/L	0.66 J	NA	2.0 U	1.0 U
Chloroethane	UG/L	2.0 U	NA	2.0 U	1.0 U
Tetrachloroethene	UG/L	2.0 U	NA	2.0 U	1.0 U
Trichloroethene	UG/L	32	NA	2.0 U	1.0 U
Vinyl chloride	UG/L	0.97 J	NA	70	1.2
Dissolved Gases					
Carbon Dioxide	MG/L	30	NA	60	25
Ethane	UG/L	0.36 J	NA	2.3	NA
Ethene	UG/L	1.0 U	NA	9.9	NA
Methane	UG/L	9.2	NA	24,000 D	NA
Propane	UG/L	1.0 U	NA	1.0 U	NA
Dissolved Metals					
Iron, Dissolved	MG/L	0.90	NA	0.35	NA
Miscellaneous Parameters					
Alkalinity	MG/L	340	NA	400	320
Biochemical Oxygen Demand (BOD)	MG/L	2.0 U	NA	35 J-	NA
Chemical Oxygen Demand (COD)	MG/L	10 U	NA	49	NA
Chloride	MG/L	67	NA	96	NA
Ferrous Iron	MG/L	0.85	NA	0.36	0.14

Flags assigned during chemistry validation are shown.

J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.
J-/J+ - The reported concentration is an estimated value, biased low/high.
U - Not detected above the reported quantitation limit. UJ - Not detected. The reported quantitation limit is an estimated value.
Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

Detection Limits shown are PQL

J:\Projects\60481767_SP\PO\MISC\Hyde Park\600-CAD-GIS\650 Database\Program\EDMS.m
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[LOGDATE] >= #12/3/2019# AND [MATRIX] = 'WG

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		MW-18A	MW-18B	MW-18B	MW-19B
Sample ID		MW-18A	FD-120419	MW-18B	MW-19B
Matrix		Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-
Date Sampled		12/04/19	12/04/19	12/04/19	12/04/19
Parameter	Units		Field Duplicate (1-1)		
Miscellaneous Parameters					
Hydrogen Sulfide	MG/L	0.1 U	NA	5.0	0.70
Nitrate-Nitrogen	MG/L	0.25 U	NA	0.25 U	NA
Sulfate (as SO4)	MG/L	130	NA	130	NA
Sulfide	MG/L	1.0 U	NA	13	NA
Total Organic Carbon (TOC)	MG/L	1.3	NA	8.8	NA
BAV1 Vinyl Chloride Reductase	CELLS/ML	0.50 U	0.50 J	0.60 J	NA
Dehalobacter spp.	CELLS/ML	4.9 U	7.5 U	8.8 U	NA
Dehalococcoides spp.	CELLS/ML	1.3	159	272	NA
tceA Reductase	CELLS/ML	0.50 U	3.1	4.9	NA
Vinyl Chloride Reductase	CELLS/ML	0.50 U	71.9	115	NA

Flags assigned during chemistry validation are shown.

J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.
J-/J+ - The reported concentration is an estimated value, biased low/high.
U - Not detected above the reported quantitation limit. UJ - Not detected. The reported quantitation limit is an estimated value.
Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

Detection Limits shown are PQL

TABLE 2
VALIDATED FIELD QC SAMPLE ANALYTICAL RESULTS
FORMER CARBORUNDUM COMPLEX - SANBORN
HYDE PARK FACILITY

Location ID		FIELDQC	FIELDQC	FIELDQC
Sample ID		TRIP BLANK	TRIP BLANK-120418	TRIP BLANK-120519
Matrix		Water Quality	Water Quality	Water Quality
Depth Interval (ft)		-	-	-
Date Sampled		12/03/19	12/04/19	12/05/19
Parameter	Units	Trip Blank (1-1)	Trip Blank (1-1)	Trip Blank (1-1)
Volatile Organic Compounds				
1,1,1-Trichloroethane	UG/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	UG/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	UG/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	UG/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	UG/L	1.0 U	1.0 U	1.0 U
Chloroethane	UG/L	1.0 U	1.0 U	1.0 U
Tetrachloroethene	UG/L	1.0 U	1.0 U	1.0 U
Trichloroethene	UG/L	1.0 U	1.0 U	1.0 U
Vinyl chloride	UG/L	1.0 U	1.0 U	1.0 U

Flags assigned during chemistry validation are shown.

U - Not detected above the reported quantitation limit.

Made By_PRF_01/20/20_; Checked By_GEK 02/04/20_

Detection Limits shown are PQL

ATTACHMENT A

VALIDATED FORM 1s

Client Sample ID: MW-5A

Date Collected: 12/03/19 11:35
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/10/19 22:18	1
cis-1,2-Dichloroethene	9.5		1.0	0.16	ug/L			12/10/19 22:18	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/10/19 22:18	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/10/19 22:18	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/10/19 22:18	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/10/19 22:18	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/10/19 22:18	1
Trichloroethene	0.47	J	1.0	0.10	ug/L			12/10/19 22:18	1
Vinyl chloride	11		1.0	0.20	ug/L			12/10/19 22:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*12/10/19 22:18*	*1*
Dibromofluoromethane (Surr)	*82*		*78 - 129*		*12/10/19 22:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*12/10/19 22:18*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*12/10/19 22:18*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	140		1.0	0.17	ug/L			12/06/19 14:40	1
Ethane	2.1		1.0	0.29	ug/L			12/06/19 14:40	1
Ethylene	3.7		1.0	0.27	ug/L			12/06/19 14:40	1
Propane	ND		1.0	0.38	ug/L			12/06/19 14:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*12/06/19 14:40*	*1*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		200	26	ug/L		12/06/19 14:00	12/09/19 13:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	89		2.5	1.4	mg/L			12/04/19 22:54	5
Nitrate as N	0.59		0.25	0.13	mg/L			12/04/19 22:54	5
Sulfate	97		10	1.7	mg/L			12/04/19 22:54	5
Chemical Oxygen Demand	4.1	J	10	4.1	mg/L			12/10/19 09:20	1
Sulfide	ND		1.0	0.58	mg/L			12/06/19 14:20	1
Total Organic Carbon	0.68	J	1.0	0.14	mg/L			12/09/19 17:39	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/04/19 02:17	1

Client Sample ID: MW-5B

Date Collected: 12/03/19 10:05
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.0	1.7	ug/L			12/12/19 20:23	2
cis-1,2-Dichloroethene	32		2.0	0.32	ug/L			12/12/19 20:23	2
1,1-Dichloroethane	ND		2.0	0.34	ug/L			12/12/19 20:23	2
1,1-Dichloroethene	ND		2.0	0.38	ug/L			12/12/19 20:23	2
Tetrachloroethene	ND		2.0	0.30	ug/L			12/12/19 20:23	2

Client Sample ID: MW-5B

Date Collected: 12/03/19 10:05
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		2.0	0.38	ug/L			12/12/19 20:23	2
1,1,1-Trichloroethane	ND		2.0	0.48	ug/L			12/12/19 20:23	2
Trichloroethene	ND		2.0	0.20	ug/L			12/12/19 20:23	2
Vinyl chloride	90		2.0	0.40	ug/L			12/12/19 20:23	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*12/12/19 20:23*	*2*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*12/12/19 20:23*	*2*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*12/12/19 20:23*	*2*
Toluene-d8 (Surr)	*89*		*69 - 122*		*12/12/19 20:23*	*2*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	270		1.0	0.17	ug/L			12/06/19 14:57	1
Ethane	0.66	J	1.0	0.29	ug/L			12/06/19 14:57	1
Ethylene	4.8		1.0	0.27	ug/L			12/06/19 14:57	1
Propane	0.69	J	1.0	0.38	ug/L			12/06/19 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*89*		*60 - 140*		*12/06/19 14:57*	*1*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	410		200	26	ug/L		12/06/19 14:00	12/09/19 14:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	110		2.5	1.4	mg/L			12/04/19 23:08	5
Nitrate as N	ND		0.25	0.13	mg/L			12/04/19 23:08	5
Sulfate	240		10	1.7	mg/L			12/04/19 23:08	5
Chemical Oxygen Demand	9.4	J	10	4.1	mg/L			12/10/19 09:22	1
Sulfide	1.1	B	1.0	0.58	mg/L			12/06/19 14:20	1
Total Organic Carbon	3.3		1.0	0.14	mg/L			12/09/19 17:56	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/04/19 02:17	1

Client Sample ID: MW-7B

Date Collected: 12/03/19 14:15
Date Received: 12/03/19 16:45

1/21/20

Lab Sample ID: 480-163557-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/10/19 23:03	1
cis-1,2-Dichloroethene	1.3		1.0	0.16	ug/L			12/10/19 23:03	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/10/19 23:03	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/10/19 23:03	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/10/19 23:03	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/10/19 23:03	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/10/19 23:03	1
Trichloroethene	ND		1.0	0.10	ug/L			12/10/19 23:03	1
Vinyl chloride	10		1.0	0.20	ug/L			12/10/19 23:03	1

Client Sample ID: MW-7B

Date Collected: 12/03/19 14:15
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-3
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		47 - 134		12/10/19 23:03	1
Dibromofluoromethane (Surr)	84		78 - 129		12/10/19 23:03	1
1,2-Dichloroethane-d4 (Surr)	91		75 - 130		12/10/19 23:03	1
Toluene-d8 (Surr)	93		69 - 122		12/10/19 23:03	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	290		1.0	0.17	ug/L			12/06/19 15:14	1
Ethane	0.58	J	1.0	0.29	ug/L			12/06/19 15:14	1
Ethylene	3.3		1.0	0.27	ug/L			12/06/19 15:14	1
Propane	ND		1.0	0.38	ug/L			12/06/19 15:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	90		60 - 140		12/06/19 15:14	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		200	26	ug/L		12/06/19 14:00	12/09/19 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180		2.5	1.4	mg/L			12/04/19 23:22	5
Nitrate as N	ND		0.25	0.13	mg/L			12/04/19 23:22	5
Sulfate	190		10	1.7	mg/L			12/04/19 23:22	5
Chemical Oxygen Demand	12		10	4.1	mg/L			12/10/19 09:22	1
Sulfide	7.1	B	1.0	0.58	mg/L			12/06/19 14:20	1
Total Organic Carbon	3.3		1.0	0.14	mg/L			12/09/19 18:14	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/04/19 02:17	1

Client Sample ID: MW-13B

Date Collected: 12/03/19 12:05
Date Received: 12/03/19 16:45

1/21/20

Lab Sample ID: 480-163557-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/10/19 23:25	1
cis-1,2-Dichloroethene	16		1.0	0.16	ug/L			12/10/19 23:25	1
1,1-Dichloroethane	0.17	J	1.0	0.17	ug/L			12/10/19 23:25	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/10/19 23:25	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/10/19 23:25	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/10/19 23:25	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/10/19 23:25	1
Trichloroethene	0.19	J	1.0	0.10	ug/L			12/10/19 23:25	1
Vinyl chloride	21		1.0	0.20	ug/L			12/10/19 23:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		47 - 134		12/10/19 23:25	1
Dibromofluoromethane (Surr)	89		78 - 129		12/10/19 23:25	1
1,2-Dichloroethane-d4 (Surr)	97		75 - 130		12/10/19 23:25	1
Toluene-d8 (Surr)	98		69 - 122		12/10/19 23:25	1

Client Sample ID: MW-16A

Date Collected: 12/03/19 13:45
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		4.0	3.3	ug/L			12/12/19 20:46	4
cis-1,2-Dichloroethene	3.6	J	4.0	0.64	ug/L			12/12/19 20:46	4
1,1-Dichloroethane	ND		4.0	0.68	ug/L			12/12/19 20:46	4
1,1-Dichloroethene	ND		4.0	0.76	ug/L			12/12/19 20:46	4
Tetrachloroethene	ND		4.0	0.60	ug/L			12/12/19 20:46	4
trans-1,2-Dichloroethene	ND		4.0	0.76	ug/L			12/12/19 20:46	4
1,1,1-Trichloroethane	ND		4.0	0.96	ug/L			12/12/19 20:46	4
Trichloroethene	0.60	J	4.0	0.40	ug/L			12/12/19 20:46	4
Vinyl chloride	120		4.0	0.80	ug/L			12/12/19 20:46	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*12/12/19 20:46*	*4*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*12/12/19 20:46*	*4*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*12/12/19 20:46*	*4*
Toluene-d8 (Surr)	*93*		*69 - 122*		*12/12/19 20:46*	*4*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	77		1.0	0.17	ug/L			12/06/19 15:32	1
Ethane	1.0		1.0	0.29	ug/L			12/06/19 15:32	1
Ethylene	49		1.0	0.27	ug/L			12/06/19 15:32	1
Propane	ND		1.0	0.38	ug/L			12/06/19 15:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*12/06/19 15:32*	*1*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	~~130~~ J U		200	~~26~~ 130	ug/L		12/06/19 14:00	12/09/19 14:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	170		5.0	2.8	mg/L			12/04/19 23:36	10
Nitrate as N	ND		0.50	0.25	mg/L			12/04/19 23:36	10
Sulfate	810		20	3.5	mg/L			12/04/19 23:36	10
Chemical Oxygen Demand	18		10	4.1	mg/L			12/10/19 09:23	1
Sulfide	ND		1.0	0.58	mg/L			12/06/19 14:20	1
Total Organic Carbon	6.1		1.0	0.14	mg/L			12/09/19 18:31	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/04/19 02:17	1

1/21/20 AP

Client Sample ID: MW-16B

Date Collected: 12/03/19 15:25
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-6
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/11/19 00:11	1
cis-1,2-Dichloroethene	1.0		1.0	0.16	ug/L			12/11/19 00:11	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/11/19 00:11	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 00:11	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/11/19 00:11	1

Client Sample ID: MW-16B

Date Collected: 12/03/19 15:25
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-6
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 00:11	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/11/19 00:11	1
Trichloroethene	ND		1.0	0.10	ug/L			12/11/19 00:11	1
Vinyl chloride	6.7		1.0	0.20	ug/L			12/11/19 00:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*12/11/19 00:11*	*1*
Dibromofluoromethane (Surr)	*83*		*78 - 129*		*12/11/19 00:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*12/11/19 00:11*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*12/11/19 00:11*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	9300	D	5.0	0.87	ug/L			12/12/19 20:46	5
Ethane	4.2		1.0	0.29	ug/L			12/06/19 15:49	1
Ethylene	17		1.0	0.27	ug/L			12/06/19 15:49	1
Propane	ND		1.0	0.38	ug/L			12/06/19 15:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*88*		*60 - 140*		*12/06/19 15:49*	*1*
1,1,1-Trifluoroethane	*110*		*60 - 140*		*12/12/19 20:46*	*5*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	~~57~~ 57	~~J~~ U	200	~~26~~ 57	ug/L		12/06/19 14:00	12/09/19 14:31	1

1/21/20 m

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	110		2.5	1.4	mg/L			12/04/19 23:51	5
Nitrate as N	ND		0.25	0.13	mg/L			12/04/19 23:51	5
Sulfate	220		10	1.7	mg/L			12/04/19 23:51	5
Chemical Oxygen Demand	25		10	4.1	mg/L			12/10/19 09:23	1
Sulfide	9.5	B	1.0	0.58	mg/L			12/06/19 14:20	1
Total Organic Carbon	4.0		1.0	0.14	mg/L			12/09/19 19:26	1
Biochemical Oxygen Demand	14		6.0	6.0	mg/L			12/04/19 02:17	1

Client Sample ID: FD-120319 (MW-5A)

Date Collected: 12/03/19 00:00
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/11/19 00:33	1
cis-1,2-Dichloroethene	10		1.0	0.16	ug/L			12/11/19 00:33	1
1,1-Dichloroethane	0.17	J	1.0	0.17	ug/L			12/11/19 00:33	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 00:33	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/11/19 00:33	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 00:33	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/11/19 00:33	1
Trichloroethene	0.40	J	1.0	0.10	ug/L			12/11/19 00:33	1
Vinyl chloride	13		1.0	0.20	ug/L			12/11/19 00:33	1

Client Sample ID: FD-120319

Date Collected: 12/03/19 00:00
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-7
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		47 - 134		12/11/19 00:33	1
Dibromofluoromethane (Surr)	86		78 - 129		12/11/19 00:33	1
1,2-Dichloroethane-d4 (Surr)	92		75 - 130		12/11/19 00:33	1
Toluene-d8 (Surr)	92		69 - 122		12/11/19 00:33	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	160		1.0	0.17	ug/L			12/06/19 16:06	1
Ethane	2.4		1.0	0.29	ug/L			12/06/19 16:06	1
Ethylene	4.3		1.0	0.27	ug/L			12/06/19 16:06	1
Propane	ND		1.0	0.38	ug/L			12/06/19 16:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	90		60 - 140		12/06/19 16:06	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		200	26	ug/L		12/06/19 14:00	12/09/19 14:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	89		2.5	1.4	mg/L			12/05/19 00:05	5
Nitrate as N	0.59		0.25	0.13	mg/L			12/05/19 00:05	5
Sulfate	98		10	1.7	mg/L			12/05/19 00:05	5
Chemical Oxygen Demand	ND		10	4.1	mg/L			12/10/19 09:24	1
Sulfide	1.1	B	1.0	0.58	mg/L			12/06/19 14:20	1
Total Organic Carbon	0.64	J	1.0	0.14	mg/L			12/09/19 19:44	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/04/19 02:17	1

Client Sample ID: TRIP BLANK

1/21/20

Date Collected: 12/03/19 00:00
Date Received: 12/03/19 16:45

Lab Sample ID: 480-163557-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/11/19 00:56	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			12/11/19 00:56	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/11/19 00:56	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 00:56	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/11/19 00:56	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 00:56	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/11/19 00:56	1
Trichloroethene	ND		1.0	0.10	ug/L			12/11/19 00:56	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/11/19 00:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		47 - 134		12/11/19 00:56	1
Dibromofluoromethane (Surr)	85		78 - 129		12/11/19 00:56	1
1,2-Dichloroethane-d4 (Surr)	93		75 - 130		12/11/19 00:56	1
Toluene-d8 (Surr)	92		69 - 122		12/11/19 00:56	1

Client Sample ID: MW-10A

Date Collected: 12/04/19 11:07
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		25	21	ug/L			12/11/19 01:18	25
cis-1,2-Dichloroethene	**500**		25	4.0	ug/L			12/11/19 01:18	25
1,1-Dichloroethane	ND		25	4.3	ug/L			12/11/19 01:18	25
1,1-Dichloroethene	ND		25	4.8	ug/L			12/11/19 01:18	25
Tetrachloroethene	ND		25	3.8	ug/L			12/11/19 01:18	25
trans-1,2-Dichloroethene	ND		25	4.8	ug/L			12/11/19 01:18	25
1,1,1-Trichloroethane	ND		25	6.0	ug/L			12/11/19 01:18	25
Trichloroethene	**5.0**	J	25	2.5	ug/L			12/11/19 01:18	25
Vinyl chloride	**130**		25	5.0	ug/L			12/11/19 01:18	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*12/11/19 01:18*	*25*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*12/11/19 01:18*	*25*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*		*12/11/19 01:18*	*25*
Toluene-d8 (Surr)	*92*		*69 - 122*		*12/11/19 01:18*	*25*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**2000**		1.0	0.17	ug/L			12/13/19 00:27	1
Ethane	**2.4**		1.0	0.29	ug/L			12/13/19 00:27	1
Ethylene	**36**		1.0	0.27	ug/L			12/13/19 00:27	1
Propane	ND		1.0	0.38	ug/L			12/13/19 00:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*105*		*60 - 140*		*12/13/19 00:27*	*1*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**1100**		200	26	ug/L		12/10/19 14:00	12/12/19 17:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**		2.5	1.4	mg/L			12/05/19 10:44	5
Nitrate as N	ND		0.25	0.13	mg/L			12/05/19 10:44	5
Sulfate	**150**		10	1.7	mg/L			12/05/19 10:44	5
Chemical Oxygen Demand	**4.2**	J	10	4.1	mg/L			12/12/19 10:49	1
Sulfide	ND		1.0	0.58	mg/L			12/09/19 14:44	1
Total Organic Carbon	**1.4**		1.0	0.14	mg/L			12/09/19 20:02	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/06/19 08:53	1

Client Sample ID: MW-10B

Date Collected: 12/04/19 09:58
Date Received: 12/04/19 16:35

1/21/20

Lab Sample ID: 480-163616-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		20	17	ug/L			12/11/19 01:40	20
cis-1,2-Dichloroethene	**420**		20	3.2	ug/L			12/11/19 01:40	20
1,1-Dichloroethane	ND		20	3.4	ug/L			12/11/19 01:40	20
1,1-Dichloroethene	ND		20	3.8	ug/L			12/11/19 01:40	20
Tetrachloroethene	ND		20	3.0	ug/L			12/11/19 01:40	20

Client Sample ID: MW-10B

Date Collected: 12/04/19 09:58
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	4.0	J	20	3.8	ug/L			12/11/19 01:40	20
1,1,1-Trichloroethane	ND		20	4.8	ug/L			12/11/19 01:40	20
Trichloroethene	ND		20	2.0	ug/L			12/11/19 01:40	20
Vinyl chloride	180		20	4.0	ug/L			12/11/19 01:40	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*12/11/19 01:40*	*20*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*12/11/19 01:40*	*20*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*12/11/19 01:40*	*20*
Toluene-d8 (Surr)	*94*		*69 - 122*		*12/11/19 01:40*	*20*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	1500		1.0	0.17	ug/L			12/13/19 00:44	1
Ethane	1.8		1.0	0.29	ug/L			12/13/19 00:44	1
Ethylene	27		1.0	0.27	ug/L			12/13/19 00:44	1
Propane	4.1		1.0	0.38	ug/L			12/13/19 00:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*106*		*60 - 140*		*12/13/19 00:44*	*1*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	680		200	26	ug/L		12/10/19 14:00	12/12/19 17:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	220		2.5	1.4	mg/L			12/05/19 10:58	5
Nitrate as N	ND		0.25	0.13	mg/L			12/05/19 10:58	5
Sulfate	260		10	1.7	mg/L			12/05/19 10:58	5
Chemical Oxygen Demand	ND		10	4.1	mg/L			12/12/19 10:50	1
Sulfide	ND		1.0	0.58	mg/L			12/09/19 14:50	1
Total Organic Carbon	3.0		1.0	0.14	mg/L			12/09/19 20:20	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/06/19 08:47	1

Client Sample ID: MW-18A

Date Collected: 12/04/19 09:50
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.0	1.7	ug/L			12/11/19 02:03	2
cis-1,2-Dichloroethene	43		2.0	0.32	ug/L			12/11/19 02:03	2
1,1-Dichloroethane	3.6		2.0	0.34	ug/L			12/11/19 02:03	2
1,1-Dichloroethene	0.93	J	2.0	0.38	ug/L			12/11/19 02:03	2
Tetrachloroethene	ND		2.0	0.30	ug/L			12/11/19 02:03	2
trans-1,2-Dichloroethene	0.66	J	2.0	0.38	ug/L			12/11/19 02:03	2
1,1,1-Trichloroethane	ND		2.0	0.48	ug/L			12/11/19 02:03	2
Trichloroethene	32		2.0	0.20	ug/L			12/11/19 02:03	2
Vinyl chloride	0.97	J	2.0	0.40	ug/L			12/11/19 02:03	2

Client Sample ID: MW-18A

Date Collected: 12/04/19 09:50
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-3
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*12/11/19 02:03*	*2*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*12/11/19 02:03*	*2*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*12/11/19 02:03*	*2*
Toluene-d8 (Surr)	*92*		*69 - 122*		*12/11/19 02:03*	*2*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	9.2		1.0	0.17	ug/L			12/13/19 01:01	1
Ethane	0.36	J	1.0	0.29	ug/L			12/13/19 01:01	1
Ethylene	ND		1.0	0.27	ug/L			12/13/19 01:01	1
Propane	ND		1.0	0.38	ug/L			12/13/19 01:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*99*		*60 - 140*		*12/13/19 01:01*	*1*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	900		200	26	ug/L		12/10/19 14:00	12/12/19 17:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	67		2.5	1.4	mg/L			12/05/19 11:12	5
Nitrate as N	ND		0.25	0.13	mg/L			12/05/19 11:12	5
Sulfate	130		10	1.7	mg/L			12/05/19 11:12	5
Chemical Oxygen Demand	ND		10	4.1	mg/L			12/12/19 10:50	1
Sulfide	ND		1.0	0.58	mg/L			12/09/19 14:56	1
Total Organic Carbon	1.3		1.0	0.14	mg/L			12/09/19 20:37	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/06/19 08:47	1

Client Sample ID: MW-18B

Date Collected: 12/04/19 11:45
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.0	1.7	ug/L			12/11/19 02:25	2
cis-1,2-Dichloroethene	56		2.0	0.32	ug/L			12/11/19 02:25	2
1,1-Dichloroethane	ND		2.0	0.34	ug/L			12/11/19 02:25	2
1,1-Dichloroethene	ND		2.0	0.38	ug/L			12/11/19 02:25	2
Tetrachloroethene	ND		2.0	0.30	ug/L			12/11/19 02:25	2
trans-1,2-Dichloroethene	ND		2.0	0.38	ug/L			12/11/19 02:25	2
1,1,1-Trichloroethane	ND		2.0	0.48	ug/L			12/11/19 02:25	2
Trichloroethene	ND		2.0	0.20	ug/L			12/11/19 02:25	2
Vinyl chloride	70		2.0	0.40	ug/L			12/11/19 02:25	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*12/11/19 02:25*	*2*
Dibromofluoromethane (Surr)	*82*		*78 - 129*		*12/11/19 02:25*	*2*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*12/11/19 02:25*	*2*
Toluene-d8 (Surr)	*90*		*69 - 122*		*12/11/19 02:25*	*2*

Client Sample ID: MW-18B

Date Collected: 12/04/19 11:45
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-4
Matrix: Water

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	24000	D	10	1.7	ug/L			12/13/19 17:32	10
Ethane	2.3		1.0	0.29	ug/L			12/13/19 01:17	1
Ethylene	9.9		1.0	0.27	ug/L			12/13/19 01:17	1
Propane	ND		1.0	0.38	ug/L			12/13/19 01:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*104*		*60 - 140*		*12/13/19 01:17*	*1*
1,1,1-Trifluoroethane	*106*		*60 - 140*		*12/13/19 17:32*	*10*

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	350		200	26	ug/L		12/10/19 14:00	12/12/19 17:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	96		2.5	1.4	mg/L			12/05/19 11:27	5
Nitrate as N	ND		0.25	0.13	mg/L			12/05/19 11:27	5
Sulfate	130		10	1.7	mg/L			12/05/19 11:27	5
Chemical Oxygen Demand	49		10	4.1	mg/L			12/12/19 10:51	1
Sulfide	13		1.0	0.58	mg/L			12/09/19 15:02	1
Total Organic Carbon	8.8		2.0	0.28	mg/L			12/09/19 20:56	2
Biochemical Oxygen Demand	35	~~b~~ J-	12	12	mg/L			12/06/19 08:53	1

Client Sample ID: MW-7A

Date Collected: 12/04/19 12:35
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	44		2.5	2.1	ug/L			12/10/19 19:41	2.5
cis-1,2-Dichloroethene	21	~~F1~~ J	2.5	0.40	ug/L			12/10/19 19:41	2.5
1,1-Dichloroethane	69		2.5	0.43	ug/L			12/10/19 19:41	2.5
1,1-Dichloroethene	ND		2.5	0.48	ug/L			12/10/19 19:41	2.5
Tetrachloroethene	ND		2.5	0.38	ug/L			12/10/19 19:41	2.5
trans-1,2-Dichloroethene	ND		2.5	0.48	ug/L			12/10/19 19:41	2.5
1,1,1-Trichloroethane	ND		2.5	0.60	ug/L			12/10/19 19:41	2.5
Trichloroethene	ND		2.5	0.25	ug/L			12/10/19 19:41	2.5
Vinyl chloride	35	~~F1~~ J	2.5	0.50	ug/L			12/10/19 19:41	2.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*12/10/19 19:41*	*2.5*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*12/10/19 19:41*	*2.5*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*12/10/19 19:41*	*2.5*
Toluene-d8 (Surr)	*94*		*69 - 122*		*12/10/19 19:41*	*2.5*

1/21/20

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	13000	D	10	1.7	ug/L			12/17/19 13:04	10
Ethane	95		1.0	0.29	ug/L			12/13/19 02:08	1
Ethylene	25		1.0	0.27	ug/L			12/13/19 02:08	1
Propane	ND		1.0	0.38	ug/L			12/13/19 02:08	1

Client Sample ID: MW-7A

Date Collected: 12/04/19 12:35
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-5
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	103		60 - 140		12/13/19 02:08	1
1,1,1-Trifluoroethane	112		60 - 140		12/17/19 13:04	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1500		200	26	ug/L		12/10/19 14:00	12/12/19 17:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12		2.5	1.4	mg/L			12/05/19 11:41	5
Nitrate as N	ND		0.25	0.13	mg/L			12/05/19 11:41	5
Sulfate	70		10	1.7	mg/L			12/05/19 11:41	5
Chemical Oxygen Demand	42		10	4.1	mg/L			12/12/19 10:42	1
Sulfide	ND		1.0	0.58	mg/L			12/09/19 15:08	1
Total Organic Carbon	17		1.0	0.14	mg/L			12/09/19 16:43	1
Biochemical Oxygen Demand	14 ~~B*~~ J-		6.0	6.0	mg/L			12/06/19 08:53	1

Client Sample ID: MW-6

Date Collected: 12/04/19 13:55
Date Received: 12/04/19 16:35

1/21/20

Lab Sample ID: 480-163616-6
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/11/19 02:48	1
cis-1,2-Dichloroethene	10		1.0	0.16	ug/L			12/11/19 02:48	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/11/19 02:48	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 02:48	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/11/19 02:48	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 02:48	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/11/19 02:48	1
Trichloroethene	ND		1.0	0.10	ug/L			12/11/19 02:48	1
Vinyl chloride	78		1.0	0.20	ug/L			12/11/19 02:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	83		47 - 134		12/11/19 02:48	1
Dibromofluoromethane (Surr)	82		78 - 129		12/11/19 02:48	1
1,2-Dichloroethane-d4 (Surr)	87		75 - 130		12/11/19 02:48	1
Toluene-d8 (Surr)	87		69 - 122		12/11/19 02:48	1

Client Sample ID: TRIP BLANK-120418

Date Collected: 12/04/19 00:00
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/11/19 03:10	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			12/11/19 03:10	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/11/19 03:10	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 03:10	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/11/19 03:10	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 03:10	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/11/19 03:10	1

Client Sample ID: TRIP BLANK-120418
Date Collected: 12/04/19 00:00
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	ND		1.0	0.10	ug/L			12/11/19 03:10	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/11/19 03:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*12/11/19 03:10*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*12/11/19 03:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*12/11/19 03:10*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*12/11/19 03:10*	*1*

Client Sample ID: MW-19B
Date Collected: 12/04/19 15:37
Date Received: 12/04/19 16:35

Lab Sample ID: 480-163616-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/11/19 03:33	1
cis-1,2-Dichloroethene	**1.4**		1.0	0.16	ug/L			12/11/19 03:33	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/11/19 03:33	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 03:33	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/11/19 03:33	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/11/19 03:33	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/11/19 03:33	1
Trichloroethene	ND		1.0	0.10	ug/L			12/11/19 03:33	1
Vinyl chloride	**1.2**		1.0	0.20	ug/L			12/11/19 03:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*12/11/19 03:33*	*1*
Dibromofluoromethane (Surr)	*83*		*78 - 129*		*12/11/19 03:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*12/11/19 03:33*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*12/11/19 03:33*	*1*

Client Sample Results

Client: AECOM
Project/Site: BP Hyde Park

Job ID: 480-163684-1

Client Sample ID: MW-12B

Date Collected: 12/05/19 10:15
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.5	2.1	ug/L			12/14/19 01:54	2.5
cis-1,2-Dichloroethene	65		2.5	0.40	ug/L			12/14/19 01:54	2.5
1,1-Dichloroethane	ND		2.5	0.43	ug/L			12/14/19 01:54	2.5
1,1-Dichloroethene	ND		2.5	0.48	ug/L			12/14/19 01:54	2.5
Tetrachloroethene	ND		2.5	0.38	ug/L			12/14/19 01:54	2.5
trans-1,2-Dichloroethene	ND		2.5	0.48	ug/L			12/14/19 01:54	2.5
1,1,1-Trichloroethane	ND		2.5	0.60	ug/L			12/14/19 01:54	2.5
Trichloroethene	ND		2.5	0.25	ug/L			12/14/19 01:54	2.5
Vinyl chloride	94		2.5	0.50	ug/L			12/14/19 01:54	2.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*12/14/19 01:54*	*2.5*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*12/14/19 01:54*	*2.5*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*12/14/19 01:54*	*2.5*
Toluene-d8 (Surr)	*95*		*69 - 122*		*12/14/19 01:54*	*2.5*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	210		1.0	0.17	ug/L			12/13/19 21:47	1
Ethane	0.89	J	1.0	0.29	ug/L			12/13/19 21:47	1
Ethylene	5.3		1.0	0.27	ug/L			12/13/19 21:47	1
Propane	1.2		1.0	0.38	ug/L			12/13/19 21:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*104*		*60 - 140*		*12/13/19 21:47*	*1*

1/23/20 A

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	~~71~~ ND	~~J B~~ U	200	~~28~~ 71	ug/L		12/12/19 14:00	12/13/19 16:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		2.5	1.4	mg/L			12/07/19 00:01	5
Nitrate as N	ND		0.25	0.13	mg/L			12/07/19 00:01	5
Sulfate	240		10	1.7	mg/L			12/10/19 14:45	5
Chemical Oxygen Demand	ND		10	4.1	mg/L			12/13/19 10:40	1
Sulfide	ND		1.0	0.58	mg/L			12/12/19 10:12	1
Total Organic Carbon	2.8		1.0	0.14	mg/L			12/13/19 23:01	1
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			12/07/19 06:20	1

Client Sample ID: MW-14B

Date Collected: 12/05/19 10:10
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/14/19 02:16	1
cis-1,2-Dichloroethene	0.37	J	1.0	0.16	ug/L			12/14/19 02:16	1
1,1-Dichloroethane	0.19	J	1.0	0.17	ug/L			12/14/19 02:16	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/14/19 02:16	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/14/19 02:16	1

Client Sample ID: MW-14B

Date Collected: 12/05/19 10:10
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/14/19 02:16	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/14/19 02:16	1
Trichloroethene	ND		1.0	0.10	ug/L			12/14/19 02:16	1
Vinyl chloride	0.70	J	1.0	0.20	ug/L			12/14/19 02:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*12/14/19 02:16*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*12/14/19 02:16*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*12/14/19 02:16*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*12/14/19 02:16*	*1*

Client Sample ID: MW-17A

Date Collected: 12/05/19 12:05
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.0	1.7	ug/L			12/16/19 19:05	2
cis-1,2-Dichloroethene	50		2.0	0.32	ug/L			12/16/19 19:05	2
1,1-Dichloroethane	13		2.0	0.34	ug/L			12/16/19 19:05	2
1,1-Dichloroethene	ND		2.0	0.38	ug/L			12/16/19 19:05	2
Tetrachloroethene	ND		2.0	0.30	ug/L			12/16/19 19:05	2
trans-1,2-Dichloroethene	ND		2.0	0.38	ug/L			12/16/19 19:05	2
1,1,1-Trichloroethane	ND		2.0	0.48	ug/L			12/16/19 19:05	2
Trichloroethene	ND		2.0	0.20	ug/L			12/16/19 19:05	2
Vinyl chloride	83		2.0	0.40	ug/L			12/16/19 19:05	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*12/16/19 19:05*	*2*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*12/16/19 19:05*	*2*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*12/16/19 19:05*	*2*
Toluene-d8 (Surr)	*97*		*69 - 122*		*12/16/19 19:05*	*2*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	9400	D	10	1.7	ug/L			12/16/19 14:25	10
Ethane	11		1.0	0.29	ug/L			12/13/19 22:04	1
Ethylene	17		1.0	0.27	ug/L			12/13/19 22:04	1
Propane	ND		1.0	0.38	ug/L			12/13/19 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*104*		*60 - 140*		*12/13/19 22:04*	*1*
1,1,1-Trifluoroethane	*110*		*60 - 140*		*12/16/19 14:25*	*10*

1/23/20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	550	B	200	26	ug/L		12/12/19 14:00	12/13/19 16:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	57		2.5	1.4	mg/L			12/07/19 00:15	5

Client Sample ID: MW-17A

Date Collected: 12/05/19 12:05
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-3
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.25	0.13	mg/L			12/07/19 00:15	5
Sulfate	67		10	1.7	mg/L			12/10/19 14:53	5
Chemical Oxygen Demand	ND		10	4.1	mg/L			12/13/19 10:42	1
Sulfide	ND		1.0	0.58	mg/L			12/12/19 10:12	1
Total Organic Carbon	2.8		1.0	0.14	mg/L			12/13/19 21:04	1
Biochemical Oxygen Demand	4.2	b	2.0	2.0	mg/L			12/07/19 06:20	1

Client Sample ID: MW-17B

Date Collected: 12/05/19 13:50
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	6.6		1.0	0.83	ug/L			12/14/19 02:39	1
cis-1,2-Dichloroethene	11		1.0	0.16	ug/L			12/14/19 02:39	1
1,1-Dichloroethane	4.3		1.0	0.17	ug/L			12/14/19 02:39	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/14/19 02:39	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/14/19 02:39	1
trans-1,2-Dichloroethene	0.28	J	1.0	0.19	ug/L			12/14/19 02:39	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/14/19 02:39	1
Trichloroethene	ND		1.0	0.10	ug/L			12/14/19 02:39	1
Vinyl chloride	14		1.0	0.20	ug/L			12/14/19 02:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*12/14/19 02:39*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*12/14/19 02:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*12/14/19 02:39*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*12/14/19 02:39*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	27000	D	10	1.7	ug/L			12/16/19 14:42	10
Ethane	24		1.0	0.29	ug/L			12/13/19 22:21	1
Ethylene	17		1.0	0.27	ug/L			12/13/19 22:21	1
Propane	ND		1.0	0.38	ug/L			12/13/19 22:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*103*		*60 - 140*		*12/13/19 22:21*	*1*
1,1,1-Trifluoroethane	*113*		*60 - 140*		*12/16/19 14:42*	*10*

1/23/20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	3100	B	200	26	ug/L		12/12/19 14:00	12/13/19 16:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		2.5	1.4	mg/L			12/07/19 00:30	5
Nitrate as N	ND		0.25	0.13	mg/L			12/07/19 00:30	5
Sulfate	67		10	1.7	mg/L			12/10/19 15:01	5
Chemical Oxygen Demand	19		10	4.1	mg/L			12/13/19 10:43	1
Sulfide	2.3		1.0	0.58	mg/L			12/12/19 10:12	1

Client Sample ID: MW-17B
Date Collected: 12/05/19 13:50
Date Received: 12/05/19 15:45

Lab Sample ID: 480-163684-4
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	5.9		1.0	0.14	mg/L			12/14/19 04:33	1
Biochemical Oxygen Demand	9.7	J-	2.0	2.0	mg/L			12/07/19 11:31	1

Client Sample ID: TRIP BLANK-120519
Date Collected: 12/05/19 00:00
Date Received: 12/05/19 15:45

1/23/20

Lab Sample ID: 480-163684-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.83	ug/L			12/14/19 03:01	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			12/14/19 03:01	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			12/14/19 03:01	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			12/14/19 03:01	1
Tetrachloroethene	ND		1.0	0.15	ug/L			12/14/19 03:01	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			12/14/19 03:01	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			12/14/19 03:01	1
Trichloroethene	ND		1.0	0.10	ug/L			12/14/19 03:01	1
Vinyl chloride	ND		1.0	0.20	ug/L			12/14/19 03:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*12/14/19 03:01*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*12/14/19 03:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*12/14/19 03:01*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*12/14/19 03:01*	*1*

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **AECOM**
Project: BP-IPO Hyde Park Blvd

MI Project Number: **012QL**
Date Received: 12/05/2019

Sample Information

Client Sample ID:		**MW-10A**	**MW-10B**	**MW-18A**	**MW-18B**	**MW-7A**
Sample Date:		12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		CB	CB	CB	CB	CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.50E+00**	**3.87E+01**	**1.30E+00**	**2.72E+02**	**2.30E+03**
tceA Reductase	TCE	**1.40E+00**	**5.73E+02**	<5.00E-01	**4.90E+00**	**2.03E+02**
BAV1 Vinyl Chloride Reductase	BVC	<5.00E-01	**4.50E+00**	<5.00E-01	**6.00E-01 (J)**	**2.41E+02**
Vinyl Chloride Reductase	VCR	<5.00E-01	**4.75E+01**	<5.00E-01	**1.15E+02**	**9.46E+02**
Dehalobacter spp.	*DHBt*	<5.00E+00	<5.30E+00	<4.90E+00	<8.80E+00	<2.17E+01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **AECOM**
Project: BP-IPO Hyde Park Blvd

MI Project Number: **012QL**
Date Received: 12/05/2019

Sample Information

Client Sample ID:		MW-6	FD-120419 (MW-18B)
Sample Date:		12/04/2019	12/04/2019
Units:		cells/mL	cells/mL
Analyst/Reviewer:		CB	CB

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**2.13E+01**	**1.59E+02**
tceA Reductase	TCE	**<5.00E-01**	**3.10E+00**
BAV1 Vinyl Chloride Reductase	BVC	**<5.00E-01**	**5.00E-01 (J)**
Vinyl Chloride Reductase	VCR	**7.70E+00**	**7.19E+01**
Dehalobacter spp.	*DHBt*	**<4.90E+00**	**<7.50E+00**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

ATTACHMENT B

SUPPORT DOCUMENTATION

Laboratory Management Program LaMP Chain of Custody Record

Page ____ of ____

BP/ARC Project Name: BP IPO

BP/ARC Facility No: BP Hyde Park

Req Due Date (mm/dd/yy): ______

Rush TAT: Yes ___ No X

Lab Work Order Number: ______

Lab Name	Test America (Canton, OH)	BP/ARC Facility Address	3425 Hyde Park Blvd	Consultant/Contractor	AECOM
Lab Address	4101 Shuffel Street NW, North Canton, OH 44720	City, State, ZIP Code	Niagara, NY 14305	Consultant/Contractor Project No	60481767.17.14
Lab PM	Lab Contact: Amy McCormick	Lead Regulatory Agency	NYSDEC	Address	257 West Genesee St., Suite 400 Buffalo, NY 14202
Lab Phone	330-497-9396 / 330-497-0772	California Global ID No		Consultant/Contractor PM	James Kaczor
Lab Shipping Accnt		Enfos Proposal No		Phone	716-923-1300
Lab Bottle Order No		Accounting Mode	Provision ___ OOC-BU ___ OOC-RM ___	Email EDD To	James.Kaczor@aecom.com
Other Info		Stage	Activity	Invoice To	BP/ARC ___ Contractor X
BP/ARC EBM					
EBM Phone					
EBM Email					

Report Type & QC Level: Standard ___ Full Data Package ___

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor		Total Number of Containers	Unpreserved	HNO3	HCl	NaOH/Zn-acetate	H2SO4		8260C - VOCs	SM-4500_S2_F -Sulfide	410.4 - COD	RSK 175 - Dissolved Gases	5310 C - TOC	5210-BOD (TA-Buffalo)	300, 300.0_28D (TA - Buffalo)	6010C - Dissolved Iron (field filtered)			Comments
	MW-5A	12-3-19	1135		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X			
	MW-5B	12-3-19	1005		X			13	[illegible]	1	6	1	3		X	X	X	X	X	X	X	X			
	MW-7B	12-3-19	1415		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X			
	MW-13B	12-3-19	1305		X			3			3				X										
	MW-16A	12-3-19	1345		X			3	2	1	6	1	3		X	X	X	X	X	X	X	X			
	MW-16B	12-3-19	1525					13	2	1	6	1	3		X	X	X	X	X	X	X	X		PF	
	FD 120319	12-3-19	—		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X			
	TRIP BLANK	12-3-19	—		X			3			3				X										

Comments: Note: If sample not collected, indicate "No Sample" ... single strike out and ... the description

480-163557 Chain of Custody

Sampler's Name	Emily AJ
Sampler's Company	AECOM
Shipment Method	Dropoff at TA Buffalo, NY — Ship Date
Shipment Tracking No	

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
[signature] AECOM	12/3/19	1645	[signature]	12/3/19	1645

Special Instructions: PO #93607 Line 2: TA Buffalo to ship to TA Canton except short hold bottles 5210-BOD, 300,300.0_28D :

THIS LINE - LAB USE ONLY Custody Seals In Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt [illegible] °F/C | Trip Blank Yes / No | MS/MSD Sample Submitted Yes / No

BP/ARC LaMP COC Rev. 6 01/01 2009

Eurofins TestAmerica, Buffalo

10 Hazelwood Drive
Amherst NY 14228-2298
Phone 716-691-2600 Fax 716-691-7991

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)

Client Contact: Shipping/Receiving
Company: TestAmerica Laboratories Inc
Address: 4101 Shuffel Street NW,
City: North Canton
State Zip: OH 44720
Phone: 330-497-9396(Tel) 330-497-0772(Fax)
Email:
Project Name: BP Hyde Park
Site:

Sampler:
Phone:
Due Date Requested: 12/16/2019
TAT Requested (days):
PO #:
WO #:
Project #: 24018856
SSOW#:

Lab PM: Johnson, Opal
E-Mail: opal.johnson@testamericainc.com
Accreditations Required (See note): NELAP - New York
Carrier Tracking No(s):
State of Origin: New York

COC No: 480-53486.1
Page: Page 1 of 1
Job #: 480-163557-1

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA
M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C/5030C (MOD) TCL OLM03 1/4.2 Volatile Analyte L	6010C/FIELD_FLTRD (MOD) Custom Sublist	410.4	5310C/ TOC	RSK_175/ (MOD) MEE Only	SM4500_S2_F/ (MOD) Local Method	Total Number of containers	Special Instructions/Note: RSK MS 585
			Preservation Code:											
MW-5A (480-163557-1)	12/3/19	11:35 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-5B (480-163557-2)	12/3/19	10:05 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-7B (480-163557-3)	12/3/19	14:15 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-16A (480-163557-5)	12/3/19	13:45 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-16B (480-163557-6)	12/3/19	15:25 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
FD-120319 (480-163557-7)	12/3/19	Eastern		Water			X	X	X	X	X	X	11	BP LaMP

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 2
Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	12/04/19 1700	TA	[signature]	12-5-19 1000	EFA

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

4 3/5 C

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler	Lab PM: Johnson, Opal	Carrier Tracking No(s)	COC No: 480-53486.1
Client Contact: Shipping/Receiving	Phone	E-Mail: opal.johnson@testamericainc.com	State of Origin: New York	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): NELAP - New York		Job #: 480-163557-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 12/16/2019			Preservation Codes:
City: North Canton	TAT Requested (days):			A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #			
Email:	WO #			Other:
Project Name: BP Hyde Park	Project #: 24018856			
Site:	SSOW#			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C/5030C (MOD) TCL OLM03.1/4.2 Volatile Analyte L	Total Number of containers	Special Instructions/Note:
			Preservation Code						MS
MW-13B (480-163557-4)	12/3/19	12:05 Eastern		Water			X	3	BP LaMP
TRIP BLANK (480-163557-8)	12/3/19	Eastern		Water			X	3	BP LaMP

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment
Relinquished by: [signature]	Date/Time: 12/4/19 1746	Company: TA	Received by: [signature] Date/Time: 12-5-19 1000 Company: EPA
Relinquished by	Date/Time	Company	Received by / Date/Time / Company
Relinquished by	Date/Time	Company	Received by / Date/Time / Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks

Ver: 01/16/2019

CASE NARRATIVE

Client: AECOM

Project: BP Hyde Park

Report Number: 480-163557-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 12/3/2019 4:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.0° C and 2.2° C.

The tests were not selected on the COC for sample MW-16B. Sample analyses were logged per containers received.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-13B (480-163557-4), MW-16A (480-163557-5), MW-16B (480-163557-6), FD-120319 (480-163557-7) and TRIP BLANK (480-163557-8) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 12/10/2019, 12/11/2019 and 12/12/2019.

Samples MW-5B (480-163557-2)[2X] and MW-16A (480-163557-5)[4X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES

Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for dissolved gases in accordance with RSK_175. The samples were analyzed on 12/06/2019 and 12/12/2019.

Sample MW-16B (480-163557-6)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED METALS (ICP)

Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/06/2019 and analyzed on 12/09/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS
Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 12/04/2019 and 12/05/2019.

Samples MW-5A (480-163557-1)[5X], MW-5B (480-163557-2)[5X], MW-7B (480-163557-3)[5X], MW-16A (480-163557-5)[10X], MW-16B (480-163557-6)[5X] and FD-120319 (480-163557-7)[5X] required dilution prior to analysis to bring the concentration of target analytes within the calibration range. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS
Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 12/04/2019 and 12/05/2019.

Samples MW-5A (480-163557-1)[5X], MW-5B (480-163557-2)[5X], MW-7B (480-163557-3)[5X], MW-16A (480-163557-5)[10X], MW-16B (480-163557-6)[5X] and FD-120319 (480-163557-7)[5X] required dilution prior to analysis due to the abundance of non-target analytes. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHEMICAL OXYGEN DEMAND
Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for chemical oxygen demand in accordance with EPA Method 410.4. The samples were analyzed on 12/10/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

BIOCHEMICAL OXYGEN DEMAND
Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for Biochemical oxygen demand in accordance with SM 5210B. The samples were analyzed on 12/04/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON
Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for total organic carbon in accordance with SM 5310. The samples were analyzed on 12/09/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFIDE
Samples MW-5A (480-163557-1), MW-5B (480-163557-2), MW-7B (480-163557-3), MW-16A (480-163557-5), MW-16B (480-163557-6) and FD-120319 (480-163557-7) were analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 12/06/2019.

Sulfide was detected in method blank MB 240-414250/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 240-414250.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: Eurofins TestAmerica, Canton Job No.: 480-163557-1

SDG No.:

Concentration Units: ug/L

Analyte	RL	ICB 240-414467/5 12/09/2019 09:00		CCB 240-414467/60 12/09/2019 13:16		CCB 240-414467/72 12/09/2019 14:12		CCB 240-414467/79 12/09/2019 14:44	
		Found	C	Found	C	Found	C	Found	C
Iron	200	ND		ND		ND		27.4	J

Italicized analytes were not requested for this sequence.

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: Eurofins TestAmerica, Canton Job No.: 480-163557-1

SDG No.:

Instrument ID: I12 Analysis Method: 6010C

Start Date: 12/09/2019 08:42 End Date: 12/09/2019 14:58

Lab Sample Id	D/F	Type	Time	Analytes
				Fe
ZZZZZZ			11:57	
ZZZZZZ			12:01	
ZZZZZZ			12:06	
ZZZZZZ			12:11	
CCV 240-414467/47			12:15	
CCB 240-414467/48			12:20	
ZZZZZZ			12:24	
ZZZZZZ			12:29	
ZZZZZZ			12:34	
ZZZZZZ			12:38	
ZZZZZZ			12:43	
ZZZZZZ			12:48	
ZZZZZZ			12:52	
ZZZZZZ			12:57	
ZZZZZZ			13:02	
ZZZZZZ			13:07	
CCV 240-414467/59	1		13:11	X
CCB 240-414467/60	1		13:16	X
ZZZZZZ			13:22	
ZZZZZZ			13:27	
ZZZZZZ			13:32	
MB 240-414267/1-A	1	R	13:37	X
LCS 240-414267/2-A	1	R	13:42	X
480-163557-1	1	D	13:46	X
480-163557-1 SD	5	D	13:51	X
ZZZZZZ			13:55	
480-163557-1 MS	1	D	13:59	X
480-163557-1 MSD	1	D	14:04	X
CCV 240-414467/71	1		14:08	X
CCB 240-414467/72	1		14:12	X
480-163557-2	1	D	14:17	X
480-163557-3	1	D	14:22	X
480-163557-5	1	D	14:26	X
480-163557-6	1	D	14:31	X
480-163557-7	1	D	14:36	X
CCV 240-414467/78	1		14:40	X
CCB 240-414467/79	1		14:44	X
CCVL 240-414467/80	1		14:49	X
ICSA 240-414467/81	1		14:54	X
ICSAB 240-414467/82	1		14:58	X

FORM XIII-IN

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: BP IPO
BP/ARC Facility No: BP Hyde Park
Req Due Date (mm/dd/yy):
Lab Work Order Number:
Rush TAT: Yes ___ No X

Lab Name	Test America (Canton, OH)	BP/ARC Facility Address	3425 Hyde Park Blvd	Consultant/Contractor	AECOM
Lab Address	4101 Shuffel Street NW, North Canton, OH 44720	City, State, ZIP Code	Niagara, NY 14305	Consultant/Contractor Project No	60481767.17.14
Lab PM	Lab Contact: Amy McCormick	Lead Regulatory Agency	NYSDEC	Address	257 West Genesee St., Suite 400 Buffalo, NY 14202
Lab Phone	330-497-9396 / 330-497-0772	California Global ID No		Consultant/Contractor PM	James Kaczor
Lab Shipping Accnt		Enfos Proposal No		Phone	716-923-1300
Lab Bottle Order No		Accounting Mode	Provision ___ OOC BU ___ OOC RM ___	Email EDD To	James.Kaczor@aecom.com
Other Info		Stage	Activity	Invoice To	BP/ARC ___ Contractor X
BP/ARC EBM					
EBM Phone					
EBM Email					

Report Type & QC Level: Standard ___ Full Data Package ___

Lab No.	Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor		Total Number of Containers	Unpreserved	HNO3	HCl	NaoH/Zn-acetate	~~H3PO4~~ H2SO4		8260C -VOCs	SM-4500_S2_F -Sulfide	410.4 - COD	RSK 175 - Dissolved Gases	5310 C - TOC	5210-BOD (TA-Buffalo)	300, 300.0_28D (TA - Buffalo)	6010C - Dissolved Iron (field filtered)		Comments
	MW-10A	12-4-19	1107		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X		
	MW-10B	12-4-19	0958		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X		
	MW-19A	12-4-19	0950		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X		
	MW-18B	12-4-19	1145		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X		
	MW-7A	12-4-19	1235		X			39	6	3	18	3	9		X	X	X	X	X	X	X	X		+ MS/MSD
	MW-6	12-4-19	1355		X			3			3				X									
	TRIP BLANK - 120419	12-4-19	—		X			3			3				X									
	MW-19B	12-4-19	1537		X			3			3				X									

Comments Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

480-163616 Chain of Custody

Sampler's Name: [illegible signature names]
Sampler's Company: AECOM
Shipment Method: Dropoff at TA Buffalo, NY   Ship Date
Shipment Tracking No:

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
[signature]	12-4-19	1635	C Wallace	12/4/19	1635

Special Instructions: PO #93607 Line 2: TA Buffalo to ship to TA Canton except short hold bottles 5210-BOD, 300,300.0_28D :

THIS LINE - LAB USE ONLY. Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt ___ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

2.0 #1

BP/ARC LaMP COC Rev. 6 01/01/2009

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

2.6/3.3

2.9/3.6

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler	Lab PM: Johnson, Opal	Carrier Tracking No(s)	COC No: 480-53903.1
Client Contact: Shipping/Receiving	Phone	E-Mail: opal.johnson@testamericainc.com	State of Origin: New York	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - New York		Job #: 480-163616-1
Address: 4101 Shuffel Street NW	Due Date Requested: 12/17/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720	PO #			
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	WO #			
Email:	Project #: 24018856			
Project Name: BP Hyde Park	SSOW#:			
Site:				

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Oil, Tissue, Air, etc.)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C/5030C (MOD) TCL OLM03.1/4.2 Volatile Analyte L	6010C/FIELD_FLTRD (MOD) Custom Subset	410.4	5310C/ TOC	RSK_175 (MOD) MEE Only	SM4500_S2_F/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:											RSK MS W21
MW-10A (480-163616-1)	12/4/19	11:07 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-10B (480-163616-2)	12/4/19	09:56 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-18A (480-163616-3)	12/4/19	09:50 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-18B (480-163616-4)	12/4/19	11:45 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-7A (480-163616-5)	12/4/19	12:35 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-7A (480-163616-5MS)	12/4/19	12:35 Eastern	MS	Water			X	X	X	X	X	X	11	BP LaMP
MW-7A (480-163616-5MSD)	12/4/19	12:35 Eastern	MSD	Water			X	X	X	X	X	X	11	BP LaMP

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain of custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	Return To Client / Disposal By Lab / Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 2	Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Matthew LaRoth	12/5/19 17[illegible]	TA	ACarvett	12-6-19 0930	EHS
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks

Ver: 01/16/2019

CASE NARRATIVE

Client: AECOM

Project: BP Hyde Park

Report Number: 480-163616-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 12/4/2019 4:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4), MW-7A (480-163616-5), MW-6 (480-163616-6), TRIP BLANK-120418 (480-163616-7) and MW-19B (480-163616-8) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 12/10/2019 and 12/11/2019.

cis-1,2-Dichloroethene and Vinyl chloride failed the recovery criteria high for the MS of sample MW-7AMS (480-163616-5) in batch 240-414757.

cis-1,2-Dichloroethene failed the recovery criteria high for the MSD of sample MW-7AMSD (480-163616-5) in batch 240-414757.

Samples MW-10A (480-163616-1)[25X], MW-10B (480-163616-2)[20X], MW-18A (480-163616-3)[2X], MW-18B (480-163616-4)[2X] and MW-7A (480-163616-5)[2.5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for dissolved gases in accordance with RSK_175. The samples were analyzed on 12/13/2019 and 12/17/2019.

Ethane was detected in method blank MB 240-415751/3 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Samples MW-18B (480-163616-4)[10X] and MW-7A (480-163616-5)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED METALS (ICP)

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/10/2019 and analyzed on 12/12/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 12/05/2019.

Samples MW-10A (480-163616-1)[5X], MW-10B (480-163616-2)[5X], MW-18A (480-163616-3)[5X], MW-18B (480-163616-4)[5X] and MW-7A (480-163616-5)[5X] required dilution prior to analysis to bring the concentration of target analytes within the calibration range. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 12/05/2019.

Samples MW-10A (480-163616-1)[5X], MW-10B (480-163616-2)[5X], MW-18A (480-163616-3)[5X], MW-18B (480-163616-4)[5X] and MW-7A (480-163616-5)[5X] required dilution prior to analysis due to the abundance of non-target analytes. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHEMICAL OXYGEN DEMAND

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for chemical oxygen demand in accordance with EPA Method 410.4. The samples were analyzed on 12/12/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

BIOCHEMICAL OXYGEN DEMAND

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for Biochemical oxygen demand in accordance with SM 5210B. The samples were analyzed on 12/06/2019.

The glucose-glutamic acid standard recovered outside the recovery limits specified in the method in batch 480-508619 . Two out of the three volumes passed at 171.47 and 175.47. The other volume failed at 118.47.

Biochemical Oxygen Demand failed the recovery criteria low for LCS 480-508619/2.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for total organic carbon in accordance with SM 5310. The samples were analyzed on 12/09/2019.

Sample MW-18B (480-163616-4)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFIDE

Samples MW-10A (480-163616-1), MW-10B (480-163616-2), MW-18A (480-163616-3), MW-18B (480-163616-4) and MW-7A (480-163616-5) were analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 12/09/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: Eurofins TestAmerica, Canton Job No.: 480-163616-1

SDG No.:

Matrix: Water Level: Low Lab File ID: U1275088.D

Lab ID: 480-163616-5 MS Client ID: MW-7A MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Chloroethane	50.0	44	93.8	99	37-142	
cis-1,2-Dichloroethene	50.0	21	84.5	127	68-121	F1
1,1-Dichloroethane	50.0	69	123	108	71-121	
1,1-Dichloroethene	50.0	ND	54.3	109	64-132	
Tetrachloroethene	50.0	ND	48.7	97	52-129	
trans-1,2-Dichloroethene	50.0	ND	49.5	99	69-126	
1,1,1-Trichloroethane	50.0	ND	45.5	91	62-135	
Trichloroethene	50.0	ND	47.4	95	56-124	
Vinyl chloride	50.0	35	103	137	49-136	F1

Column to be used to flag recovery and RPD values

FORM III 8260C

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Canton Job No.: 480-163616-1

SDG No.:

Matrix: Water Level: Low Lab File ID: U1275089.D

Lab ID: 480-163616-5 MSD Client ID: MW-7A MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Chloroethane	50.0	90.1	91	4	35	37-142	
cis-1,2-Dichloroethene	50.0	83.1	124	2	35	68-121	F1
1,1-Dichloroethane	50.0	122	105	1	35	71-121	
1,1-Dichloroethene	50.0	40.4	81	29	35	64-132	
Tetrachloroethene	50.0	48.8	98	0	35	52-129	
trans-1,2-Dichloroethene	50.0	50.3	101	2	35	69-126	
1,1,1-Trichloroethane	50.0	45.5	91	0	35	62-135	
Trichloroethene	50.0	47.2	94	0	35	56-124	
Vinyl chloride	50.0	97.6	125	6	35	49-136	

Column to be used to flag recovery and RPD values

FORM III 8260C

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-163616-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 508263	Date: 12/05/2019 10:16										
						LCS Source: IC_ANION_LCS__00288					
300.0	LCS 480-508263/3	Chloride	48.6		mg/L	50.0	97	90-110			
300.0	LCS 480-508263/3	Sulfate	54.0		mg/L	50.0	108	90-110			
Batch ID: 508266	Date: 12/05/2019 10:16										
						LCS Source: IC_ANION_LCS__00288					
300.0	LCS 480-508266/3	Nitrate as N	4.91		mg/L	5.00	98	90-110			
Batch ID: 508618	Date: 12/06/2019 08:47										
						LCS Source: GGA_00011					
SM 5210B	LCS 480-508618/2	Biochemical Oxygen Demand	185		mg/L	198	94	85-115			
Batch ID: 508619	Date: 12/06/2019 08:53										
						LCS Source: GGA_00011					
SM 5210B	LCS 480-508619/2	Biochemical Oxygen Demand	155		mg/L	198	78	85-115			*

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

10
8856

Laboratory Management Program LaMP Chain of Custody Record

Page 1 of 1

BP/ARC Project Name: BP IPO
BP/ARC Facility No: BP Hyde Park
Req Due Date (mm/dd/yy):
Rush TAT: Yes ___ No X
Lab Work Order Number:

me	Test America (Canton, OH)
dress	4101 Shuffel Street NW, North Canton, OH 44720
l	Lab Contact: Amy McCormick
ione	330-497-9396 / 330-497-0772
ipping Accnt	
ttle Order No	
nfo	
C EBM	
hone	
mail	

BP/ARC Facility Address:	3425 Hyde Park Blvd
City, State, ZIP Code:	Niagara, NY 14305
Lead Regulatory Agency:	NYSDEC
California Global ID No.:	
Enfos Proposal No:	
Accounting Mode:	Provision ___ OOC-BU ___ OOC-RM ___
Stage:	Activity:

Consultant/Contractor:	AECOM
Consultant/Contractor Project No:	60481767.17.14
Address:	257 West Genesee St., Suite 400 Buffalo, NY 14202
Consultant/Contractor PM:	James Kaczor
Phone:	716-923-1300
Email EDD To:	James.Kaczor@aecom.com
Invoice To:	BP/ARC ___ Contractor X

Page 1215 of 1218			Matrix				No. Containers / Preservative							Requested Analyses								Report Type & QC Level
Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor		Total Number of Containers	Unpreserved	HNO3	HCl	NaoH/Zn-acetate	H3PO4, H2SO4		8260C -VOCs	SM-4500_S2_F -Sulfide	410.4 - COD	RSK 175 - Dissolved Gases	5310 C - TOC	5210-BOD (TA Buffalo)	300, 300.0_28D (TA - Buffalo)	6010C - Dissolved Iron (field filtered)		Standard ___ Full Data Package ___
MW-12B	12-5-19	1015		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X	
MW-14B	12-5-19	1010		X			3			3				X								Jcs only
MW-17A	12-5-19	1205		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X	
MW-17B	12-5-19	1350		X			13	2	1	6	1	3		X	X	X	X	X	X	X	X	
TRIP BLANK-124519	12-5-19	-		X			3			3				X								

480-163684 Chain of Custody

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
's Name	C.Av, T. Vibar						
's Company	AECOM		12-5-19	1545		12.5.19	1545
t Method	Dropoff at TA Buffalo, NY Ship Date						
t Tracking No							

l Instructions: PO #93607 Line 2: TA Buffalo to ship to TA Canton except short hold bottles 5210-BOD, 300,300.0_28D :

THIS LINE - LAB USE ONLY Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 3.0 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

47/54

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler	Lab PM: Johnson, Opal	Carrier Tracking No(s)	COC No: 480-93534-1
Client Contact: Shipping Receiving	Phone	E-Mail: opal.johnson@testamericainc.com	State of Origin: New York	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DEC AP - New York		Job #: 480-163684-1
Address: 4101 Shuffel Street NW	Due Date Requested: 12/16/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: BP Hyde Park	Project #: 24018856			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCl; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Oil, Tissue, Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C/5030C (MOD); TCL CLM03.1 + 2 Volatile Analyte L	6010C/FIELD_FLTRD (MOD) Custom Sublist	410.4	5310C/ TOC	RSK_175/ (MOD) MEE Only	SM4500_S2_F/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code											
MW-12B (480-163684-1)	12/5/19	10:15 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-14B (480-163684-2)	12/5/19	10:10 Eastern		Water			X						3	BP LaMP
MW-17A (480-163684-3)	12/5/19	12:05 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
MW-17B (480-163684-4)	12/5/19	13:50 Eastern		Water			X	X	X	X	X	X	11	BP LaMP
TRIP BLANK-120519 (480-163684-5)	12/5/19	Eastern		Water			X						3	BP LaMP

5 w RSK
88 26 MS

Special Instructions/Note:

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. makes the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return To Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment			
Relinquished by: [illegible]	Date/Time: 12/9/19 1760	Company: TA	Received by: [illegible]	Date/Time: 12-10-19 940	Company: ETTC	
Relinquished by	Date/Time	Company	Received by	Date/Time	Company	
Relinquished by	Date/Time	Company	Received by	Date/Time	Company	
Custody Seals Intact: Yes No	Custody Seal No.		Cooler Temperature(s) °C and Other Remarks			

CASE NARRATIVE

Client: AECOM

Project: BP Hyde Park

Report Number: 480-163684-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT
The samples were received on 12/5/2019 3:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)
Samples MW-12B (480-163684-1), MW-14B (480-163684-2), MW-17A (480-163684-3), MW-17B (480-163684-4) and TRIP BLANK-120519 (480-163684-5) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 12/14/2019 and 12/16/2019.

Samples MW-12B (480-163684-1)[2.5X] and MW-17A (480-163684-3)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Batch 240-415463 is reported without a matrix spike/matrix spike duplicate (MS/MSD), because the MS/MSD parent sample was reported in another batch. The MS/MSD result does not have immediate bearing on any samples except for the actual sample spiked. The associated laboratory control sample (LCS) met acceptance criteria and provides long-term precision and accuracy for this batch.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES
Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for dissolved gases in accordance with RSK_175. The samples were analyzed on 12/13/2019 and 12/16/2019.

Ethane was detected in method blank MB 240-415751/3 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Samples MW-17A (480-163684-3)[10X] and MW-17B (480-163684-4)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED METALS (ICP)
Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/12/2019 and analyzed on 12/13/2019.

Iron was detected in method blank MB 240-415145/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 12/07/2019 and 12/10/2019.

Samples MW-12B (480-163684-1)[5X], MW-17A (480-163684-3)[5X] and MW-17B (480-163684-4)[5X] required dilution prior to analysis to bring the concentration of target analytes within the calibration range. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 12/07/2019.

Samples MW-12B (480-163684-1)[5X], MW-17A (480-163684-3)[5X] and MW-17B (480-163684-4)[5X] required dilution prior to analysis due to the abundance of non-target analytes. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHEMICAL OXYGEN DEMAND

Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for chemical oxygen demand in accordance with EPA Method 410.4. The samples were analyzed on 12/13/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

BIOCHEMICAL OXYGEN DEMAND

Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for Biochemical oxygen demand in accordance with SM 5210B. The samples were analyzed on 12/07/2019.

Biochemical Oxygen Demand failed the recovery criteria low for LCS 480-508665/2.

The glucose-glutamic acid standard recovered low outside the recovery limits specified in the method in batch 480-508665.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for total organic carbon in accordance with SM 5310. The samples were analyzed on 12/13/2019 and 12/14/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFIDE

Samples MW-12B (480-163684-1), MW-17A (480-163684-3) and MW-17B (480-163684-4) were analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 12/12/2019.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 240-415136.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

3-IN
METHOD BLANK
METALS - TOTAL RECOVERABLE

Lab Name: Eurofins TestAmerica, Canton Job No.: 480-163684-1

SDG No.:

Concentration Units: ug/L Lab Sample ID: MB 240-415145/1-A

Instrument Code: I9 Batch No.: 415687

CAS No.	Analyte	Concentration	C	Q	Method
7439-89-6	Iron	39.9	J		6010C

FORM III-IN

METALS BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, Canton Job No.: 480-163684-1

SDG No.:

Batch Number: 415145 Batch Start Date: 12/12/19 14:00 Batch Analyst: Loeb, Matthew R

Batch Method: 3005A Batch End Date: 12/12/19 22:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ICPspike3 00008	MTTMHCL 00278	MTTMHNO3 00214	SPIKE1 00006
MB 240-415145/1		3005A, 6010C		50 mL	50 mL		2.5 mL	1 mL	
LCS 240-415145/2		3005A, 6010C		50 mL	50 mL	0.5 mL	2.5 mL	1 mL	0.5 mL
480-163684-D-1	MW-12B	3005A, 6010C	D	50 mL	50 mL		2.5 mL	1 mL	
480-163684-D-3	MW-17A	3005A, 6010C	D	50 mL	50 mL		2.5 mL	1 mL	
480-163684-D-4	MW-17B	3005A, 6010C	D	50 mL	50 mL		2.5 mL	1 mL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	SPIKE2 00004
MB 240-415145/1		3005A, 6010C		
LCS 240-415145/2		3005A, 6010C		0.5 mL
480-163684-D-1	MW-12B	3005A, 6010C	D	
480-163684-D-3	MW-17A	3005A, 6010C	D	
480-163684-D-4	MW-17B	3005A, 6010C	D	

Batch Notes	
Batch Comment	filter paper 81206102
Temperature - Corrected - End	Timer Degrees C
Temperature - Corrected - Start	92 Degrees C
Digestion Unit ID	C4
Pipette/Syringe/Dispenser ID	mp3
Thermometer ID	Temp Log
Digestion Tube/Cup ID	1906257
Temperature - Uncorrected - End	Timer Degrees C
Temperature - Uncorrected - Start	92 Degrees C

Basis	Basis Description
D	Dissolved

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

6010C

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-163684-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 508525	Date: 12/06/2019 23:33										
						LCS Source: IC_ANION_LCS__00288					
300.0	LCS 480-508525/3	Chloride	51.4		mg/L	50.0	103	90-110			
Batch ID: 508528	Date: 12/06/2019 23:33										
						LCS Source: IC_ANION_LCS__00288					
300.0	LCS 480-508528/3	Nitrate as N	5.31		mg/L	5.00	106	90-110			
Batch ID: 509065	Date: 12/10/2019 14:29										
						LCS Source: IC_ANION_LCS__00289					
300.0	LCS 480-509065/3	Chloride	48.5		mg/L	50.0	97	90-110			
300.0	LCS 480-509065/3	Sulfate	52.9		mg/L	50.0	106	90-110			
Batch ID: 508644	Date: 12/07/2019 06:20										
						LCS Source: GGA_00011					
SM 5210B	LCS 480-508644/2	Biochemical Oxygen Demand	178		mg/L	198	90	85-115			
Batch ID: 508665	Date: 12/07/2019 11:31										
						LCS Source: GGA_00011					
SM 5210B	LCS 480-508665/2	Biochemical Oxygen Demand	162		mg/L	198	82	85-115			*

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-163684-1

SDG No.:

Batch Number: 508665 Batch Start Date: 12/07/19 11:31 Batch Analyst: Amderson, Steven R

Batch Method: SM 5210B Batch End Date: 12/12/19 14:09

Lab Sample ID	Client Sample ID	Method Chain	Basis	Initial pH	ResidualChloCheck	InitialTemp	Final pH	InitialAmount	FinalAmount
USB 480-508665/1		SM 5210B		n/a SU	0	n/a Celsius	n/a SU	300 mL	300 mL
LCS 480-508665/2		SM 5210B		n/a SU	0	n/a Celsius	n/a SU	300 mL	300 mL
480-163684-A-4	MW-17B	SM 5210B	T	6.34 SU	0	20.3 Celsius	6.34 SU	300 mL	300 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	GGA 00011					
USB 480-508665/1		SM 5210B							
LCS 480-508665/2		SM 5210B		6 mL					
480-163684-A-4	MW-17B	SM 5210B	T						

Batch Notes	
Corrected Incubator Temp - Initial	19.4 Celsius
Incubator ID	2
Nutrient Buffer Pillow ID	5608628
Seed ID	5643805
Thermometer ID	2
Uncorrected Incubator Temp - Initial	193 Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

SM 5210B

mi microbialinsights

10515 Research Dr
Knoxville, TN 37932
865-573-8188

www.microbe.com

REPORT TO:

Name: James Kaczor
Company: AECOM
Address: 257 W. Genesee St. Suite 400
Buffalo, NY 14202

email: James.Kaczor@aecom.com
Phone: 716-923-1360
Fax:

Project Manager: James Kaczor
Project Name: BR-190 Hyde Park Blvd
Project No.: 60481767.4.19

INVOICE TO: (For invoices paid by a third party it is imperative that all information be provided)

Name:
Company: AECOM
Address:

email: James.Kaczor@aecom.com
Phone:
Fax:

Purchase Order No. #75765
Subcontract No.
MI Quote No.

Please Check One:
☐ More samples to follow
☒ No Additional Samples

Report Type: ☒ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (35%)

EDD type: ☒ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type: ______

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes	DHBt (Dehalobacter)	Other	Other	Other
012QL 1	MW-10A	12-4-19	1107	H2O	1					X	X	X			
2	MW-10B	12-4-19	0958	H2O	1					X	X	X			
3	MW-18A	12-4-19	0950	H2O	1					X	X	X			
4	MW-18B	12-4-19	1145	H2O	1					X	X	X			
5	MW-7A	12-4-19	1235	H2O	1					X	X	X			
6	MW-6	12-4-19	1355	H2O	1					X	X	X			
7	FD-120419	12-4-19	—	H2O	1					X	X	X			
7															

(MW-18B)

Relinquished by: [signature] Date 12/4/19 141

Received by: AJ Hessler Date 12/5/19

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

Appendix C

Monitoring Well Analytical Data Summary, 2007 to 2019

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 1A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
4/23/2008	5 U	5 U	5 U	5 U	5 U	2 U	1 U	1 U	2.6	5 U	5 U	5 U		2 U	6.02	1.53	112	109	1 U	0.05 U	0.05 U
10/27/2009	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	30	5 U	5 U	5 U		1.7 U	16.5 J	2	140 J	141	0.16 U	0 R	0.05 U

J Indicates an estimated value.
U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 1B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/30/2007	5 U	5 U	11	5 U	5 U	16	0.36 J	0.97 J	160	5 U	5 U	5 U		2 U	5 UJ	4.23	97.6	301	1 U		
4/23/2008	5 U	5 U	1.2 J	5 U	5 U	1.9 J	1 U	1 U	64	5 U	0.71 J	5 U		2 U	13	4.06	70	181	1 U	0.05 U	0.05 U
10/27/2009	5 U	5 U	1.3 J	5 U	5 U	1.7 J	5 U	5 U	59	5 U	5 U	5 U		1.6 U	32.5 J	4.5	71.8 J	218	0.16 U	0 R	0.05 U

J Indicates an estimated value.
U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 2A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	0.91 J	9.8	5 U	5 U	1.9 J				5 U	7.1	4.9 J									
4/28/2008	5 U	5 U	0.38 J	5 U	2.4 J	2 U				2 J	14	1.2 J									
10/28/2009	5 U	5 U	5 U	5 U	6	1.3 J				7.6	26	1.2 J									
5/11/2010	5 U	5 U	5 U	5 U	4.3 J	1.2 J	5 U	5 U	30	4.9 J	18	1.7 J									

J Indicates an estimated value.
U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 2B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	5 U	48	5 U	5 U	59				5 U	5 U	5 U									
4/28/2008	5 U	5 U	41	5 U	5 U	62				5 U	5 U	5 U									
10/28/2009	5 U	5 U	9.1	5 U	5 U	16				5 U	5 U	5 U									
5/11/2010	5 U	5 U	3.7 J	5 U	5 U	7.6	1.9 J	55	2300	5 U	5 U	5 U									
10/20/2011	5 U	5 U	1.8 J	5 U	5 U	2.6 J				5 U	5 U	5 U									
6/13/2012	5 U	5 U	2.7 J	5 U	5 U	8.6				5 U	5 U	5 U									
8/30/2013	5 U	5 U	2.3 J	5 U	5 U	4 J				5 U	5 U	5 U									
4/3/2014	1 U	1 U	1	0.72 J	1 U	2.2				1 UJ	0.92 J	1 U									
11/20/2015	1 U	1 U	0.87 J	0.56 J	1 U	3.4				1 U	0.65 J	1 U									
4/19/2016	1.0 U	1.0 U	0.95 J	1.0 U	1.0 U	2.2				1.0 U	0.96 J	1.0 U									
9/12/2017	1.0 U	1.0 U	0.77 J	1.0 U	1.0 U	1.8				1.0 U	0.5 J	1.0 U									
4/25/2018	1.0 U	1.0 U	1.3	1.0 U	1.0 U	2.6				1.0 U	1.0 U	1.0 U									

J Indicates an estimated value.
U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 3A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	0.9 J	5 U	5 U	2 U	0.54 J	1 U	6	5 U	5 U	5 U		2 U	19 J	3.21	16.4	319	3.64		
4/24/2008	5 U	0.21 J	0.71 J	5 U	5 U	2 U	1 U	1 U	12	5 U	5 U	5 U		2 U	6.92	2.89	0.2 U	292	1 U	0.05 U	0.05 U
8/12/2008	5 U	5 U	0.89 J	5 U	5 U	5 U	5 U	5 U	25	5 U	5 U					2.6	17.6	318			
10/6/2008	5 U	1.9 J	11	5 U	5 U	5 U	5 U	5 U	19 J	5 U	5 U	5 U				2.3	19.4 J	347			
12/8/2008	5 U	1.4 J	5 U	5 U	5 U	5 U	5 U	5 U	7.7 J	5 U	5 U	5 U				4.9	23.3	444			
1/26/2009	5 U	5 U	1 J	5 U	5 U	5 U	5 U	5 U	7.3 J	5 U	5 U	5 U									
3/16/2009	5 U	5 U	0.99 J	5 U	5 U	5 U	5 U	5 U	5 J	5 U	5 U	5 U				3.7	27.3	334			
10/27/2009	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	14 J	5 U	5 U	5 U		1.9 U	25.6 J	2.2	15.9 J	250	0.16 U	0 R	0.05 U

J Indicates an estimated value.
U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
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R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 3B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	1.9 J	5 U	5 U	2.2	1 U	1 U	220	5 U	5 U	5 U		2 U	5 UJ	3.19	134	395	1 U		
4/25/2008	5 U	5 U	2.1 J	5 U	5 U	2.2	0.6 J	1 U	180	5 U	5 U	5 U		4.17	14.1	3.64	132	333	1 U	0.05 U	0.05 U
10/27/2009	5 U	5 U	1.5 J	5 U	5 U	2.9 J	5 U	5 U	170	5 U	5 U	5 U		2.2 U	16.5 J	3.8	121 J	254	0.9	0 R	0.05 U

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MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 4A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	34	200	3.2 J	1.8 J	56	0.55 J	5.6	130	5 U	12	5 U		2 U	5 UJ	1.87	106	242	1 U		
4/29/2008	5 U	34	200	3.1 J	1.6 J	53	0.55 J	5.6	130	5 U	15	5 U		2 U	6.62	1.52	117	231	1 U	0.05 U	0.05 U
11/3/2009	5 U	130	110	5.7	2.5 J	41	5 U	4.6 J	83	5 U	17	5 U		2.6 U	50 U	1.7 J	97.1	244	0.16 U	0.1 U	0.05 U
5/14/2010	5 U	94	250	4.9 J	2.6 J	45	5 U	5.7	110	5 U	21	5 U		2.1 U	50 U	1.8	109	249	0.16 U	0.1 U	0.05 U
10/25/2011	5 U	160	150	8.1	3.8 J	73	5 U	12	170	5 U	18	5 U	0.0146 J	3.1 U	50 U	2.1	95.9 J	263 J	0.16 U	0.1 U	0.05 U
3/14/2012																					
3/15/2012	50 UJ	65 J	97 J	9.5 J	50 UJ	14 J	5.7	20	1200	50 UJ	18 J	50 UJ	0.0523 J			999	160	46.3			
6/12/2012	5 U	7.5	140	2.9 J	0.81 J	20	5 U	3.9 J	3700	5 U	5.4	7.8	3.22		1350	434	89.8	5 U		0.1 U	0.05 U
6/13/2012																			0.34		
6/25/2012														796							
11/29/2012	5 U	5.5	120	4.2 J	0.92 J	39	5 U	48	7900	5 U	3.6 J	21	4.85			397	37.8	5 U			
9/3/2013	5 U	4.2 J	31	3.5 J	5 U	11	1.4 J	60 J	11000	5 U	1.3 J	17		551 J	1040 J	251	82.9	1.6 J	0.074 J	0.1 UJ	0.05 U
1/22/2014	5 U	1.1 J	7.5	2.4 J	5 U	7.2	5 U	65	22000	5 U	5 U	12	39.4			362	87.3	5 U	0.16 U		
4/3/2014	1 U	1.2	3.7	2.1	1 U	4.1	4.2 J	47	25000	1 U	1 U	12	36.2	342	640	205	99	5 U	0.17	0.1 UJ	0.018 J
10/14/2014	1 U	0.57 J	5.3	2.2	1 U	5.8	3.5 J	56	19000 J	1 UJ	1.1	9.1	57.6			159	83.8	2.5 J	0.16 U		
11/18/2015	1 U	1.2	1.3	1 U	1 U	1.1	5.2	18	17000	1 U	1	3	14.5	70.6	443	36.6	123	5.6	0.085 J	0.1 U	0.05 U
4/21/2016	1.0 U	3.4	2.8	1.0 U	1.0 U	1.1	4.3 J	8.6	26000 D	1.0 U	1.4	3	9.67	34.3	181	20.4	179	7.6	0.069 J	0.10 U	0.050 U
9/11/2017	1.0 U	1.3	0.68 J	1.0 U	1.0 UJ	2.6	3.9	5.5	5400 D	1.0 U	1.4	2.7	11	27	48	17	26	2.1 J	1.0 U	0.25 U	0.050 UJ
4/23/2018	1.0 U	0.44 J	1.1	0.51 J	1.0 U	0.96 J	10 U	10 U	21000	1.0 U	1.8	2.5	14	7.6	23	7.2	110	3.7 J	1.0 U	0.25 U	0.050 UJ

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MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 4B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	23	5 U	5 U	11	0.39 J	0.39 J	200	5 U	1.4 J	5 U		2 U	5.52 J	3.15	152	316	2.59		
4/29/2008	5 U	5 U	12	5 U	5 U	13	0.43 J	0.66 J	260	5 U	5 U	5 U		2 U	8.98	3.29	152	247	1 U	0.05 U	0.05 U
11/3/2009	5 U	5 U	9.7	5 U	5 U	9.5	5 U	5 U	140	5 U	5 U	5 U		3 U	25.6 J	2.9 J	190	267	0.16 J	0.1 U	0.05 U
5/14/2010	5 U	5 U	2.8 J	5 U	5 U	12	5 U	5 U	160	5 U	5 U	5 U		2.7 U	13.3 J	3.4	165	305	0.16 U	0.1 U	0.05 U
1/16/2014	5 U	5 U	11	5 U	5 U	15	5 U	2.8 J	150	5 U	1.1 J	5 U	0.459			3.9	142	298 J+	0.16 U		

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MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 5A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007															5 UJ						
10/30/2007	5 U	0.59 J	2.6 J	5 U	5 U	2 U	1 U	1 U	0.74 J	5 U	5 U	5 U		2 U		1.14	569	172	1 U		
4/22/2008	5 U	0.47 J	37	0.35 J	5 U	16	2	4.7	22	5 U	5 U	5 U		2 U	12.2	1.44	542	164	1 U	0.613	0.05 U
10/29/2009	5 U	5 U	5.9	5 U	5 U	1.8 J	5 U	5 U	5.5 J	5 U	5 U	5 U		1.7 U	23.3 J	1.1	263	148 J	0.16 U	0.85	0.05 U
5/13/2010	5 U	5 U	110	0.97 J	5 U	84	1.8 J	45	100	5 U	5 U	5 U		1.6 U	15.6 J	1.3	188	126	0.16 U	0.7	0.05 U
10/21/2011	5 U	5 U	5.7	5 U	5 U	3.3 J	5 U	1.5 J	9.6 J	5 U	5 U	5 U	0.0265 J	3.1 U	50 U	1.5	204	164	0.16 U	0.75	0.05 U
6/12/2012	5 U	5 U	88	1 J	5 U	82	2.8 J	34	130	5 U	5 U	1 J	0.2 U	3.2 U	50 U	0.98 J	120	116	0.16 U	0.57	0.05 U
8/28/2013	5 U	5 U	110	1.4 J	5 U	190	9.5	100	460	5 U	1.3 J	5 U		4.3 U	50 U	1.2	106 J	91.7	0.16 U	0.35	0.05 U
4/2/2014	1 U	1 U	240	2.3	1 U	300	16	110	1100	1 UJ	3.3	2.1	0.4 U	4.1 U	50 U	2.3	128 J-	63.3 J+	0.16 U	0.13	0.05 U
11/17/2015	1 U	1 U	150	1.6	1 U	140	5.4	39	2000	1 U	1.4	1.5	0.4 U		50 U	1 U	102	102	0.16 U	0.61	0.05 U
11/20/2015														6 U							
4/19/2016	1.0 U	1.0 U	340 D	5.4	1.0 U	340 D	12	87	7500	1.0 U	4.2	1.0 U	0.400 U	7.3	24.4 J	1.2	151	70.2	0.10 U	0.56	0.050 U
9/13/2017	2.0 U	2.0 U	61	0.74 J	2.0 U	68	2.1	9.8	460	2.0 U	0.88 J	2.0 U	0.100 U	2.0 U	12	0.76 J	69	99	1.0 U	0.25 U	0.050 U
4/24/2018	13 U	13 U	250	13 U	13 U	310	18	69	4200	13 U	3.3 J	13 U	0.200 U	4	4.2 J	1.5	120	60	1.0 U	0.13 J	0.050 UJ
12/3/2019	1.0 U	0.47 J	9.5	1.0 U	1.0 U	11	2.1	3.7	140	1.0 U	1.0 U	1.0 U	0.20 U	2.0 U	4.1 J	0.68 J	89	97	1.0 U	0.59	

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MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 5B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	0.76 J	61	0.66 J	5 U	49	1 U	0.6 J	86	5 U	0.38 J	5 U		2 U	5 UJ	4.26	83.2	230	1 U		
4/22/2008	5 U	0.51 J	58	0.5 J	5 U	57	0.37 J	0.76 J	80	5 U	5 U	5 U		2 U	9.57	4.49	81	223	1.94	0.05 U	0.05 U
10/29/2009	5 U	5 U	39	5 U	5 U	37	5 U	5 U	50	5 U	5 U	5 U		1.7 U	14.2 J	4.9	112	229 J	0.16 U	0.1 U	0.05 U
5/13/2010	5 U	1.1 J	36	5 U	5 U	39	5 U	5 U	63	5 U	5 U	5 U		1.2 U	15.6 J	4.7	98.5	234	0.16 U	0.1 U	0.05 U
11/9/2010	5 U	5 U	43	5 U	5 U	45	5 U	1.1 J	81	5 U	5 U	5 U				4.1	111	254			
10/21/2011	5 U	5 U	48	5 U	5 U	63	5 U	5 U	72	5 U	5 U	5 U	0.0196 J	2.5 U	17.9 J	4.9	130	358	0.16 U	0.1 U	0.05 U
6/13/2012	5 U	5 U	33	5 U	5 U	34	5 U	5 U	50	5 U	5 U	5 U	0.2 U	3.7 U	33.3 J	3.4	187	255	0.16 U	0.1 U	0.05 U
11/30/2012	5 U	5 U	39	5 U	5 U	44	5 U	5 U	66	5 U	5 U	5 U				3	166	267			
8/28/2013	5 U	5 U	32	5 U	5 U	44	5 U	5 U	41	5 U	5 U	5 U		2.8 U	15.6 J	4.5	119 J	299	0.16 U	0.1 U	0.05 U
4/3/2014	1 U	1	16	1 U	1 U	29	5 U	5 U	63	1 UJ	1 U	1 U	0.379 J	4.4 U	50 U	5.3	100	240	0.16 U	0.1 UJ	0.05 U
11/17/2015	1 U	0.58 J	34	1 U	1 U	65	5 U	2.3 J	120	1 U	1 U	1 U	0.502	5.1 U	17.5 J	3.1	117	251	0.16 U	0.1 U	0.05 U
4/19/2016	1.0 U	1.0 U	32	1.0 U	1.0 U	71	5.0 U	1.6 J	86	1.0 U	1.0 U	1.0 U	0.332 J	3.3 U	24.4 J	3	166	259	0.10 U	0.10 U	0.050 U
9/13/2017	5.0 U	5.0 U	36	5.0 U	5.0 U	91	0.50 U	2.2	110	5.0 U	5.0 U	5.0 U	0.54	2.0 U	17	3.4	110	240	1.0 U	0.50 U	0.050 U
4/24/2018	1.0 U	1.0 U	32	1.0 U	1.0 U	78	1.0 U	3.3	160	1.0 U	0.3 J	1.0 U	0.4	2.0 U	8.3 J	3.6	110	240	1.0 U	0.25 UJ	0.050 UJ
12/3/2019	2.0 U	2.0 U	32	2.0 U	2.0 U	90	0.66 J	4.8	270	2.0 U	2.0 U	2.0 U	0.41	2.0 U	9.4 J	3.3	110	240	1.1	0.25 U	

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D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 6

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	5 U	130	0.52 J	5 U	82				5 U	5 U	5 U									
4/29/2008	5 U	5 U	150	0.39 J	5 U	100				5 U	5 U	5 U									
10/30/2009	5 U	5 U	85	5 U	5 U	69				5 U	5 U	5 U									
5/12/2010	5 U	5 U	39	5 U	5 U	48	5 U	23	310	5 U	5 U	5 U		3.6 U	22.4 J	3.9	140 J	217	3.4	0.1 U	0.05 U
10/20/2011	5 U	5 U	33	5 U	5 U	57				5 U	5 U	5 U									
6/13/2012	5 U	5 U	30	5 U	5 U	47				5 U	5 U	5 U									
8/30/2013	5 U	5 U	24	5 U	5 U	42				5 U	5 U	5 U									
4/3/2014	1 U	1 U	18	1 U	1 U	39				1 U	1 U	1 U									
11/20/2015	1 U	1 U	20	1 U	1 U	57				1 U	1 U	1 U									
4/21/2016	1.0 U	1.0 U	18	1.0 U	1.0 U	59				1.0 U	1.0 U	1.0 U									
9/12/2017	5.0 U	5.0 U	16	5.0 U	5.0 U	79				5.0 U	5.0 U	5.0 U									
4/26/2018	1.0 U	1.0 U	12	1.0 U	1.0 U	48				1.0 U	1.0 U	1.0 U									
12/4/2019	1.0 U	1.0 U	10	1.0 U	1.0 U	78				1.0 U	1.0 U	1.0 U									

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MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 7A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	25 U	36	580	25 U	9 J	60	0.95 J	8.5	10	25 U	80	25 U		2 U	7.97 J	2.74	21	250	1 U		
4/28/2008	5 U	210	1700	6.1 J	24	130	0.44 J	5.3	8.6	1.3 J	220	5 U		2 U	5.42	2.23	17.3	210	1 U	0.05 U	0.24
8/13/2008	13 U	270	1800	5.9 J	34	130	5 U	7.2	21	4.1 J	280					3.2	22.3	282			
10/8/2008	5 U	58	1800	3.5 J	25	210	5 U	12	21 J	5 U	250	5 U				143	21.3 J	60.4			
12/9/2008	10 U	4.3 J	1100	1.7 J	9.6 J	180	5 U	27	24	10 U	150	10 U				25.1	24.1	295			
1/27/2009	5 U	3.2 J	840	2.4 J	7.6	390	5 U	51	110	5 U	230	5 U									
3/17/2009	5 U	2.9 J	620	1.5 J	3.6 J	250	5 U	69	210	5 U	140	5 U				8.8	25	253			
10/15/2009	5 U	2.7 J	120	5 U	5 U	240	5 U	110	760	5 U	56	5 U				4.7	21.1	228			
10/30/2009	5 U	1.8 J	210	5 U	5 U	150	5 U	51	260	5 U	49	5 U		4.2 U	23.3 J	3.2	21.8	233 J	2.2	0.1 U	0.05 U
11/18/2009																1150					
12/14/2009	5 U	5 U	140	5 U	5 U	100	5.1	100	1900	5 U	47	5 U				207	23.3 J	56.2 J			
2/9/2010	5 U	5 U	77	5 U	5 U	84	1.1 J	92	1200	5 U	48	5 U				40.1 J	24.1	87.6			
4/1/2010	5 U	5 U	22	5 U	5 U	49				5 UJ	39	5 U									
5/6/2010	5 U	5 U	65	5 U	5 U	50	5 U	5 U	15 U	5 U	33	5 U				95.5	20.9 J	52.2 J			
11/10/2010	5 U	5 U	44	5 U	5 U	18	43 J	65 J	16000	5 U	15	23				261	26.7	31.8			
10/27/2011	5 U	5 U	20	5 U	5 U	19	57	25	20000	5 U	22	13	0.115 J			25.1	28.7	57.1			
3/14/2012	25 U	25 U	11 J	25 U	25 U	25 U	20	8	6700	25 U	18 J	15 J	4.09			1380	34.3	5			
6/14/2012	5 U	1.2 J	3.8 J	5 U	5 U	5 U	5.8	3.3 J	6300	5 U	9.1	22	3.6			573	24.3	5 U			
11/28/2012	5 U	5 U	2.7 J	5 U	5 U	1.3 J	10	1.1 J	16000	5 U	13	16	0.691			204	26.2	5.7			
8/30/2013	5 U	5 U	3.9 J	5 U	5 U	2.2 J	11	3.5 J	13000	5 U	15	7.8		277 J	576	151	26	8.7	0.16 J	0.1 U	0.05 U
1/15/2014	5 U	5 U	4 J	5 U	5 U	1.8 J	8.4	2.7 J	17000	5 U	16	13	39.4			1340	50.4 J+	5 U	0.34		
4/2/2014	1 U	1 U	3	1 U	1 U	1	6.3	1.2 J	20000	1 U	12	16	22.9	589	1250	453	25.5	2.3 J	0.067 J	0.1 U	0.05 U
10/9/2014	1 U	1 U	0.92 J	1 U	1 U	0.94 J	4.7 J	5 U	16000	1 U	8.1	11	14.1			132	27.9	4 J	0.11 J		
11/19/2015	1 U	1 U	1.5	1 U	1 U	3.1	2.8 J	1.1 J	5900	1 U	11	4.8	7.85	99.3	293 J-	84.3	24.6	20.2	0.22	0.1 U	0.05 U
4/20/2016	1.0 U	1.0 U	1.9	1.0 U	1.0 U	3.7	4 J	1.3 J	16000 D	1.0 U	12	4.2	2.18	62	217	50.1	27.4	5.1	0.5	0.10 U	0.050 U
9/12/2017	2.0 U	2.0 U	26	2.0 U	2.0 U	33	2.9	4.1	3400 D	2.0 U	61 J	19	1.7	61	170	52	25	93	1.0 U	0.25 U	0.050 UJ
4/25/2018	5.0 U	5.0 U	46	5.0 U	5.0 U	42	61	63	14000	5.0 U	140	23	0.55	9.2 J	97	32	25	56	1.1	0.25 U	0.027 J
12/4/2019	2.5 U	2.5 U	21 J	2.5 U	2.5 U	35 J	95	25	13000 D	2.5 U	69	44	1.5	14 J-	42	17	12	70	1.0 U	0.25 U	

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U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 7B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	5 U	11	5 U	5 U	31	0.31 J	1.9	220	5 U	5 U	5 U		2 U	6.58 J	3.41	157	298	1 U		
4/28/2008	5 U	5 U	10	5 U	5 U	45	0.44 J	2.8	230	5 U	5 U	5 U		2 U	11.6	3.45	130	278	1 U	0.05 U	0.05 U
10/7/2008	5 UJ	5 UJ	19 J	5 UJ	5 UJ	29 J	5 U	3.1 J	220 J	5 UJ	5 UJ	5 UJ				5	164 J	271			
12/9/2008	5 U	5 U	21	5 U	5 U	33	5 U	4.1 J	250	5 U	5 U	5 U				9	153	384			
1/27/2009	5 U	5 U	13	5 U	5 U	29	5 U	3.3 J	220	5 U	5 U	5 U									
3/17/2009	5 U	5 U	20	5 U	5 U	30	5 U	2.1 J	150	5 U	5 U	5 U				5.3	179	296			
10/15/2009	5 U	5 U	7.1	5 U	5 U	39	5 U	3.3 J	340	5 U	5 U	5 U				6.4	146	250			
10/30/2009	5 U	5 U	7.3	5 U	5 U	24				5 U	5 U	5 U									
12/14/2009	5 U	5 U	7.7	5 U	5 U	24	5 U	3.6 J	260	5 U	5 U	5 U				26.8	171 J	220 J			
2/9/2010	5 U	5 U	3.2 J	5 U	5 U	21	5 U	6.1	650	5 U	5 U	5 U				13.9 J	157	248			
3/31/2010	5 U	5 U	3.8 J	5 U	5 U	29				5 U	5 U	5 U									
5/6/2010	5 U	5 U	4.5 J	5 U	5 U	31	5 U	5 U	15 U	5 U	5 U	5 U				60.6	130 J	244 J			
11/11/2010	5 U	5 U	6.7	5 U	5 U	24	5 U	4.2 J	1200	5 U	5 U	5 U				17.5	168	239			
10/26/2011	5 U	5 U	6	5 U	5 U	25	5 U	3.6 J	3400	5 U	5 U	5 U	0.0747 J			8.4	168	218 J			
3/15/2012	50 U	50 U	50 U	50 U	50 U	11 J	5 U	9.3	4500	50 U	50 U	50 U	0.0443 J			68.1	153	122			
6/14/2012	5 U	5 U	1.6 J	5 U	5 U	9.2	5 U	7.9	2400	5 U	5 U	5 U	0.2 U			19.3	150	143			
11/27/2012	5 U	5 U	1.5 J	5 U	5 U	9.5	5 U	11	3300	5 U	5 U	5 U	0.2 U			8.7	173	178			
9/3/2013	5 U	5 U	1.2 J	5 U	5 U	7.5	5 U	11	6400	5 U	5 U	5 U		17.4	95 J	11.5	146 J	139	10.3	0.1 UJ	0.05 U
1/13/2014	5 U	5 U	5 U	5 U	5 U	2 J	5 U	9.4	18000	5 U	5 U	5 U	0.4 U			70.1	145	61.7	47.9		
4/2/2014	1 U	1 U	1 U	1 U	1 U	5.5	5 U	11	19000	1 U	1 U	1 U	0.4 U	366	772	132	136	117	33.3	1 U	0.026 J
10/10/2014	1 U	1 U	1.5	1 U	1 U	8	5 U	7	13000	1 U	1 U	1 U	0.4 U			22.2	164	129	22.6		
11/23/2015	1 U	1 U	1.2	1 U	1 U	6.1	5 U	4.3 J	11000	1 U	1 U	1 U	0.4 U	22.2	97.8	10.8	189	146	20.4	0.1 U	0.05 U
4/20/2016	1.0 U	1.0 U	0.82 J	1.0 U	1.0 U	10	5.0 U	5.6	5000 D	1.0 U	1.0 U	1.0 U	0.400 U	27.1	142	6.9	172	162	16.5	0.10 U	0.050 U
9/12/2017	1.0 U	1.0 U	2.2	1.0 U	1.0 U	18	0.50 U	1.9	370	1.0 U	1.0 U	1.0 U	0.100 U	9.6	41	4.8	170	180	1.1	0.25 U	0.050 UJ
4/25/2018	1.0 U	1.0 U	2.2	1.0 U	1.0 U	17	1.0 U	6.4	240	1.0 U	1.0 U	1.0 U	0.200 U	2	29	4.7	140	260	1.0 U	0.25 U	0.050 U
12/3/2019	1.0 U	1.0 U	1.3	1.0 U	1.0 U	10	0.58 J	3.3	290	1.0 U	1.0 U	1.0 U	0.20 U	2.0 U	12	3.3	180	190	7.1	0.25 U	

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW- 8

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	2.2 J	5 U	5 U	1.8 J				5 U	5 U	5 U									
4/25/2008	5 U	5 U	2.5 J	5 U	5 U	2.6				5 U	5 U	5 U									
11/2/2009	5 U	5 U	2.1 J	5 U	5 U	2.6 J				5 U	5 U	5 U									
5/12/2010	5 U	5 U	2.3 J	5 U	5 U	2.2 J	5 U	5 U	140	5 U	5 U	5 U									
10/24/2011	5 U	5 U	1.9 J	5 U	5 U	2.1 J				5 U	5 U	5 U									
6/12/2012	5 U	5 U	1.6 J	5 U	5 U	1.1 J				5 U	5 U	5 U									
8/30/2013	5 U	5 U	1.7 J	5 U	5 U	1.8 J				5 U	5 U	5 U									
4/3/2014	1 U	1 U	1.6	1 U	1 U	1.5				1 U	1 U	1 U									
11/23/2015	1 U	1 U	1.7	1 U	1 U	1.9				1 U	1 U	1 U									
4/22/2016	1.0 U	1.0 U	1.9	1.0 U	1.0 U	1.8				1.0 U	1.0 U	1.0 U									
9/13/2017	1.0 U	1.0 U	1.7	1.0 U	1.0 U	1.4				1.0 U	1.0 U	1.0 U									
4/23/2018	1.0 U	1.0 U	1.9	1.0 U	1.0 U	1.6				1.0 U	1.0 U	1.0 U									

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-10A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	5 U	300	12	0.68 J	67	0.52 J	4.6	19	5 U	4.5 J	5 U		2 U	8.32 J	1.93	815	332	1 U		
4/22/2008	5 U	5 U	390	10	1.6 J	97	4.4	11	60	5 U	5.8	5 U		2 U	10.1	2.99	884	294	1 U	0.05 U	0.05 U
10/29/2009	5 U	5 U	400	9.4	1.5 J	140	5 U	10	38	5 U	6.4	5 U		1.8 U	46.2 J	1.6	903	279 J	0.16 U	0.1 U	0.05 U
5/11/2010	5 U	5 U	390	7.6	1.3 J	140	5 U	17	71	5 U	5.7	5 U		1.7 U	38.4 J	1.5	784	250	0.16 U	0.1 U	0.05 U
10/25/2011	5 U	5 U	630	11	1.2 J	250	5 U	29	66	5 U	7.7	5 U	0.0808 J	2.8 U	27 J	1.9	770 J	254 J	0.16 U	0.1 U	0.05 U
6/13/2012	5 U	5 U	620	13	1 J	170	1.5 J	43	120	5 U	7	5 U	0.2 U	3.2 U	31 J	0.98 J	621	264	0.16 U	0.1 U	0.05 U
8/29/2013	5 U	5 U	570	9.9	5 U	130	5 U	28	130	5 U	5.6	5 U		2.9 UJ	27 J	1.8	481	193	0.16 U	0.1 U	0.05 U
4/2/2014	1 U	1 U	560	8	0.6 J	95	5 U	24	170	1 UJ	4.4	1 U	0.719	3.9 U	17.2 J	2	438 J-	228 J+	0.16 U	0.1 U	0.05 U
11/18/2015	1 U	1 U	710	9.1	0.52 J	130	5 U	17	220	1 U	5.3	1 U	1.81	2.9 U	22.1 J	0.87 J	434	170	0.16 U	0.1 U	0.05 U
4/19/2016	1.0 U	0.57 J	960 D	12	0.71 J	83	5.0 U	6.4	88	1.0 U	5.4	1.0 U	0.831	3.4 U	33.6 J	0.9 J	523	216	0.10 U	0.10 U	0.050 U
9/13/2017	20 U	20 U	590	6.8 J	20 U	130	0.38 J	11	400	20 U	20 UJ	20 U	1.4	2.0 U	13	1.1	310	170	1.0 U	0.50 U	0.050 U
4/25/2018	20 U	20 U	540	20 U	20 U	94	1.0 U	12	640	20 U	20 U	20 U	1.2	2.0 U	10	1.4	260	160	1.0 U	0.25 U	0.050 U
12/4/2019	25 U	5 J	500	25 U	25 U	130	2.4	36	2000	25 U	25 U	25 U	1.1	2.0 UJ	4.2 J	1.4	200	150	1.0 U	0.25 U	

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-10B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	0.7 J	220	1.9 J	0.38 J	130	0.43 J	1.5	100	5 U	0.69 J	5 U		2 U	5 UJ	3.81	226	236	1 U		
4/22/2008	5 U	0.46 J	180	1.3 J	5 U	76	0.48 J	1 J	96	5 U	0.54 J	5 U		2 U	12.7	4.22	87.4	198	1 U	0.05 U	0.05 U
4/23/2008																					
10/16/2009	5 U	5 U	420	3.1 J	5 U	120	5 U	2.7 J	110	5 U	5 U	5 U				3.8	121	239			
10/29/2009	5 U	5 U	370	3.8 J	5 U	150	5 U	2.2 J	94	5 U	5 U	5 U		2.1 U	16.5 J	4.6	107	245 J	0.16 U	0.1 U	0.05 U
12/16/2009	5 U	5 U	750	9	5 U	260	5 U	12	110	5 U	5 U	5 U				4.2	123 J	268 J			
2/10/2010	5 U	5 U	300	4 J	5 U	120	5 U	3.7 J	92	5 U	5 U	5 U				4.2 J	87.5	253			
3/30/2010	5 U	5 U	270	3.1 J	5 U	90				5 U	5 U	5 U									
5/6/2010	5 U	5 U	220	2 J	5 U	83	5 U	5 U	15 U	5 U	5 U	5 U		3.5 U	50 U	4.9	89.5 J	244 J	0.071 J	0.1 U	0.05 U
11/9/2010	5 U	5 U	1100	13	1.9 J	200	1.8 J	13	130	5 U	5 U	5 U				3.2	272	225			
10/26/2011	10 U	10 U	960	11	1.8 J	180	2.7 J	24	300	10 U	10 U	10 U	0.0459 J	3.5 U	13.4 J	3.4	189	259 J	0.16 U	0.1 U	0.05 U
3/12/2012	5 U	5 U	260	3 J	5 U	49	5 U	1.2 J	53	5 U	5 U	5 U	0.2 U			3.8	104	245			
6/14/2012	5 U	5 U	280	1.7 J	5 U	110	5 U	5.7	120	5 U	5 U	5 U	0.2 U	3.3 U	12.9 J	3.8	141	261	0.16 U	0.1 U	0.05 U
11/27/2012	5 U	5 U	630	5.8	5 U	130	5 U	11	160	5 U	5 U	5 U	0.2 U			3	194	265			
8/29/2013	5 U	5 U	230	1.5 J	5 U	120	5 U	9.2	220	5 U	5 U	5 U		3.1 UJ	24.7 J	2	156	246	0.16 U	0.1 U	0.05 U
1/17/2014	5 U	5 U	150	5 U	5 U	27	5 U	2 J	38	5 U	5 U	5 U	0.0884 J			7.9	128	250	0.16 U		
4/2/2014	1 U	1 U	190	0.7 J	1 U	22	5 U	2.3 J	38	1 U	1 U	1 U	0.076 J	3.2 U	50 U	4.8	133	256	0.16 U	0.1 U	0.05 U
10/14/2014	1 U	1 U	160	1 U	1 U	89	1.1 J	210	1100	1 UJ	1 U	1 U	0.05 J			5	137	215	1.3		
11/16/2015	1 U	1 U	190	0.68 J	1 U	190	2.1 J	190	2900	1 U	0.9 J	1 U	0.4 U	6 U	17.5 J	3	145	207	0.71	0.1 U	0.05 U
4/19/2016	1.0 U	1.0 U	220	1.1	1.0 U	6.1	5.0 U	5.0 U	9.1	1.0 U	1.0 U	1.0 U	0.400 U	3.6 U	26.7 J	2.9	160	272	0.10 U	0.087 J	0.050 U
9/13/2017	10 U	10 U	360	10 U	10 U	270	4.5	130	3900	10 U	10 UJ	10 U	0.24	2.0 U	17	3.2	150	230	1.0 U	0.50 U	0.050 U
4/25/2018	8.0 U	8.0 U	210	8.0 U	8.0 U	12	1.0 U	1.0 U	25	8.0 U	8.0 U	8.0 U	0.14 J	2.4 UJ	10 U	3.6	130	240	1.0 U	0.25 U	0.050 U
12/4/2019	20 U	20 U	420	4 J	20 U	180	1.8	27	1500	20 U	20 U	20 U	0.68	2.0 U	10 U	3	220	260	1.0 U	0.25 U	

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UJ The analyte was not detected. The reporting limit is an approximate value.
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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-11A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
4/22/2008	5 U	5 U	5 U	5 U	5 U	0.7 J				5 U	5 U	5 U									
10/30/2009	5 U	5 U	5 U	5 U	5 U	5 U				5 U	5 U	5 U									
5/11/2010	5 U	5 U	5 U	5 U	5 U	3.2 J	5 U	5 U	51	5 U	5 U	5 U									

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-11B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	5 U	140	1 J	5 U	80				5 U	0.39 J	5 U									
4/22/2008	5 U	5 U	100	0.77 J	5 U	64				5 U	5 U	5 U									
3/18/2009																3.8					
10/16/2009	5 U	5 U	64	5 U	5 U	73	5 U	14	170	5 U	5 U	5 U				3.4	172	221			
10/30/2009	5 U	5 U	56	5 U	5 U	48	5 U	15	150	5 U	5 U	5 U		1.8 U	21 J	3.4	165	207 J	0.3	0.1 U	0.05 U
12/16/2009	5 U	5 U	5.3	5 U	5 U	17	5 U	81	190	5 U	5 U	5 U				7.4	148 J	221 J			
2/10/2010	5 U	5 U	2.3 J	5 U	5 U	11	5 U	130	760	5 U	5 U	5 U				11.7 J	146	50.2			
3/30/2010	5 U	5 U	2.1 J	5 U	5 U	7.1				5 U	5 U	5 U									
5/6/2010	5 U	5 U	1.9 J	5 U	5 U	7.4	5 U	5 U	15 U	5 U	1.3 J	5 U		64.7 J	132	14.1	114 J	101 J	48.3	0.1 U	0.05 U
11/9/2010	5 U	5 U	1.4 J	5 U	5 U	4.3 J	5 U	57	1100	5 U	1.2 J	5 U				3.9	125	208			
10/26/2011	5 U	5 U	2.2 J	5 U	5 U	4.6 J	5 U	90	1500	5 U	1.8 J	5 U	0.0859 J	8.9	31.5 J	3.8	157	245 J	8.5	0.043 J	0.05 U
3/12/2012	5 U	5 U	1.4 J	5 U	5 U	6.7	1.3 J	72	5200	5 U	1.5 J	5 U	0.0711 J			9.5	117	118			
6/14/2012	5 U	5 U	1.8 J	5 U	5 U	6.1	2.6 J	110	7400	5 U	1.4 J	5 U	0.2 U	32	76.5	4.3	121	135	44.4	0.1 U	0.05 U
11/27/2012	5 U	5 U	0.83 J	5 U	5 U	2.5 J	3.9 J	130	6800	5 U	1.4 J	5 U	0.2 U			3.9	143	164			
8/29/2013	5 U	5 U	5 U	5 U	5 U	1.4 J				5 U	1.9 J	5 U									
1/14/2014	5 U	5 U	5 U	1.1 J	5 U	1.2 J	4 J	260	10000	5 U	2.5 J	5 U	0.4 U			8	141	120	23.8		
4/2/2014	1 U	1 U	1 U	0.92 J	1 U	1.2	3.5 J	280	8300	1 U	2	1 U	0.4 U			5.2	141	158	27.8		
10/14/2014	1 U	1 U	1 U	0.66 J	1 U	2.5	1.4 J	86	4200	1 UJ	1.2	1 U	0.4 U			5.3	143	160	11.1		
11/17/2015	1 U	1 U	0.56 J	0.57 J	1 U	1.7				1 U	1	1 U									
4/22/2016	1.0 U	1.0 U	0.54 J	0.76 J	1.0 U	9.7				1.0 U	1.7	1.0 U									
9/14/2017	1.0 U	1.0 U	1.1	1.0 U	1.0 U	6.5				1.0 U	0.95 J	1.0 U									
4/24/2018	1.0 U	1.0 U	0.65 J	0.74 J	1.0 U	1.9				1.0 U	1.9	1.0 U									

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U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-12A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	5 U	150	1.3 J	0.49 J	39				5 U	3.2 J	5 U									
4/22/2008	5 U	5 U	130	1 J	0.32 J	23				5 U	2 J	5 U									
11/2/2009	5 U	5 U	64	5 U	5 U	38				5 U	2.7 J	5 U									
5/11/2010	5 U	5 U	16	5 U	5 U	16	5 U	14	140	5 U	1.6 J	5 U									
10/20/2011	5 U	5 U	19	5 U	5 U	16				5 U	1.8 J	5 U									
6/13/2012	5 U	5 U	19	5 U	5 U	13				5 U	1.8 J	5 U									
8/29/2013	5 U	5 U	22	5 U	5 U	14	5.6	7.2	210	5 U	1.9 J	5 U		4.4 U	311	5.5	80.7	204	0.16 U	0.1 U	0.05 U
4/3/2014	1 U	1 U	8.9	1 U	1 U	6.8	5 U	2.4 J	140	1 U	0.89 J	1 U	0.962	4.7 U	15 J	5.6	69	179	0.16 U	0.14 J-	0.05 U
11/17/2015	1 U	1 U	1.6	1 U	1 U	9.6	5 U	5 U	140	1 U	0.7 J	1 U	2.27	3.8 U	26.7 J	7.7	63.6	119	0.079 J	0.1 U	0.05 U
4/22/2016	1.0 U	1.0 U	9.5	1.0 U	1.0 U	8.8	5.0 U	1.8 J	170	1.0 U	1.1	1.0 U	0.847	3.4 UJ	19.8 J	3.4	96	192	0.10 U	0.10 U	0.050 U
9/14/2017	1.0 U	1.0 U	21	0.34 J	1.0 U	13	0.31 J	2.7	210	1.0 U	1.6	1.0 U	1.5	2.0 U	49	4.2	330	650	1.0 U	1.0 U	0.050 U
4/24/2018	1.0 U	1.0 U	16	1.0 U	1.0 U	9.2	1.0 U	2	200	1.0 U	0.91 J	1.0 U	0.6	2.0 U	11	3.9	82	190	1.0 U	0.25 UJ	0.050 UJ

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UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-12B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/29/2007	5 U	5 U	110	1 J	5 U	76				5 U	1.8 J	5 U									
4/21/2008	5 U	5 U	140	1.6 J	0.31 J	70				5 U	1.6 J	5 U									
11/2/2009	5 U	5 U	2.6 J	5 U	5 U	5 U				5 U	5 U	5 U									
5/11/2010	5 U	5 U	11	5 U	5 U	5 U	5 U	5 U	15 U	5 U	5 U	5 U									
11/9/2010	5 U	5 U	59	5 U	5 U	71	1.2 J	3.3 J	120	5 U	5 U	5 U				3.2	149	312			
10/20/2011	5 U	5 U	0.98 J	5 U	5 U	5 U				5 U	5 U	5 U									
6/13/2012	5 U	5 U	5.6	5 U	5 U	10				5 U	5 U	5 U									
8/29/2013	5 U	5 U	45	5 U	5 U	73	5 U	15	160	5 U	5 U	5 U		4.2 U	17.9 J	4.1	143	230	0.093 J	0.1 U	0.05 U
4/3/2014	1 U	1 U	57	1 U	1 U	75	5 U	9.7	190	1 U	1 U	1 U	0.4 U	4.1 U	50 U	5.4	149	201	0.16 U	0.1 UJ	0.05 U
11/16/2015	1 U	1 U	13	1 U	1 U	9.1	5 U	5 U	25	1 U	1 U	1 U	0.111 J	4.7 U	22.1 J	9.2	148	244	0.16 U	0.2 J+	0.039 J
4/22/2016	1.0 U	1.0 U	73	1.0 U	1.0 U	59	5.0 U	2.6 J	200	1.0 U	1.0 U	1.0 U	0.0618 J	3.5 UJ	19.8 J	3	177	204	0.10 U	0.10 U	0.050 U
9/14/2017	2.0 U	2.0 U	52	2.0 U	2.0 U	110	0.45 J	3.9	140	2.0 U	0.66 J	2.0 U	0.032 J	2.0 U	17	2.7	280	530	1.0 U	0.50 U	0.050 U
4/25/2018	2.5 U	2.5 U	62	2.5 U	2.5 U	73	1.0 U	4.4	340	2.5 U	2.5 U	2.5 U	0.027 J	2.0 U	12	3.5	150	190	1.0 U	0.25 U	0.050 U
12/5/2019	2.5 U	2.5 U	65	2.5 U	2.5 U	94	0.89 J	5.3	210	2.5 U	2.5 U	2.5 U	0.20 U	2.0 U	10 U	2.8	150	240	1.0 U	0.25 U	

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-13A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/30/2007	5 U	5 U	5 U	5 U	5 U	2 U				5 U	5 U	5 U									
4/29/2008																					
10/29/2009	5 U	5 U	5 U	5 U	5 U	5 U				5 U	5 U	5 U									

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-13B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/30/2007	5 U	0.78 J	82	1.1 J	5 U	59				5 U	0.61 J	5 U									
4/24/2008	5 U	0.65 J	65	0.51 J	5 U	56				5 U	0.48 J	5 U									
10/29/2009	5 U	5 U	88	5 U	5 U	68				5 U	5 U	5 U									
5/13/2010	5 U	5 U	46	5 U	5 U	47	5 U	1 J	65	5 U	5 U	5 U									
10/21/2011	5 U	5 U	17	5 U	5 U	24				5 U	5 U	5 U									
6/13/2012	5 U	5 U	27	5 U	5 U	57				5 U	5 U	5 U									
8/30/2013	5 U	5 U	8.6	5 U	5 U	48				5 U	5 U	5 U									
4/3/2014	1 U	1 U	19	1 U	1 U	15				1 UJ	1 U	1 U									
11/17/2015	1 U	1 U	18	1 U	1 U	21				1 U	1 U	1 U									
4/21/2016	1.0 U	1.0 U	9.9	1.0 U	1.0 U	12				1.0 U	1.0 U	1.0 U									
9/13/2017	1.0 U	1.0 U	22	1.0 U	1.0 U	38				1.0 U	1.0 UJ	1.0 U									
4/24/2018	1.0 U	1.0 U	7.8	1.0 U	1.0 U	9.7				1.0 U	1.0 U	1.0 U									
12/3/2019	1.0 U	0.19 J	16	1.0 U	1.0 U	21				1.0 U	0.17 J	1.0 U									

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UJ The analyte was not detected. The reporting limit is an approximate value.
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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-14A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/30/2007	5 U	5 U	1.6 J	5 U	5 U	2.4				5 U	5 U	5 U									
4/24/2008	5 U	5 U	1.5 J	5 U	5 U	1.6 J	0.64 J	1 U	15	5 U	5 U	5 U		2 U	18.8	5.38	68	118	1 U	0.05 U	0.05 U
10/29/2009	5 U	5 U	1.4 J	5 U	5 U	2.7 J	5 U	5 U	17	5 U	5 U	5 U		1.4 U	21 J	4.2	63.9	150 J	0.16 U	0.28	0.05 U

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-14B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/30/2007	5 U	5 U	56	0.42 J	5 U	49	2 U	2 U	110	5 U	0.6 J	5 U		2 U	6.58 J	4.07	119	263	1 U		
4/24/2008	5 U	5 U	120	0.81 J	5 U	90	1 U	1.5 J	170	5 U	0.41 J	5 U		2 U	10.1	2.95	136	222	1 U	0.05 U	0.05 U
10/29/2009	5 U	5 U	64	5 U	5 U	86	5 U	2.2 J	130	5 U	5 U	5 U		2.1 U	23.3 J	3.5	133	310 J	0.5	0.1 U	0.05 U
5/13/2010	5 U	5 U	16	5 U	5 U	33	100 U	170	3400	5 U	5 U	5 U		53.6	137	14.6	143	103	46.9	0.1 U	0.05 U
10/24/2011	5 U	5 U	4.1 J	5 U	5 U	5.4	5 U	66	690	5 U	5 U	5 U	0.0264 J	5.2 U	36 J	7	260	274	3	0.1 U	0.05 U
6/13/2012	5 U	5 U	1.5 J	5 U	5 U	5.4	2.2 J	91	9100	5 U	5 U	5 U	0.027 J	33	117	10.2	241	126	48.2	0.1 U	0.05 U
8/29/2013	5 U	5 U	5 U	5 U	5 U	1.5 J				5 U	5 U	5 U									
4/3/2014	1 U	1 U	0.67 J	1 U	1 U	1.2				1 UJ	1 U	1 U									
11/18/2015	1 U	1 U	0.95 J	1 U	1 U	1.5				1 U	0.53 J	1 U									
4/21/2016	1.0 U	1.0 U	0.94 J	1.0 U	1.0 U	1.2				1.0 U	1.0 U	1.0 U									
9/14/2017	1.0 U	1.0 U	0.92 J	1.0 U	1.0 U	2.9				1.0 U	0.43 J	1.0 U									
4/24/2018	1.0 U	1.0 U	0.72 J	1.0 U	1.0 U	1.3				1.0 U	0.34 J	1.0 U									
12/5/2019	1.0 U	1.0 U	0.37 J	1.0 U	1.0 U	0.7 J				1.0 U	0.19 J	1.0 U									

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UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-15

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/30/2007	5 U	5 U	170	1.7 J	5 U	86				5 U	0.66 J	5 U									
4/23/2008	5 U	5 U	190	1.5 J	5 U	93				5 U	0.58 J	0.38 J									
11/3/2009	5 U	5 U	56	1.1 J	5 U	82				5 U	2 J	5 U									
5/12/2010	5 U	5 U	5.9	5 U	5 U	17	1.1 J	140	1300	5 U	1.3 J	5 U									
10/21/2011	5 U	5 U	32	1.3 J	5 U	52				5 U	1.4 J	5 U									
6/14/2012	5 U	5 U	5 U	5 U	5 U	1.8 J				5 U	1.2 J	5 U									
8/29/2013	5 U	5 U	5 U	5 U	5 U	2 J				5 U	5 U	5 U									
6/14/2018	1.0 U	1.0 UJ	5.2	0.62 J	1.0 U	16				1.0 U	1.1	1.0 U									

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UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-16A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	0.39 J	12	5 U	5 U	160	0.87 J	15	18	5 U	5 U	5 U		2 U	23.2 J	6.93	278	981	1.2		
4/25/2008	5 U	0.39 J	9	5 U	5 U	53	1 U	0.62 J	4.5	5 U	5 U	5 U		2 U	20.4	6.5	209	1020	1 U	0.05 U	0.05 U
10/27/2009	5 U	5 U	8.2	5 U	5 U	75	5 U	4.7 J	11 J	5 U	5 U	5 U		1.7 U	41.6 J	7.2	247 J	1060	0.16 U	0 R	0.05 U
5/11/2010	5 U	5 U	10	5 U	5 U	180	5 U	20	20	5 U	5 U	5 U		2 U	40.7 J	7	260	1040	0.16 U	0.1 U	0.05 U
10/27/2011	5 U	5 U	11	5 U	5 U	340	5 U	44	33	5 U	5 U	5 U	0.0424 J		31.5 J	6.9	266	1130	0.16 U	0.1 U	0.05 UJ
3/14/2012																					
3/15/2012	5 U	5 U	7.2	5 U	5 U	12	5 U	1.3 J	15 U	5 U	5 U	5 U	0.044 J			8.1	245	1110			
6/14/2012	5 U	5 U	8.4	5 U	5 U	110	5 U	11	8.7 J	5 U	5 U	5 U	0.2 U	5.4	26.5 J	9.5	237	1100			
11/29/2012	5 U	5 U	10	5 U	5 U	330	1.2 J	79	40	5 U	5 U	5 U	0.2 U			7.7	255	1100			
8/29/2013	5 U	5 U	8.5	5 U	5 U	300	1.1 J	72	29	5 U	5 U	5 U		3.8 U	31.5 J	8.2	252	1080	0.16 U	0.1 U	0.05 U
1/15/2014	5 U	5 U	9	5 U	5 U	78	5 U	6.4	5 U	5 U	5 U	5 U	0.4 U			9.5	190 J+	812 J+	0.16 U		
4/2/2014	1 U	1 U	5.9	1 U	1 U	140	5 U	20	5 U	1 U	1 U	1 U	0.4 U	4.4 U	24.1 J	7.3	214	898	0.16 U	0.1 U	0.14
10/14/2014	1 U	1 U	8.6	1 U	1 U	350	5 U	52	9.5	1 UJ	1 U	1 U	0.491			9.1	221	958	0.16 U		
11/20/2015	1 U	1 U	9.1	1 U	1 U	250	1.2 J	95	49	1 U	1 U	1 U	0.4 U	5.2 U	33.6 J	6.5	290	1080	0.16 U	0.1 U	0.05 U
4/20/2016	1.0 U	1.0 U	6.5	1.0 U	1.0 U	18	5.0 U	1.1 J	5.0 U	1.0 U	1.0 U	1.0 U	0.400 U	2.9 U	33.6 J	6.2	907	1140	0.10 U	0.14	0.050 U
9/12/2017	10 U	10 U	7.3 J	10 U	10 U	190	0.47 J	33	28	10 U	10 U	10 U	0.100 U	2.0 U	28	6.4	250	1000	1.0 U	0.50 U	0.050 UJ
4/26/2018	1.0 U	1.0 U	1.4	1.0 U	1.0 U	33	1.0 U	13	12	1.0 U	1.0 U	1.0 U	0.026 J	2.0 U	17 J	5.8	48	190	1.0 U	0.21 J	0.050 U
12/3/2019	4.0 U	0.6 J	3.6 J	4.0 U	4.0 U	120	1	49	77	4.0 U	4.0 U	4.0 U	0.20 U	2.0 U	18	6.1	170	810	1.0 U	0.50 U	

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UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-16B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	210	0.88 J	5 U	63	1 U	3.7	190	5 U	5 U	5 U		2 U	5 UJ	3.7	114	269			
11/29/2007																			1 U		
4/25/2008	5 U	0.25 J	280	1.4 J	0.33 J	86	0.7 J	3.1	220	5 U	0.22 J	5 U		2 U	10.1	3.81	106	264	1.1	0.05 U	0.05 U
10/27/2009	5 U	5 U	510	1.8 J	5 U	130	5 U	3.2 J	150	5 U	5 U	5 U		1.8 U	18.8 J	3.7	120 J	286	0.22	0 R	0.05 U
5/11/2010	5 U	5 U	81	5 U	5 U	48	5 U	2.3 J	150	5 U	5 U	5 U		2.1 U	15.6 J	3.8	105	247	0.3	0.1 U	0.05 U
11/8/2010	5 U	5 U	320	1.4 J	5 U	110	5 U	5 U	120	5 U	5 U	5 U				3.7	114	264			
10/25/2011	5 U	5 U	27	5 U	5 U	43	5 U	3.8 J	140	5 U	5 U	5 U	0.2 U	2.6 U	50 U	3.5	134 J	303 J	0.38	0.1 U	0.05 U
3/15/2012	50 U	45 J	9000	36 J	23 J	830	3.1 J	73	2400	50 U	50 U	50 U	0.0585 J			17.5	78.4	96.6			
6/13/2012	10 U	74	4700	19	15	600	2.5 J	74	2600	10 U	4 J	2.6 J	0.2 U	24.6	65.1	4.1	81.5	165	33.1	0.1 U	0.05 U
11/27/2012	50 U	430	6800	24 J	29 J	820	5.6	190	3600	50 U	50 U	50 U	0.0908 J			3.5	82.8	191			
8/28/2013	5 U	2.2 J	600	5.2	2.4 J	610	5 U	75	670	5 U	1 J	5 U		5.1 U	15.6 J	3.8	90.1 J	219	1.1	0.1 U	0.05 U
1/14/2014	25 U	25 U	8800	53	17 J	5500	15	1500	18000	25 U	15 J	25 U	0.214 J			194	44.8	5 U	50.9		
4/3/2014	5 U	5 U	2300	16	5.5	2000	11	700	16000	5 U	3.4 J	5 U	0.0956 J	140	253	69.2	26.9	17.7	38.3	0.1 UJ	0.05 U
10/13/2014	1 U	1 U	17	8.8	1 U	22	13	610	21000	1 U	2.9	1 U	0.372 J			211	43.3	21.6	17.2		
11/20/2015	1 U	4.8	1100	22	2.2	780	40	920	24000	1 U	6.6	1 U	0.4 U	105	215	47.3	70.6	4.2	36.5	0.1 U	0.05 UJ
4/20/2016	1.0 U	1.0 U	1.0 U	6.8	1.0 U	4.3	17	300	31000 D	1.0 U	2	1.0 U	0.400 U	62.4	201	26.5	73.8	8.2	50.5	0.10 U	0.050 U
9/12/2017	1.0 U	1.0 U	1.0 U	0.44 J	1.0 U	2.6	15	34	8200 D	1.0 U	0.39 J	1.0 U	0.100 U	39	99	6.8	120	120	29	0.25 U	0.050 UJ
4/26/2018	1.0 U	1.0 U	0.63 J	1.0 U	1.0 U	4.6	1.0 U	2.8	9900 D	1.0 U	1.0 U	1.0 U	0.200 U	13	49	5.7	120	230	6.9	0.25 U	0.050 U
12/3/2019	1.0 U	1.0 U	1	1.0 U	1.0 U	6.7	4.2	17	9300 D	1.0 U	1.0 U	1.0 U	0.20 U	14	25	4	110	220	9.5	0.25 U	

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D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-17A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	38	160	1.9 J	10	12	1 U	0.42 J	60	5 U	19	5 U		2 U	11.4 J	2.51	1400	134	1 U		
4/28/2008	5 U	29	200	1.5 J	9.1	28	1 U	1.5	77	5 U	20	5 U		2 U	11	2.2	1120	153	1 U	0.05 U	0.05 U
8/12/2008	5 U	40	190	2.5 J	11	24	5 U	1.5 J	120	5 U	21					2.4	1250	168			
10/7/2008	5 U	43	200	3.5 J	13	23	5 U	1.3 J	120 J	5 U	23	5 U				2.2	1270 J	165			
12/10/2008	5 U	39	210	2.2 J	12	27	5 U	1.1 J	65	5 U	25	5 U				2.2	1070	161			
1/26/2009	5 U	32	210	2.1 J	11	29	5 U	1.4 J	88	5 U	23	5 U									
3/16/2009	5 U	29	210	2.5 J	12	28	5 U	1.4 J	78	5 U	20	5 U				2.3	1220	170			
10/20/2009	5 U	24	200	2.2 J	14	24	5 U	5 U	120	5 U	29	5 U				3.1	1080 J	198 J			
10/28/2009	5 U	22	180	1.6 J	14	25	5 U	5 U	97	5 U	30	5 U		1.9 U	59.9 J	2.9	1130 J	192	0.16 U	0 R	0.05 U
12/11/2009	5 U	11	200	1.4 J	13	29	5 U	5 U	100	5 U	28	5 U				3.1	1060 J	217 J			
2/9/2010	5 U	14	210	1.3 J	11	34	5 U	5 U	110	5 U	24	5 U				3.7 J	962	194			
3/30/2010	5 U	11	180	1.7 J	10	24				5 U	20	5 U									
5/6/2010	5 U	15	210	1.4 J	11	27	5 U	5 U	15 U	5 U	20	5 U		3.6 U	29.3 J	2.9	729 J	196 J	0.16 U	0.1 U	0.05 U
11/11/2010	5 U	16	200	1.9 J	13	28	1.5 J	8.5	2100	5 U	27	5 U				3.1	661	195			
10/24/2011	5 U	11	160	1.2 J	12	30	11	3.2 J	4900	5 U	26	5 U	0.2 U	5.1	33.8 J	3.9	1010	189	0.16 U	0.1 U	0.05 U
6/12/2012	5 U	5.3	140	1.2 J	8.1	25	12	3.1 J	8500	5 U	21	5 U	0.2 U	5.9	28.8 J	4.4	484	172	0.16 U	0.1 U	0.05 U
8/28/2013	5 U	3.1 J	180	5 U	6.3	45	11	8.8	12000	5 U	22	5 U		9.8	27 J	3.8	318 J	151	0.16 U	0.1 U	0.05 U
4/3/2014	1 U	0.62 J	150	1 U	3.6	49	14	17	18000	1 UJ	16	1 U	2.14	8.5	49.3 J	5.1	277	145	0.16 U	0.1 UJ	0.05 U
11/18/2015	1 U	1 U	160	1 U	1 U	86	12	11	15000	1 U	18	1 U	1.45	7.3	15.2 J	3	167	114	0.16 U	0.1 U	0.05 U
4/20/2016	1.0 U	1.0 U	110	1.0 U	1.0 U	89	7.4	11	15000 D	1.0 U	15	1.0 U	0.955	7.8	26.7 J	3.2	161	131	0.10 U	0.10 U	0.050 U
9/12/2017	5.0 U	5.0 U	120	5.0 U	5.0 U	120	5.5	8.4	3700 D	5.0 U	17	5.0 U	0.92	3.4	17	3	82	97	1.0 U	0.25 U	0.050 UJ
4/25/2018	5.0 U	5.0 U	59	5.0 U	5.0 U	91	10 U	10 U	13000	5.0 U	11	5.0 U	1	4.8 J	19	3.7	92	100	1.0 U	0.25 U	0.050 U
12/5/2019	2.0 U	2.0 U	50	2.0 U	2.0 U	83	11	17	9400 D	2.0 U	13	2.0 U	0.55	4.2	10 U	2.8	57	67	1.0 U	0.25 U	

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UJ The analyte was not detected. The reporting limit is an approximate value.
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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-17B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	4 J	440	3.4 J	3.4 J	64	0.66 J	2.8	180	5 U	9.3	5 U		2 U	9.7 J	3.31	431	209	1 U		
4/28/2008	5 U	4.6 J	630	8.5	5.5	82	0.53 J	4	160	5 U	17	5 U		2 U	10.4	3.06	475	211	1 U	0.05 U	0.05 U
10/8/2008	5 U	3.3 J	600	5.9	4.4 J	120	5 U	6.6	170 J	5 U	22	5 U				55.7	561 J	169			
12/10/2008	5 U	2.6 J	260	3.1 J	2.9 J	170	5 U	33	120	5 U	28	5 U				3	802	180			
1/26/2009	5 U	2.1 J	280	4.2 J	3.1 J	210	5 U	61	130	5 U	24	5 U									
3/17/2009	5 U	1.6 J	270	3.6 J	3.2 J	180	5 U	71	180	5 U	22	5 U				3.5	631	275			
10/20/2009	5 U	4.2 J	280 J	2.4 J	4.5 J	73	3 J	22	120	5 U	29	5 U				3	768 J	204 J			
10/28/2009	5 U	3.1 J	280	2.2 J	3.1 J	69	2 J	14	89	5 U	26	5 U		2.2 U	53.1 J	3.1	720 J	195	0.1 J	0 R	0.05 U
12/11/2009	5 U	2.2 J	170	2.4 J	5 U	160	2.4 J	130	300	5 U	8.4	5 U				264	171 J	18.3 J			
2/9/2010	5 U	1.2 J	31	1.8 J	5 U	52	4.2 J	190	4400	5 U	31	5 U				122 J	727	32.2			
3/30/2010	5 U	5 U	5.9	1.7 J	5 U	10				5 U	37	5 U									
5/6/2010	5 U	5 U	8.5	1.4 J	5 U	9.6	5 U	5 U	15 U	5 U	45	5 U		157 J	219	12.7	883 J	49.7 J	14.3	0.1 U	0.05 U
11/10/2010	5 U	5 U	8.1	0.86 J	5 U	8.8	16	110	4200	5 U	40	5 U				4.5	981	118			
10/26/2011	5 U	5 U	19	0.82 J	5 U	27	70	81	15000	5 U	48	1.4 J	0.102 J	5.7	45.1 J	3.2	966	154 J	4.5	0.1 U	0.05 U
3/13/2012	5 U	5 U	14	1.1 J	5 U	15	44	83	18000	5 U	46	1.3 J	0.0442 J			10.9	682	118			
6/12/2012	5 U	5 U	20	0.82 J	5 U	18	45	72	23000	5 U	43	1.5 J	0.19 J	9.6	49.2 J	3.8	739	116	11.6	0.1 U	0.05 U
11/27/2012	5 U	5 U	28 J	5 U	5 U	31	41	79	19000	5 U	35 J	5 U	0.172 J			3.2	669	130			
8/28/2013	5 U	5 U	35	5 U	5 U	40	29	56	19000	5 U	38	5 U		12.7	40.6 J	3.6	521 J	138	1.2	0.1 U	0.05 U
1/15/2014	5 U	5 U	1.8 J	1.5 J	5 U	2.9 J	7.2	52	19000	5 U	7.9	11	54.8			454	351 J+	5 U	6.3		
4/1/2014	1 U	1 U	1.3	0.73 J	1 U	2.1	13	34	20000	1 U	8.2	7.4	16.6	139	228	55.1	288	6.9	8.2 J-	0.1 U	0.016 J
10/14/2014	1 U	1 U	0.52 J	0.71 J	1 U	1.1	8.3	17	16000	1 UJ	3.3	8.2	15.5			38.4	386	5 U	4.1		
11/18/2015	1 U	1 U	1 U	1 U	1 U	0.8 J	8.5	8.9	14000	1 U	1.5	7.9	13.4	17.6	102	18.8	374	2.5 J	1.4	0.1 U	0.05 U
4/21/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.88 J	8	7	18000 D	1.0 U	1.7	6.7	17.3	20.4	103	25	327	7.2	1	0.10 U	0.050 U
9/12/2017	1.0 U	0.68 J	10	0.45 J	1.0 U	12	3.5	4.6	6800	1.0 U	6.3 J	7.6	5.3	6.2	78	17	210	47	0.73 J	0.50 U	0.050 UJ
4/25/2018	1.0 U	1.0 U	4.9	0.39 J	1.0 U	7.9	19	27	22000	1.0 U	4.5	3.7	4.7	6.8	89	20	170	45	2.1	0.25 U	0.039 J
12/5/2019	1.0 U	1.0 U	11	0.28 J	1.0 U	14	24	17	27000 D	1.0 U	4.3	6.6	3.1	9.7 J-	19	5.9	140	67	2.3	0.25 U	

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J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-18A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	22	25	0.46 J	0.58 J	6.7	0.38 J	1 U	17	5 U	4.1 J	5 U		2 U	5 UJ	1.79	74.2	125	1 U		
4/28/2008	5 U	25	31	0.44 J	0.8 J	2.1 J	1 U	1 U	16	5 U	3.8 J	5 U		2 U	5 U	1.56	79.6	133	1 U	0.05 U	0.05 U
10/27/2009	5 U	25	43	5 U	0.93 J	7	5 U	5 U	23	5 U	4.7 J	5 U		1.4 U	14.2 J	1.5	90.2 J	130	0.16 U	0 R	0.05 U
5/12/2010	5 U	25	51	5 U	1.1 J	2.6 J	5 U	5 U	13 J	5 U	4.2 J	5 U		1.6 U	50 U	2.1	104 J	132	0.16 U	0.1 U	0.05 U
10/24/2011	5 U	23	42	5 U	0.9 J	8.4	5 U	5 U	19	5 U	4.7 J	5 U	0.0478 J	2.1 U	50 U	1.8	293	156	0.16 U	0.1 U	0.05 U
6/12/2012	5 U	21	56	0.94 J	1.1 J	2.4 J	5 U	5 U	11 J	5 U	4.2 J	5 U	0.2 U	3.1 U	50 U	1	108	129	0.16 U	0.1 U	0.05 U
8/27/2013	5 U	25	58	0.87 J	0.98 J	3.4 J	5 U	5 U	10	5 UJ	4.9 J	5 U		6.2	50 U	2.1	118	138	0.16 U	0.1 U	0.05 U
4/2/2014	1 U	27	43	0.76 J	0.9 J	0.86 J	5 U	5 U	3.4 J	1 UJ	3.6	1 U	0.89	3.3 U	50 U	2.4	106 J-	124 J+	0.16 U	0.1 U	0.05 U
11/18/2015	1 U	38	51	0.73 J	1.1	2.3	5 U	5 U	11 J	1 U	4.5	1 U	1.5	2.8 U	50 U	1.2	113	118	0.16 U	0.1 U	0.05 U
4/20/2016	1.0 U	37	51	0.83 J	0.99 J	0.62 J	5.0 U	5.0 U	5.2	1.0 U	4.3	1.0 U	0.463	4.2 U	19.8 J	1.4	233	144	0.10 U	0.10 U	0.050 U
9/13/2017	2.0 U	29	58	0.8 J	1 J	1.8 J	0.50 U	0.50 U	5.3	2.0 U	5	2.0 U	1.2	2.0 U	12	1.3	86	120	1.0 U	0.25 U	0.050 U
4/26/2018	1.0 U	36	42	0.61 J	0.88 J	1.1	1.0 U	1.0 U	13	1.0 U	3.7	1.0 U	0.99	2.0 U	12	1.5	81	130	1.0 U	0.25 U	0.050 U
12/4/2019	2.0 U	32	43	0.66 J	0.93 J	0.97 J	0.36 J	1.0 U	9.2	2.0 U	3.6	2.0 U	0.9	2.0 U	10 U	1.3	67	130	1.0 U	0.25 U	

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D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-18B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
11/1/2007	5 U	5 U	160	0.9 J	5 U	140		2.1	120	5 U	5 U	5 U		2 U	5 UJ	4.09	80.9	261			
11/29/2007																			1 U		
4/28/2008	5 U	5 U	120	0.73 J	5 U	180	0.74 J	2.4	150	5 U	5 U	5 U		2 U	9.86	3.74	88.1	270	1 U	0.05 U	0.05 U
10/27/2009	5 U	5 U	62	5 U	5 U	220	5 U	2.3 J	120	5 U	5 U	5 U		1.7 U	23.3 J	4.1	93.8 J	296	0.16 U	0 R	0.05 U
5/12/2010	5 U	5 U	69	5 U	5 U	190	5 U	2.4 J	130	5 U	5 U	5 U									
10/25/2011	5 U	5 U	150	0.9 J	5 U	220	5 U	4 J	120	5 U	5 U	5 U	0.0657 J	2.4 U	50 U	3.9	114 J	305 J	0.16 U	0.1 U	0.05 U
3/14/2012	5 U	5 U	59	5 U	5 U	170	5 U	2.3 J	96	5 U	5 U	5 U	0.0423 J			3.5	102	281			
6/12/2012	5 U	5 U	110	5 U	5 U	140	5 U	3.6 J	110	5 U	5 U	5 U	0.2 U	3.5 U	50 U	4	102	268	0.16 U	0.1 U	0.05 U
11/28/2012	5 U	5 U	89	5 U	5 U	180	5 U	5.2	150	5 U	5 U	5 U	0.2 U			4.2	106	284			
8/15/2013	0.96 J	5 U	120	5 U	5 U	190				5 U	5 U	5 U							0.16 U		
8/27/2013	5 U	5 U	110	5 U	5 U	190	5 U	5.3	170	5 UJ	5 U	5 U		2.8 U	17.9 J	4.9	106	284	0.16 U	0.1 U	0.05 U
1/17/2014	5 U	5 U	28	5 U	5 U	56	3.2 J	41	5000	5 U	5 U	5 U	5.97			941	91.1	55.1	17.3		
1/21/2014																					
4/2/2014	1 U	1 U	43	1 U	1 U	71	3.8 J	33	13000	1 UJ	1 U	1 U	2.91	889 J	1340	427	79.3 J-	86.1 J+	7.7	0.1 U	0.05 U
10/13/2014	1 U	1 U	1.1	1 U	1 U	4.6	4 J	11	18000	1 U	1 U	1 U	8.37			166	34.9	3.8 J	2.8		
11/18/2015	1 U	1 U	35	1 U	1 U	40	3.5 J	15	18000	1 U	1 U	1 U	2.54	35.7	167	41.5	62.2	70.9	1.5	0.1 U	0.05 U
4/21/2016	1.0 U	1.0 U	90	1.0 U	1.0 U	120	2.8 J	16	19000 D	1.0 U	1.0 U	1.0 U	0.893	22.1	88.7	21.7	122	189	4.8	0.10 U	0.050 U
9/13/2017	20 U	20 U	380	20 U	20 U	210	6.8	38	5000 D	20 U	20 UJ	20 U	0.52	23	99	11	110	140	7.3	0.50 U	0.050 U
4/26/2018	2.5 U	2.5 U	69	2.5 U	2.5 U	92	2	12	17000 D	2.5 U	2.5 U	2.5 U	0.41	17	71	12	97	130	10	0.25 U	0.050 U
12/4/2019	2.0 U	2.0 U	56	2.0 U	2.0 U	70	2.3	9.9	24000 D	2.0 U	2.0 U	2.0 U	0.35	35 J-	49	8.8	96	130	13	0.25 U	

J Indicates an estimated value.
U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-19A

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	4.2 J	5 U	5 U	4				5 U	5 U	5 U									
4/24/2008	5 U	5 U	3.2 J	5 U	5 U	1.2 J				5 U	5 U	5 U									
11/2/2009	5 U	5 U	3.7 J	5 U	5 U	2.8 J				5 U	5 U	5 U									

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U Analyte was not detected above the reporting limit.
UJ The analyte was not detected. The reporting limit is an approximate value.
J- Indicates estimated value, biased low.
J+ Indicates estimated value, biased high.
D Result reported from a secondary dilution analysis.
R The sample results are rejected.

MONITORING WELL GROUNDWATER ANALYTICAL RESULT SUMMARY
HYDE PARK FACILITY
NIAGARA, NEW YORK

Well ID: MW-19B

Date	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE (µg/L)	Trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	Chloroethane (µg/L)	Dissolved Iron (mg/L)	BOD (mg/L)	COD (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
10/31/2007	5 U	5 U	12	5 U	5 U	3.4				5 U	5 U	5 U									
4/24/2008	5 U	5 U	24	5 U	5 U	5.8				5 U	5 U	5 U									
11/2/2009	5 U	5 U	68	5 U	5 U	7.2				5 U	5 U	5 U									
5/12/2010	5 U	5 U	2.1 J	5 U	5 U	2.1 J	5 U	5 U	160	5 U	5 U	5 U									
10/20/2011	5 U	5 U	8.7	5 U	5 U	3.3 J				5 U	5 U	5 U									
6/12/2012	5 U	5 U	2.3 J	5 U	5 U	1.6 J				5 U	5 U	5 U									
8/28/2013	5 U	5 U	2.1 J	5 U	5 U	1.2 J				5 U	5 U	5 U									
4/2/2014	1 U	1 U	2.9	1 U	1 U	0.65 J				1 U	1 U	1 U									
11/17/2015	1 U	1 U	1.8	1 U	1 U	1				1 U	1 U	1 U									
4/19/2016	1.0 U	1.0 U	1.1	1.0 U	1.0 U	1.1				1.0 U	1.0 U	1.0 U									
9/13/2017	1.0 U	1.0 U	1.6	1.0 U	1.0 U	1.5				1.0 U	1.0 UJ	1.0 U									
4/23/2018	1.0 U	1.0 U	24	1.0 U	1.0 U	5				1.0 U	1.0 U	1.0 U									
12/4/2019	1.0 U	1.0 U	1.4	1.0 U	1.0 U	1.2				1.0 U	1.0 U	1.0 U									

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D Result reported from a secondary dilution analysis.
R The sample results are rejected.