



2021 Periodic Review Groundwater Monitoring and Sampling Annual Report

**815 River Road Site
Site Number B00178
City of North Tonawanda**

Prepared for:
City of North Tonawanda
February 28, 2022

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1. Site Background

1.1 Site Location and History

This one-acre parcel of land is located directly across from the City of North Tonawanda (City) Wastewater Treatment Plant (WWTP). The City acquired the 815 River Road parcel in 2000 through tax foreclosure. Prior to the City's acquisition of the property, a company that maintained school buses occupied this property. As part of this business, this company maintained fueling systems that included underground storage tanks (USTs) for gasoline and motor oil. City records indicated that the USTs were in place for over 40 years. Presently, the property is owned by Metzger Removal, Inc. as a C&D crushing/recycling operation. A Site location map is presented on Figure 1.

A previous Site investigation completed in January 2001 by Green Environmental Specialists, Inc. (Green) identified seven buried USTs. Analytical testing detected the presence of benzene in two USTs. Site reporting also indicated that the soil and groundwater surrounding the USTs may have been impacted through UST leakage. Shortly after the completion of Green's Site investigation, remedial construction was initiated by a private entity interested in remediating and developing the property for commercial/industrial use. Remedial activities resulted in the removal of four USTs.

In September 2002, an additional Site investigation was completed by Parsons Corporation to delineate the extent of contamination and provide tank closure of the four removed USTs from past remedial activities. The Site investigation identified an additional eight USTs.

1.2 Site Remediation Activities

Under a Site Interim Remedial Measure (IRM), UST removal and closure was provided. Demolition of an on-site building was necessary for proper UST closure and to allow access to impacted soils beneath the building. Impacted soils were excavated and removed from the Site for disposal to Tonawanda Landfill. During the removal of impacted soils and surface water, IRM construction was halted by the City due to a contract dispute. All Site activities were discontinued. Contract disputes could not be settled and construction contracts were terminated. The Site was left with an unfinished open excavation with the potential for additional impacted soils to be excavated. Reporting for the Site investigation and IRM activities was not provided to the City.

Stearns & Wheler, LLC was retained by the City to provide engineering services for an IRM that was conducted in November 2007 that included the excavation and disposal of 1,300 tons of impacted and staged soils. This IRM construction completed the excavation and removal of impacted soils that was halted by the City in 2004. The excavation followed the delineation of impacted soils as defined during the Site investigation. The removal of impacted soils extended to the south to a minor extent onto the adjacent property. IRM excavation limits were brought to within approximately 5-feet of the River Road Right-of-Way (ROW). Depth of excavation limits was to the top of clay. Excavated impacted soils were pre-approved for disposal at Modern Landfill and directly loaded into trucks from the excavation. No soils were staged on site. Confirmatory soil samples were collected from the previously impacted area. After confirmatory soil sampling, analytical test results were reported below the Restricted Commercial Use Soil Cleanup Objectives, and the excavation was backfilled.

1.3 Site Investigation/Remedial Alternatives Report

Stearns & Wheler, LLC was retained by the City to provide engineering services and perform a Site Investigation/Remedial Alternatives Report (SI/RAR). The SI/RAR was completed in January 2008 and selected institutional controls for both impacted soils and groundwater media. The completed 2007 IRM achieved the SI/RAR reported Restricted Commercial Soil Cleanup Objectives.

1.4 Institutional and Engineering Controls

Institutional controls were recommended as the most feasible and selected alternative as reported in the SI/RAR dated January 2008 and included the environmental easement for future redevelopment and ownership of the Site. The Site Management Plan (SMP) addresses the excavation procedures for the remaining soils for future redevelopment, and includes soil management, characterization, and disposal of excavated soils in accordance with the applicable New York State Department of Environmental Conservation (NYSDEC) regulations. The SMP is presented in Section 4.

In addition, the environmental easement imposes a deed restriction that requires compliance with the approved SMP and limits the future use of groundwater from the Site. Installation of potable wells at the Site is prohibited, as is any future use of groundwater at the Site. Annually, future owners are required to certify to the NYSDEC that the implemented remedy has been maintained in accordance with the SMP.

2. Groundwater Monitoring Activities

The Monitoring Plan includes the necessary actions required to maintain the Site. This Monitoring Plan includes a description of a long term environmental monitoring program, specific information on all of the equipment and materials used in any monitoring systems, contingencies for emergencies, and reporting requirements.

2.1 Site Hydrogeology

The presence of the Niagara River located to the west of the Site suggests that the river will act as the regional discharge zone. Locally, however, groundwater is possibly intercepted by the 36-inch diameter sanitary sewer line located along River Road. The top of the silty clay unit that is consistent throughout the Site has been logged and reported to range in depth between 4 to 5-feet. Standard sewer construction consists of a sewer pipe laid on gravel bedding material with the rest of the sewer trench filled with a gravel backfill. Since the sanitary sewer located along River Road is approximately 15-feet deep, the bottom of the sewer trench is deeper than the top of the silty clay unit. Any groundwater migrating from the Site should follow the top of clay and infiltrate into the gravel backfilled sewer trench. Once in the trench, groundwater can enter the sewer through infiltration and be transmitted to the City's WWTP for treatment.

2.2 Monitoring Requirements

Annual monitoring is performed at the Site. Groundwater monitoring was initially conducted after the remediation was completed and thereafter on an annual basis upon NYSDEC request. Methods used are consistent with NYSDEC requirements.

2.3 Groundwater Monitoring

The 2021 monitoring program at the 815 River Road Site consisted of one annual sampling event. Groundwater was sampled from monitoring wells MW-1 and MW-2 on July 23, 2021. The locations of groundwater monitoring wells MW-1 and MW-2 are approximately 10-feet from the River Road curb line at the 815 River Road property. This sampling event represents the 8th event of the groundwater monitoring program. A Site plan is presented on Figure 2.

Groundwater sampling of monitoring wells MW-1 and MW-2 were collected using low-flow purging and sampling techniques. Prior to sampling, the monitoring well was purged using a disposable bailer. Groundwater parameters of pH, specific conductance, dissolved oxygen (DO), temperature, and oxidation-reduction potential (ORP) were recorded. After the field parameters were recorded, groundwater samples were collected with a disposable bailer and transferred into sample containers provided by the testing laboratory. Groundwater elevation data was recorded.

Purge water generated from monitoring wells MW-1 and MW-2 were discharged to the ground. Groundwater Field Sampling Records are presented in Appendix A.

Several quality control samples, including a trip blank, field duplicate, and MS/MSD were collected during the sampling event. Samples were delivered under chain of custody to EurofinsTestAmerica for analysis of Volatile Organic Compounds (VOCs) by USEPA SW-846 Method 8260. The specific sampling protocol to be used, including sample preservation techniques, QA/QC objectives, a description of chain-of-custody documentation, and analytical parameters are included in the SMP.

3. Groundwater Monitoring Results

3.1 2021 Groundwater Monitoring

This section presents the analytical results of the annual groundwater sampling event performed on July 23, 2021 and represents groundwater monitoring for the 2021 reporting year. Analytical results are presented in Table 1 and the laboratory report is presented in Appendix B. Sampling field parameters are presented in Table 2. Included in this section are descriptions of the identification and distribution of constituents present in groundwater, and a comparison of historical data. Constituents are compared to the applicable NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Groundwater Standards and Guidance Values.

Table 3 Field Groundwater Parameters

Parameter	Monitoring Well Location	
	MW-1	MW-2
Temperature (°C)	17.4	19.2
pH	7.21	7.49
Conductivity (mS/cm)	2.57	2.26
Dissolved Oxygen (mg/L)	1.43	2.00
Turbidity (NTUs)(1)	1.49	1.90
ORP (mV)	-168.2	-198.4

The Data Usability Summary Report is presented in Appendix C. The QA/QC measurements examined for the data were within method-specified or laboratory-derived limits. No data were rejected as a result of the data validation.

Groundwater in the southwest corner of the Site has been impacted with concentrations of VOCs. VOC concentrations were detected in groundwater collected from monitoring wells MW-1 and MW-2 that exceed groundwater standards. VOC concentrations detected in groundwater from the sampling conducted in 2007, 2012, 2015, 2016, 2017, 2019, 2020, and the 2021 sampling event completed on July 23, 2021 were compared to determine a trending analysis.

3.2 Monitoring Well MW-1 Test Results

Groundwater analytical results from monitoring well MW-1 detected the following total VOC concentrations from 2007, 2012, 2015, 2016, 2017, 2019, 2020, and 2021.

2007	6.0 µg/L
2012	148.0 µg/L
2015	28.0 µg/L
2016	57.3 µg/L
2017	112.8 µg/L
2019	74.3 µg/L
2021	138 µg/L

Groundwater monitoring for the reporting years of 2012, 2015, 2016, 2017, 2019, and 2021 detected VOC concentrations that exceeded the groundwater standard for the following parameters: ethylbenzene and isopropylbenzene. A trending graph shows fluctuating VOCs concentrations since 2012 as presented on Figure 3.

Concentrations of cyclohexane were detected in 2012, 2016, 2017, and 2019, and 2021. Concentrations of methylcyclohexane were detected in 2012 and 2017. No groundwater quality standard is established for cyclohexane and methylcyclohexane.

3.3 Monitoring Well MW-2 Test Results

Groundwater test results from monitoring well MW-2 detected the following total VOC concentrations from 2007, 2012, 2015, 2016, 2017, 2018, 2019, and 2021.

2007	1,230.0 µg/L
2012	3,345.0 µg/L
2015	1,866.1 µg/L
2016	3,474.3 µg/L
2017	2,771.1 µg/L
2019	3,539.7 µg/L
2020	2,407.3 µg/L
2021	3,536.5 µg/L

Groundwater monitoring for the reporting years of 2012, 2015, 2016, 2017, 2019, 2020, and 2021 detected VOC concentrations that exceeded the groundwater standard. A trending graph shows a generally stable/decreasing trend of detected VOCs with the exception of total ethylbenzene as presented on Figure 4.

Concentrations of cyclohexane were detected in 2015, 2016, 2017, 2019, 2020, and 2021. Concentrations of methylcyclohexane were detected in 2015, 2016, 2017, 2019, 2020, and 2021. No groundwater quality standard is established for cyclohexane and methylcyclohexane.

4. Soil Management Plan

The objective of the SMP is to set guidelines for management of soil material during any future activities, which would breach the cover system at the Site. The SMP addresses environmental concerns related to soil management and has been reviewed and approved by the NYSDEC.

4.1 Nature and Extent of Contamination

Based on data obtained from previous investigations and the IRM remediation completed at the Site, a Final Engineering Report for the 815 River Road Site Remediation dated June 2008 was completed by Stearns & Wheler, LLC.

During Site investigation activities, impacted soils were identified. The impacted soil area was excavated, removed, and disposed off-Site during an IRM completed in 2007. Impacted soils were sampled and categorized to preliminarily delineate the extent of the contamination and for waste characterization for off-Site disposal. The impacted soils were excavated to the top of clay which was defined ranging between 9 to 11 feet.

The impacted soil contained concentrations of both volatile and semi-volatile compounds. All concentrations reported during the 2007 IRM were below the Restricted Commercial Use Soil Cleanup Objectives. VOC parameters with the highest concentrations included xylene and ethylbenzene. Semi-volatile compounds were detected to a lesser degree including naphthalene. The potential exposure pathways include inhalation, absorption, ingestion, and contact. Health effects from exposure to these chemical compounds are eye, skin, and respiratory irritants.

The constituents of potential concern for soil consist primarily of residual VOCs and poly aromatic hydrocarbons (PAHs). Results of groundwater sampling indicate that constituents in the soil/fill material have impacted groundwater quality with low concentrations of volatile and semi-volatile compounds. Groundwater in the southwest corner of the Site has been impacted with low concentrations of benzene, 1,2-dichloropropane, toluene, xylene, and ethylbenzene. Analytical test results indicated that groundwater standards have exceeded groundwater standards.

Groundwater in this portion of the Site presumably flows toward the 36-inch diameter sanitary sewer line that runs down the east side of River Road. As stated in Section 2.1 Site Hydrogeology, since the sanitary sewer located along River Road is approximately 15-feet deep, the bottom of the sewer trench is deeper than the top of silty clay unit. Any groundwater migrating from the Site should follow the top of clay and infiltrate into the gravel backfilled sewer trench. Once in the trench, groundwater can enter the sewer through infiltration and could be transmitted to the City's WWTP for treatment.

Deed restrictions enacted by the City, prohibits the installation of potable wells on the property.

4.2 Contemplated Use

As part of the redevelopment project, the property has been identified for industrial/commercial usage. Residential redevelopment will not be permitted. Deed restrictions will require compliance with the SMP. The future use of Site groundwater is prohibited.

4.3 Purpose and Description of Surface Cover System

The purpose of the surface cover system is to eliminate the potential for human contact with fill material and eliminate the potential for contaminated runoff from the property. The cover system consists of existing non-impacted fill soils overlaying the remaining impacted soils located within the River Road ROW. Soil borings completed near the River Road ROW have been logged to report 3 to 6-feet of non-impacted soil overlaying the residually impacted soils. The existing non-impacted soils provide a cover system for any residually impacted materials within the River Road ROW.

4.4 Management of Soil/Fill and Long-Term Maintenance

The purpose of this section is to provide environmental guidelines for management of subsurface soils/fill and the long-term maintenance of the cover system during any future intrusive work which breaches the cover system. The SMP includes the following conditions:

- Any breach of the cover system within the River Road ROW of a width of 33-feet, including for the purposes of construction or utilities work, must be replaced or repaired using an acceptable borrow source free of industrial and/or other potential sources of chemical or petroleum contamination. The repaired area must be covered with clean soil and reseeded or covered with impervious product such as concrete or asphalt to prevent erosion in the future.
- The cover system must be maintained within the River Road ROW since residual impacted soils above NYSDEC Part 375 Unrestricted Use Cleanup Objectives may be present.
- Control surface erosion and run-off from the entire property at all times, including during construction activities. This includes proper maintenance of the fill cover established on the property.
- Site soil that is excavated and is intended to be removed from the property must be managed, characterized, and properly disposed of in accordance with NYSDEC regulations and directives.
- Soil excavated at the Site may be reused as backfill material on-Site provided it contains no visual or olfactory evidence of contamination, and is placed beneath a cover system component of 2 to 3-feet of clean fill from an acceptable source area.
- Any off-Site fill material brought to the Site for filling and grading purposes shall be from an acceptable borrow source free of industrial and/or other potential sources of chemical or petroleum contamination.
- Prior to any construction activities, workers shall be notified of the Site conditions with clear instructions regarding how the work is to proceed. Invasive work performed at the property will be performed in accordance with all applicable local, state, and federal regulations to protect worker health and safety.
- An annual report will contain certification that the institutional controls put in place, pursuant to Operation, Monitoring, and Maintenance Plan (OM&M), are still in place, have not been altered and are still effective; that the remedy and protective cover have been maintained; and that the conditions at the Site are fully protective of public health and the environment. Inspection will be documented and a letter will be submitted to the NYSDEC. The Site designated representative has included the signed IC - EC Certification as presented in Appendix D.

4.5 Excavated and Stockpiled Soil/Fill Disposal

Every effort will be made to keep excavated soils on Site. The proper management of the remaining impacted subsurface soils located within the River Road ROW and other possibly impacted Site soils must be provided. Soil/fill that is excavated as part of redevelopment that cannot be used as fill below the cover system will be characterized prior to transportation off-Site for disposal at a permitted facility. For excavated soil/fill with visual evidence of contamination (i.e., staining or elevated photoionization detector (PID) measurements), one composite sample and a duplicate sample will be collected for each 100 cubic yards of stockpiled soil/fill. For excavated soil/fill that does not exhibit visual evidence of contamination but must be sent for off-Site disposal, one composite sample and a duplicate sample will be collected for each 2,000 cubic yards of stockpiled soil, and a minimum of one sample will be collected for volumes less than 2,000 cubic yards.

The composite sample will be collected from five locations within each stockpile. A duplicate composite sample will also be collected. PID measurements will be recorded for each of the five individual locations. One grab sample will be collected from the individual location with the highest PID measurement. If none of the five individual sample locations exhibit PID readings, one location will be selected at random. The composite sample will be analyzed by a NYSDOH ELAP-certified laboratory for pH (EPA Method 9045C) and Target Compound List (TCL) semi-volatile organic compounds (SVOCs). The grab sample will be analyzed for TCL VOCs.

Additional characterization sampling for off-Site disposal may be required by the disposal facility. To potentially reduce off-Site disposal requirements/costs, the owner or Site developer may also choose to characterize each stockpile individually. If the analytical results indicate that concentrations exceed the standards for Resource Conservation and Recovery Act (RCRA) characteristics, the material will be considered a hazardous waste and must be properly disposed off-Site at a permitted disposal facility within 90 days of excavation. If analytical results indicate that the soil is not a hazardous waste, the material will be properly disposed off-Site at a non-hazardous waste facility. Stockpiled soil cannot be transported on or off-Site until analytical results are received.

4.6 Subgrade Materials

Subgrade material used to backfill excavations or placed to increase Site grades or elevation shall meet the following criteria.

- Subgrade material stockpiled on the surface for re-use must be placed on a liner material or other suitable surface to avoid the commingling of this material with clean topsoil or other surface materials. Stockpiled subgrade material should also be managed to prevent erosion and runoff of precipitation waters which may contact this material.
- Excavated on-Site soil/fill which appears to be visually impacted shall be sampled and analyzed. If backfill materials are suspect, then analytical testing will be required. If soils or soil mixtures are used as backfill materials, they will be sampled for VOCs, SVOCs, pesticides and Polychlorinated Biphenols (PCBs), and metals, and compared to limits listed under Restricted Commercial on Table 3: Imported Backfill Limits.
- Any off-Site fill material brought to the Site for filling and grading purposes shall be from an acceptable borrow source free of industrial and/or other potential sources of chemical or petroleum contamination. A letter will be required from the backfill supplier certifying material is clean from any hazardous and/or solid waste materials.
- Off-Site soils intended for use as Site backfill cannot otherwise be defined as a solid waste in accordance with 6 NYCRR Part 360-2(a).
- If the contractor designates a source as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.
- Virgin soils should be subject to collection of one representative composite sample per source. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals. The soil will be acceptable for use as backfill provided that all parameters meet the Imported Backfill Limits.
- Non-virgin soils will be tested via collection of one composite sample per 500 cubic yards of material from each source area. If more than 1,000 cubic yards of soil are borrowed from a given off-Site non-virgin soil source area and both samples of the first 1,000 cubic yards meet Table 3 Limits, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, provided all earlier samples met the imported backfill limits.

4.7 Site Usage

The Site is presently used by Metzger Removal, Inc. as a C&D crushing/recycling operation. Concrete, brick and other materials are hauled to the Site from demolition sites in the surrounding area, and stockpiled for the crushing operation. After crushing, conveyors collect the crushed material and stage in stockpiles. No excavation took place at the Site during the period between 2012 and 2021.

5. Conclusions

Analytical testing from the 2021 groundwater monitoring detected the following VOCs in groundwater sampled from monitoring wells MW-1 and MW-2: benzene (MW-2), ethylbenzene (MW-1 and MW-2), cyclohexane (MW-1 and MW-2), methylcyclohexane (MW-1 and MW-2), isopropylbenzene (MW-1 and MW-2), toluene (MW-2), and total xylenes (MW-2) at concentrations that were equal to or exceeded the groundwater standard.

5.1 Monitoring Well MW-1 Results

The concentrations of ethylbenzene at monitoring well MW-1 have fluctuated over the reported seven reporting periods. In 2007, the concentration of ethylbenzene was detected at an estimated 2 µg/L concentration, which is below the groundwater standard. Test results from the most recent 2021 groundwater monitoring detected the concentration of ethylbenzene at 13 µg/L, which represents an increase from the previous sampling event.

Concentrations of isopropylbenzene at monitoring well MW-1 have similarly fluctuated over the reported seven sampling events. Isopropylbenzene was not detected at monitoring well MW-1 in 2007. Test results from the 2012 sampling event detected concentrations of isopropylbenzene at 33 µg/L. Test results from the most recent 2021 groundwater monitoring detected the concentration of isopropylbenzene at 24 µg/L.

5.2 Monitoring Well MW-2 Results

Concentrations of benzene at monitoring well MW-2 have fluctuated over the eight reporting periods of 2007, 2012, 2015, 2016, 2017, 2019, 2020, and 2021. The following concentrations of benzene and corresponding percent annual increases and decreases were detected in groundwater:

2007	140 µg/L	NA
2012	560 µg/L	300% increase
2015	151 µg/L	73% decrease
2016	280 µg/L	85% increase
2017	207 µg/L	26% decrease
2019	269 µg/L	30% increase
2020	192 µg/L	29% decrease
2021	155 µg/L	19% decrease

Concentrations of ethylbenzene at monitoring well MW-2 have fluctuated over the eight reporting periods of 2007, 2012, 2015, 2016, 2017, 2019, 2020, and 2021. The following concentrations of ethylbenzene and corresponding annual percent increases and decreases were detected in groundwater:

2007	460 µg/L	NA
2012	1,500 µg/L	226% increase
2015	878 µg/L	41% decrease
2016	2,030 µg/L	131% increase
2017	2,050 µg/L	1% increase
2019	2,000 µg/L	2% decrease
2020	1,410 µg/L	30% decrease
2021	2,250 µg/L	37% increase

Concentrations of isopropylbenzene at monitoring well MW-2 have fluctuated over the eight reporting periods of 2007, 2012, 2015, 2016, 2017, 2019, 2020, and 2020. The following concentrations of isopropylbenzene and corresponding annual percent increases and decreases were detected in groundwater:

2007	ND	NA
2012	220 µg/L	-
2015	115 µg/L	48% decrease
2016	277 µg/L	141% increase
2017	247 µg/L	11% decrease
2019	237 µg/L	4% decrease
2020	200 µg/L	16% decrease
2021	370 µg/L	85% increase

Concentrations of toluene at monitoring well MW-2 have fluctuated over the eight reporting periods of 2007, 2012, 2015, 2016, 2017, 2019, 2020, and 2021. The following concentrations of toluene and corresponding annual percent increases and decreases were detected in groundwater:

2007	70 µg/L	NA
2012	ND	100% decrease
2015	19.1 µg/L	-
2016	39.4 µg/L	106% increase
2017	13.4 µg/L	66% decrease
2019	42.7 µg/L	218% increase
2020	48.3 µg/L	13% increase
2021	31.5 µg/L	35% decrease

Concentrations of total xylenes at monitoring well MW-2 have fluctuated over the eight reporting periods of 2007, 2012, 2015, 2016, 2017, 2019, 2020, and 2021. The following concentrations of total xylenes and corresponding annual percent increases and decreases were detected in groundwater:

2007	520 µg/L	NA
2012	840 µg/L	62% increase
2015	424 µg/L	50% decrease
2016	620 µg/L	46% increase
2017	99 µg/L	84% decrease
2018	655 µg/L	561% increase
2019	557 µg/L	15% decrease
2021	330 µg/L	41% decrease

In general, detected VOCs concentrations exhibit a stable/decreasing trend of with the exception of total ethylbenzene.

5.3 Future Abatement

An Interim Remedial Measure (IRM) was completed in November 2007 that included the excavation and disposal of 1,300 tons of impacted and staged soils. The excavation followed the delineation of impacted soils as defined in the site investigation report. IRM excavation limits at the southwest corner of the impacted area extended to the approximate bounds of the River Road ROW. The excavation of impacted material near the ROW was limited due to the close proximity of utilities and NYSDOT Route 265 (River Road) pavement. Excavation was not scaled back to a standard angle of repose for the reason of removing as much impacted soil as possible. Depth of excavation limits was to the top of clay ranging in depth from 10.5 to 11.5-feet. Confirmatory soil samples were collected prior to backfill.

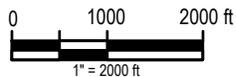
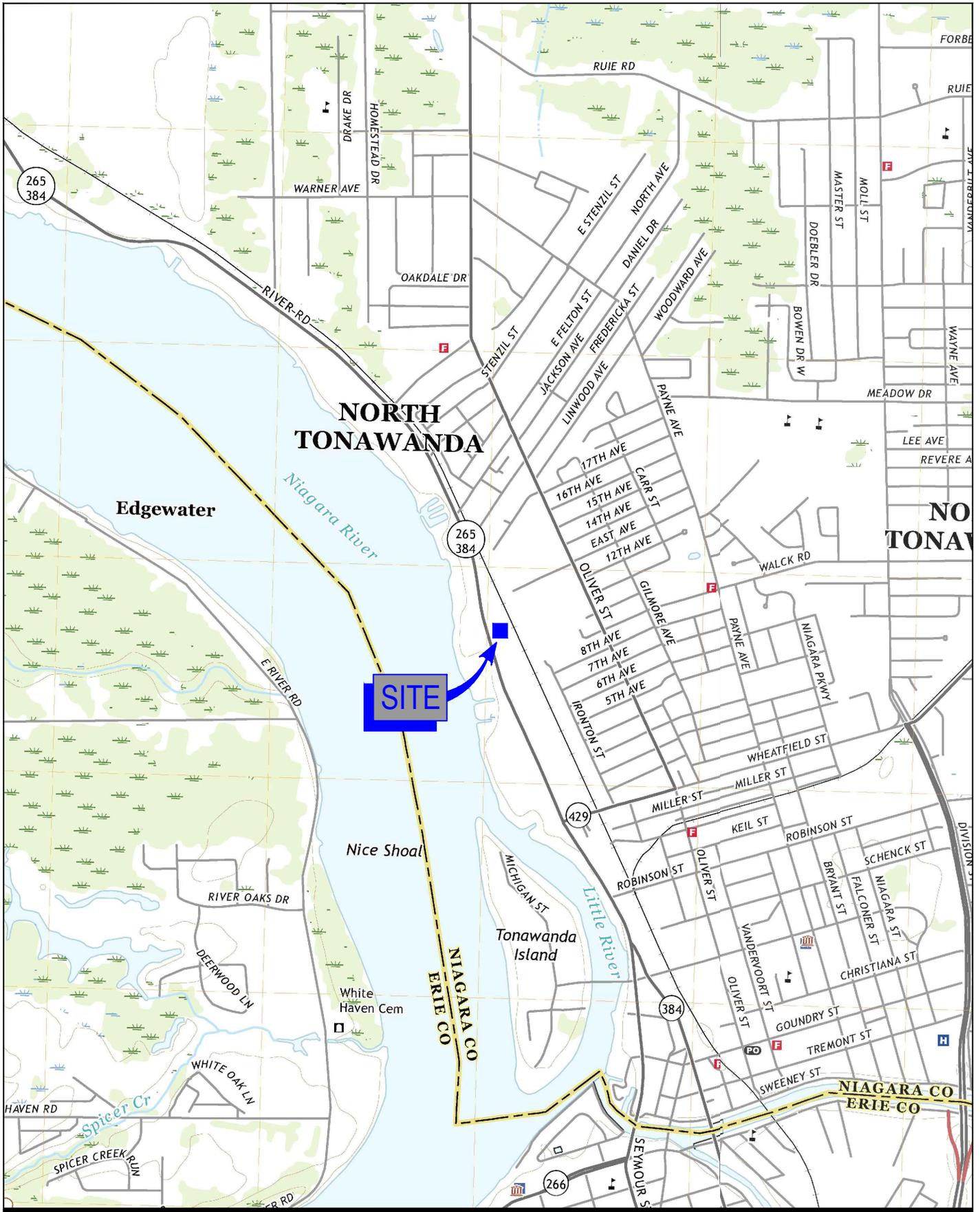
During the IRM, it was evident that impacted soils remained at the final location of the southwest excavated wall. Impacted soils were excavated as far as possible to the River Road ROW. No further excavation could be advanced without putting in jeopardy utilities and the River Road pavement. The City remediated the property to the River Road ROW and no further remediation or removal of impacted soils could take place.

Wells were installed knowing that groundwater would be impacted and that groundwater test results could be above groundwater standards as reported in previous Periodic Review Reports. Groundwater Monitoring and Sampling Annual Reporting detected a number of VOCs in groundwater equal to or exceeding the groundwater standard. As reported, local groundwater movement at the Site is toward the Niagara River and the City's combined interceptor River Road sewer. This sewer should act as an interceptor of groundwater ultimately discharging to the City's WWTP and current carbon treatment.

The Site was remediated to the extent practically possible. The remaining impacted soils appear to be located at and under the River Road ROW, which is not City property. The impacted groundwater is the result of the presence of impacted soils located at the River Road ROW.

No future abatement is proposed at this time since impacted soils are not located on formerly City-owned property.

Figures



Coordinate System:
NY83-WF

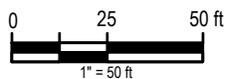
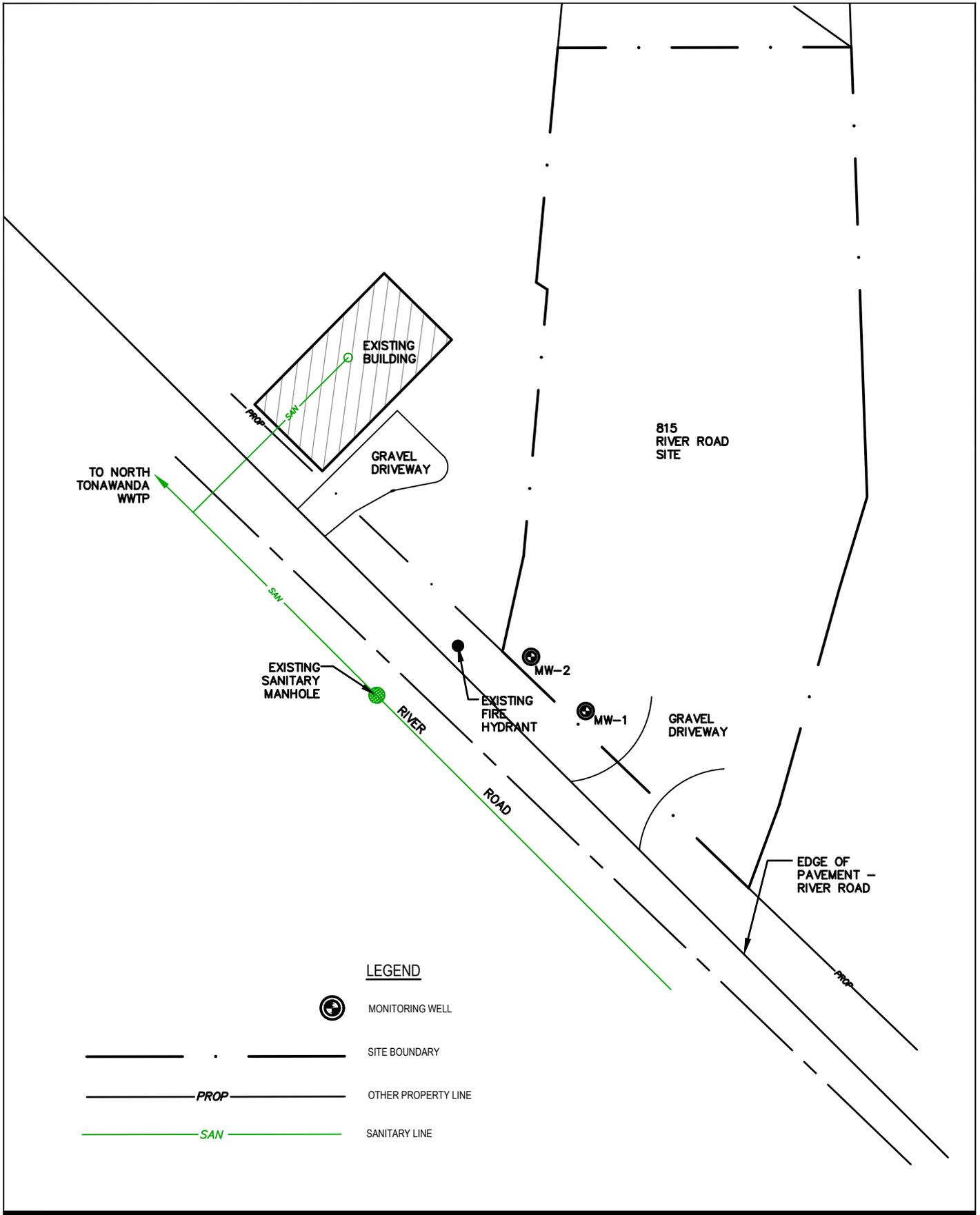


815 RIVER ROAD SITE
NORTH TONAWANDA, NEW YORK

Project No. 11230275
Date August 2021

SITE LOCATION

FIGURE 1



Coordinate System:
NY83-WF

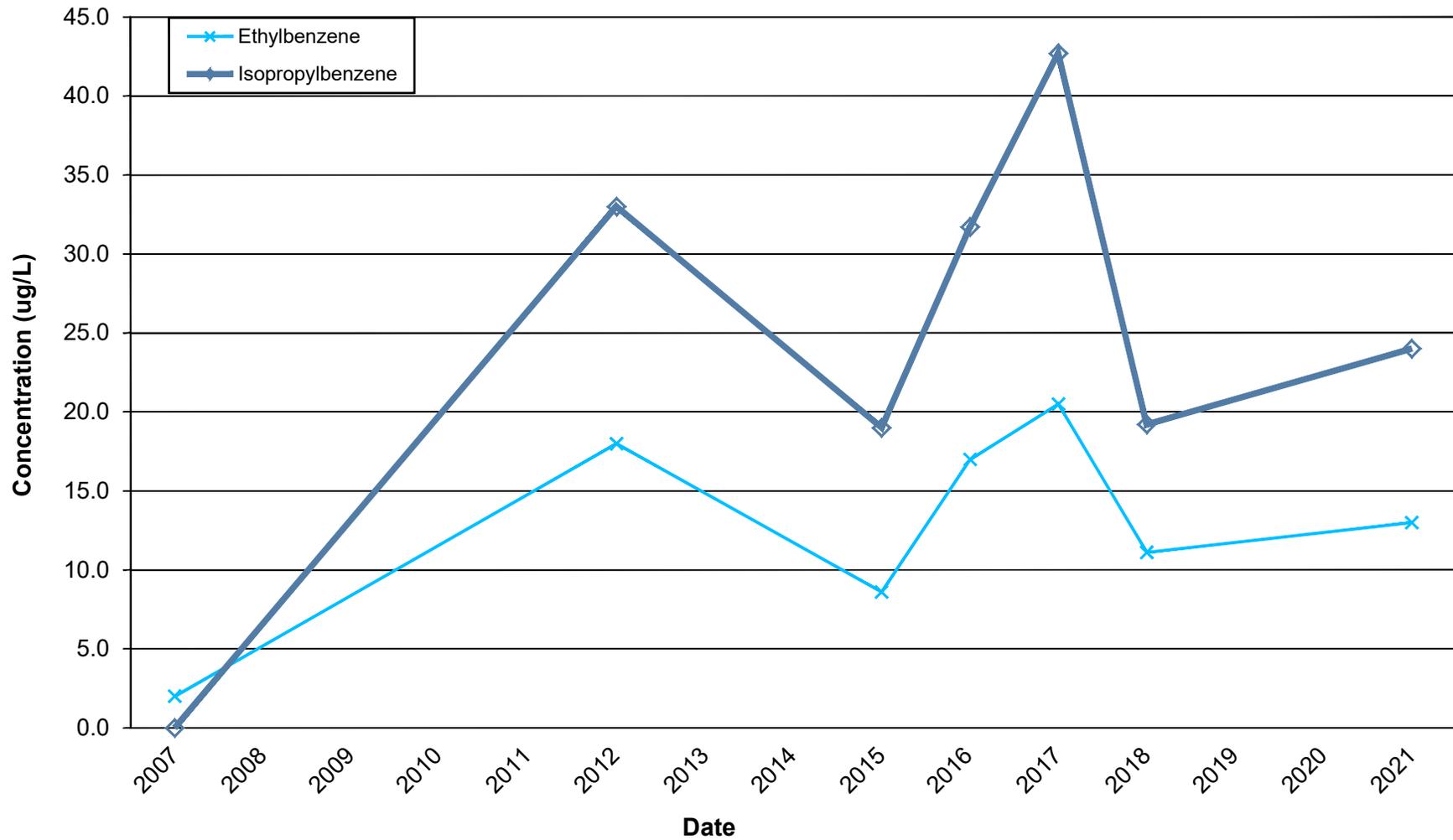


815 RIVER ROAD SITE
NORTH TONAWANDA, NEW YORK

Project No. 11230275
Date August 2021

SITE PLAN

FIGURE 2

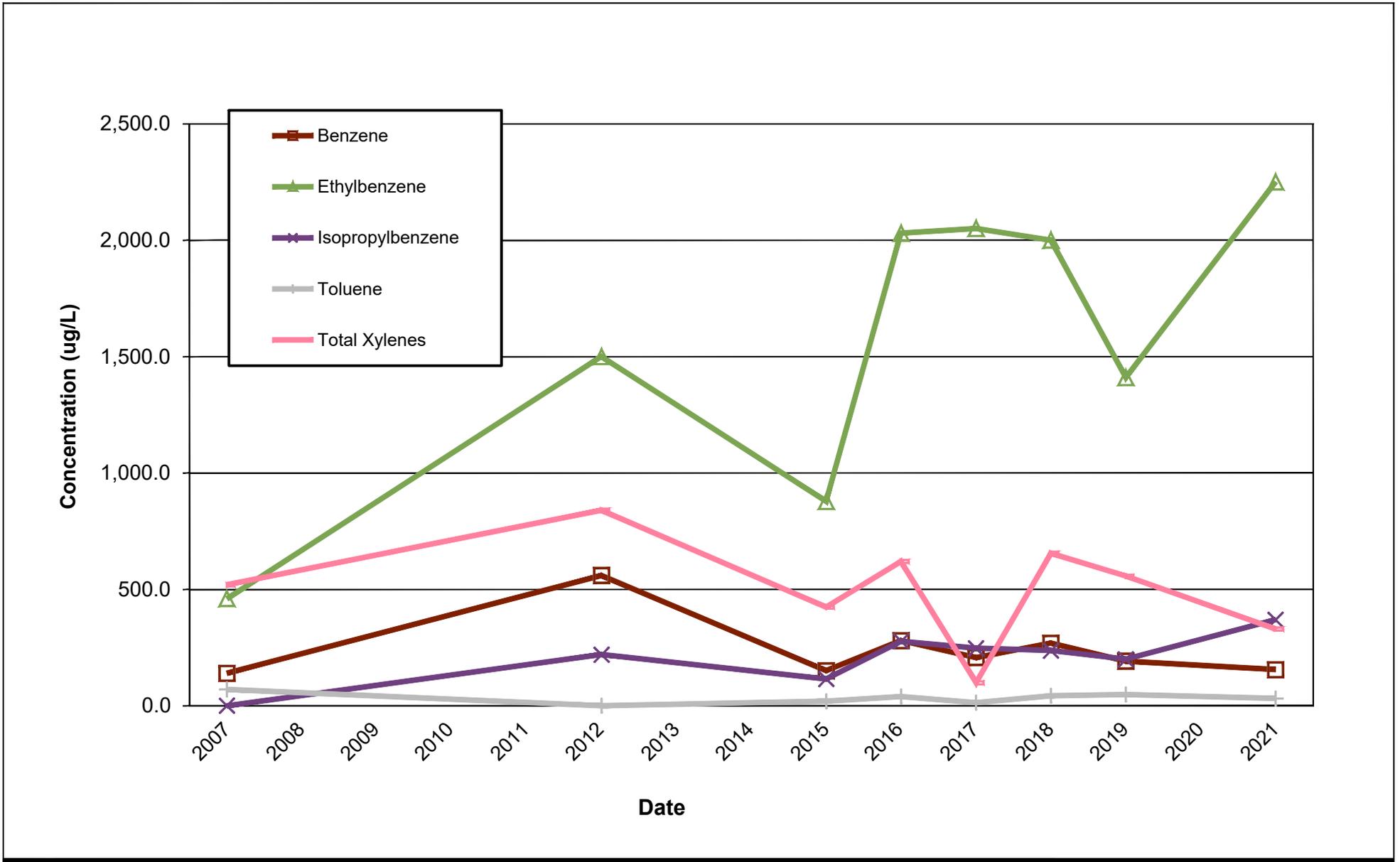


815 RIVER ROAD SITE
NORTH TONAWANDA, NEW YORK

Project No. 11230275
Date August 2021

GROUNDWATER VOC CONCENTRATIONS
IN MW-1 vs TIME

FIGURE 3



815 RIVER ROAD SITE
NORTH TONAWANDA, NEW YORK

Project No. 11230275
Date August 2021

GROUNDWATER VOC CONCENTRATIONS
IN MW-2 vs TIME

FIGURE 4

Tables

Table 1

**Monitoring Well MW-1
Volatile Organic Analytical Test Results
815 River Road Site**

Volatile Compounds	NYSDEC TOGS 1.1.1 Water Quality Standards ¹	Units	Monitoring Well MW-1								
			07/16/07	07/25/12	10/20/15	10/21/16	10/25/17	03/21/19	01/28/20	07/23/21	
1,1,1-Trichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,1,2,2-Tetrachloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	-
1,1,2-Trichloroethane	1	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,1-Dichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,1-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,2,3-Trichlorobenzene	5	µg/L	-	ND	0.41J	ND	ND	ND	ND	NA	ND
1,2,4-Trichlorobenzene	5	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dibromo-3-Chloropropane DBCP	0.04	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dibromoethane (EDB)	NE	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dichloropropane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
1,3-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
1,4-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
2-Hexanone	50	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Acetone	50	µg/L	ND	ND	88.8	ND	ND	ND	ND	NA	ND
Benzene	1	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Bromoform	50	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Bromomethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Bromodichloromethane	50	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Bromochloromethane	5	µg/L	-	ND	ND	ND	ND	ND	ND	NA	ND
Carbon disulfide	60	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Carbon tetrachloride	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Chlorobenzene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Chloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Chloroform	7	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Chloromethane	NE	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
cis-1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
cis-1,3-Dichloropropene	0.40	µg/L	ND	ND	ND	ND	ND	ND	ND	NA	ND
Cyclohexane	NE	µg/L	ND	82	ND	8.64	29.10	39.10	NA	84.0	
Dibromochloromethane	50	µg/L	ND	ND	-	-	-	-	NA	ND	
Chlorodibromomethane	NE	µg/L	-	ND	ND	ND	ND	ND	NA	-	
Dichlorodifluoromethane	5	µg/L	-	ND	ND	ND	ND	ND	NA	ND	
Ethylbenzene	5	µg/L	2J	18	8.6	17.0	20.5	11.1	NA	13.0	
Isopropylbenzene	5	µg/L	ND	33	19.0	31.7	42.7	19.2	NA	24.0	
Methyl acetate	NE	µg/L	-	ND	ND	ND	ND	ND	NA	ND	
Methyl Ethyl Ketone (MEK)	50	µg/L	-	ND	ND	ND	ND	ND	NA	ND	
Methylcyclohexane	NE	µg/L	ND	15	ND	ND	20.5	ND	NA	17.0	
Methylene chloride	5	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
4-Methyl 2-Pentanone	NE	µg/L	-	-	ND	ND	ND	ND	NA	ND	
Methyl-t-Butyl Ether (MTBE)	10	µg/L	-	ND	-	-	-	-	NA	ND	
Methyl tert-butyl ester	NE	µg/L	-	ND	ND	ND	ND	ND	NA	-	
m,p-Xylene	5	µg/L	4J	-	-	-	-	-	NA	-	
o-Xylene	5	µg/L	ND	-	-	-	-	-	NA	-	
Styrene	5	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
Tetrachloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
Toluene	5	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
Total Xylenes	5	µg/L	4J	ND	ND	ND	ND	4.9	NA	ND	
trans-1, 2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
trans-1,3-Dichloropropene	0.4	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
Trichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
Trichlorofluoromethane	5	µg/L	-	ND	ND	ND	ND	ND	NA	ND	
Vinyl Chloride	2	µg/L	ND	ND	ND	ND	ND	ND	NA	ND	
Total VOCs		µg/L	6.0	148.0	28.0	57.3	112.8	74.3	NA	138.0	
Total VOCs		mg/L	0.006	0.148	0.028	0.057	0.113	0.074	NA	0.138	

Notes:

1. New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1:

Ambient Water Quality Standards and Guidance Values (µg/L)

Bolded concentrations indicated the analyte was detected. Bolded and shaded concentrations indicate equal to or exceedance of TOGS 1.1.1 criteria.

NE = NYSDEC TOGS 1.1.1 water quality standard not established.

ND = The analyte was analyzed for but not detected. The associated value is the analyte quantitation limit.

NA = Not sampled due to well in damaged condition.

J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

- = The analyte was not sampled for.

Synonyms: Chlorodibromomethane = Dichlorobromoethane

Synonyms: 4-Methyl 2-Pentanone = Methyl Isobutyl Ketone

Synonyms: Methyl Ethyl Ketone (MEK) = 2-Butanone

Acetone not included in Total VOCs at direction of DEC.

Table 2
Monitoring Well MW-2
Volatile Organic Analytical Test Results
815 River Road Site

Volatile Compounds	NYSDEC TOGS 1.1.1 Water Quality Standards ¹	Units	07/16/07	07/25/12	10/20/15	10/21/16	10/25/17	03/21/19	01/28/20	07/23/21
1,1,1-Trichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlo-1,2,2-trifluoroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	-
1,1,2-Trichloroethane	1	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5	µg/L	-	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5	µg/L	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane DBCP	0.04	µg/L	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	NE	µg/L	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	5	µg/L	40J	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	50	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50	µg/L	ND	ND	188J	ND	ND	ND	ND	ND
Benzene	1	µg/L	140	560	151	280J6	207	269	192	155.0
Bromoform	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	µg/L	-	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	60	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	NE	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.40	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	NE	µg/L	ND	210	71.2	169	111J6	336	283	280.0
Dibromochloromethane	50	µg/L	ND	ND	-	-	-	-	-	ND
Chlorodibromomethane	NE	µg/L	-	ND	ND	ND	ND	ND	ND	-
Dichlorodifluoromethane	5	µg/L	-	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	µg/L	460	1,500	878V	2030	2050	2000	1410	2250.0
Isopropylbenzene	5	µg/L	ND	220	115	277J6	247	237	200	370.0
Methyl acetate	NE	µg/L	-	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (MEK)	50	µg/L	-	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	NE	µg/L	ND	15	19.8	58.9	43.3J6	ND	103.0	120.0
Methylene chloride	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl 2-Pentanone	NE	µg/L	-	-	ND	ND	ND	ND	ND	ND
Methyl-t-Butyl Ether (MTBE)	10	µg/L	-	ND	-	-	-	-	ND	ND
Methyl tert-butyl esther	NE	µg/L	-	ND	ND	ND	ND	ND	ND	-
m,p-Xylene	5	µg/L	480	-	-	-	-	-	-	-
o-Xylene	5	µg/L	40J	-	-	-	-	-	-	-
Styrene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	µg/L	70J	ND	19.1J	39.4	13.4	42.7	48.3	31.5
Total Xylenes	5	µg/L	-	840	424	620	99	655	557	330.0
trans-1, 2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.4	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	5	µg/L	-	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs		µg/L	1,230.0	3,345.0	1,866.1	3,474.3	2,771.1	3,539.7	2,793.3	3,536.5
Total VOCs		mg/L	1.230	3.345	1.866	3.474	2.771	3.540	2.793	3.537

Notes

- New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values (µg/L)
 Bolded concentrations indicated the analyte was detected. Bolded and shaded concentrations indicate equal to or exceedance of TOGS 1.1.1 criteria.
 NE = NYSDEC TOGS 1.1.1 water quality standard not established.
 ND = The analyte was analyzed for but not detected. The associated value is the analyte quantitation limit.
 J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low.
 V = The sample concentration is too high to evaluate accurate spike recoveries.
 - = The analyte was not sampled for.
 Synonyms: Chlorodibromomethane = Dichlorobromomethane
 Synonyms: 4-Methyl 2-Pentanone = Methyl Isobutyl Ketone
 Synonyms: Methyl Ethyl Ketone (MEK) = 2-Butanone

Appendices

Appendix A

Groundwater Sampling Field Logs

Monitoring Well Record for Low-Flow Purging
(Form SP-09)

MS/MSD

Project Data:

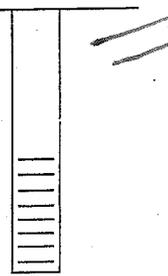
Project Name: 815 RIVER RD ANNUAL
Ref. No.: 11230275-01

Date: 7/23/2021
Personnel: S GARDNER

Monitoring Well Data:

Well No.: MW-1
Vapour PID (ppm): _____
Measurement Point: _____
Constructed Well Depth (m/ft): _____
Measured Well Depth (m/ft): 14.88
Depth of Sediment (m/ft): _____

Saturated Screen Length (m/ft): _____
Depth to Pump Intake (m/ft)⁽¹⁾: _____
Well Diameter, D (cm/in): _____
Well Screen Volume, V_s (L)⁽²⁾: _____
Initial Depth to Water (m/ft): 5.98



Time	Pumping Rate (mL/min)	Depth to Water (m/ft)	Drawdown from Initial Water Level ⁽³⁾ (m/ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)	Volume Purged, V _p (L)	No. of Well Screen Volumes Purged ⁽⁴⁾
Precision Required ⁽⁵⁾ :				±3 %	±0.005 or 0.01 ⁽⁶⁾	±10 %	±10 %	±0.1 Units	±10 mV		
0838	80	6.52	0.54	17.3	2.63	2.36	2.32	7.03	-80.9		
0843	80	6.71	0.73	16.7	2.62	2.01	1.67	7.08	-92.1		
0848	68	6.81	0.83	16.9	2.61	0.96	1.56	7.13	-124.0		
0853	68	6.80	0.82	17.2	2.60	0.90	1.44	7.17	-153.1		
0858	78	6.84	0.86	17.3	2.58	1.43	1.45	7.20	-162.7		
0903		6.88	0.90	17.4	2.57	1.49	1.43	7.21	-168.2		

Sample ID: WG-11230275-072321-SG-00B Sample Time: 0910

Notes: CLEAR, COLORLESS, SLIGHT CHEMICAL LIKE ODDR

- (1) The pump intake will be placed at the well screen mid-point or at a minimum of 0.6 m (2 ft) above any sediment accumulated at the well bottom.
- (2) The well screen volume will be based on a 1.52 metres (5-foot) screen length (L). For metric units, $V_s = \pi * (r^2) * L$ in mL, where r (r=D/2) and L are in cm. For Imperial units, $V_s = \pi * (r^2) * L * (2.54)^3$, where r and L are in inches
- (3) The drawdown from the initial water level should not exceed 0.1 m (0.3 ft). The pumping rate should not exceed 500 mL/min.
- (4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stabilization criteria and appear to be stabilizing), No. of Well Screen Volumes Purged= V_p/V_s.
- (5) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

START PURGE @ 0832

Shaun Gardner

Eurofins TestAmerica, Buffalo

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

Chain of Custody Record

Client Information		Sampler: S GARDNER	Lab PM: Heckler, Denise D	Carrier Tracking No(s):	COC No: 480-163240-35872.1							
Client Contact: Linda Waters		Phone:	E-Mail: Denise.Heckler@Eurofinset.com	State of Origin: NEW YORK	Page: Page 1 of 1							
Company: GHD Services Inc.		PWSID:	Analysis Requested									
Address: 2055 Niagara Falls Blvd., Suite 3		Due Date Requested:	Total Number of Containers:									
City: Niagara Falls		TAT Requested (days): 5 DAYS										
State, Zip: NY, 14304		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No										
Phone:		PO #: Purchase Order Requested										
Email: Linda.Waters@ghd.com		WO #: 11230275										
Project Name: 11230275, River Road		Project #: 48024079										
Site: B15 RIVER RD NT, NY		SSOW#: 11230275-2021	Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:									
Sample Identification		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 - VOCs	Special Instructions/Note:
							Preservation Code:		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	A	
WG-11230275-072321-S6-001		7/23/21				1025	G	Water	<input checked="" type="checkbox"/>			3
WB-11230275-072321-S6-002		7/23/21				1025	G	Water	<input checked="" type="checkbox"/>			3
WB-11230275-072321-S6-003		7/23/21				0910	G	Water	<input checked="" type="checkbox"/>			9 MS/MSD
TB-11230275-072321-S6		7/23/21						Water	<input checked="" type="checkbox"/>			2
								Water				
								Water				
								Water				
					Water							
					Water							
					Water							
					Water							
Possible Hazard Identification		<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:										
Empty Kit Relinquished by:		Date:	Time:	Method of Shipment: HAND DELIVER								
Relinquished by: <i>Shawn Gardner</i>		Date/Time: 7/23/2021 1055	Company:	Received by:		Date/Time:	Company:					
Relinquished by:		Date/Time:	Company:	Received by:		Date/Time:	Company:					
Relinquished by:		Date/Time:	Company:	Received by:		Date/Time:	Company:					
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:								

Appendix B

Analytical Test Results

ANALYTICAL REPORT

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

Laboratory Job ID: 480-187600-1
Client Project/Site: 11230275, River Road

For:
GHD Services Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Linda Waters



Authorized for release by:
7/29/2021 7:49:09 AM

Denise Heckler, Project Manager II
(330)966-9477
Denise.Heckler@Eurofinset.com

LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Job ID: 480-187600-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative 480-187600-1

Comments

No additional comments.

Receipt

The samples were received on 7/23/2021 10:55 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.1° C.

GC/MS VOA

Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: WG-11230275-072321-SG-001 (480-187600-1) and WG-11230275-072321-SG-002 (480-187600-2). Elevated reporting limits (RLs) are provided.

Method 8260C: The continuing calibration verification (CCV) associated with batch 480-590508 recovered above the upper control limit for Tetrachloroethene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: WG-11230275-072321-SG-003 (480-187600-3).

Method 8260C: The following volatiles samples were diluted due to foaming at the time of purging during the original sample analysis: WG-11230275-072321-SG-003 (480-187600-3), WG-11230275-072321-SG-003 (480-187600-3[MS]) and WG-11230275-072321-SG-003 (480-187600-3[MSD]). Elevated reporting limits (RLs) are provided.

Method 8260C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 480-590508 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. The associated samples are: WG-11230275-072321-SG-003 (480-187600-3[MS]) and WG-11230275-072321-SG-003 (480-187600-3[MSD]).

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

Detection Summary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: WG-11230275-072321-SG-001

Lab Sample ID: 480-187600-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	140		40	16	ug/L	40		8260C	Total/NA
Cyclohexane	240		40	7.2	ug/L	40		8260C	Total/NA
Ethylbenzene	2100		40	30	ug/L	40		8260C	Total/NA
Isopropylbenzene	350		40	32	ug/L	40		8260C	Total/NA
Methylcyclohexane	110		40	6.4	ug/L	40		8260C	Total/NA
Toluene	29	J	40	20	ug/L	40		8260C	Total/NA
Xylenes, Total	310		80	26	ug/L	40		8260C	Total/NA

Client Sample ID: WG-11230275-072321-SG-002

Lab Sample ID: 480-187600-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	170		40	16	ug/L	40		8260C	Total/NA
Cyclohexane	320		40	7.2	ug/L	40		8260C	Total/NA
Ethylbenzene	2400		40	30	ug/L	40		8260C	Total/NA
Isopropylbenzene	390		40	32	ug/L	40		8260C	Total/NA
Methylcyclohexane	130		40	6.4	ug/L	40		8260C	Total/NA
Toluene	34	J	40	20	ug/L	40		8260C	Total/NA
Xylenes, Total	350		80	26	ug/L	40		8260C	Total/NA

Client Sample ID: WG-11230275-072321-SG-003

Lab Sample ID: 480-187600-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyclohexane	84		10	1.8	ug/L	10		8260C	Total/NA
Ethylbenzene	13		10	7.4	ug/L	10		8260C	Total/NA
Isopropylbenzene	24		10	7.9	ug/L	10		8260C	Total/NA
Methylcyclohexane	17		10	1.6	ug/L	10		8260C	Total/NA

Client Sample ID: TB-11230275-072321-SG

Lab Sample ID: 480-187600-4

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Buffalo

Client Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: WG-11230275-072321-SG-001

Lab Sample ID: 480-187600-1

Date Collected: 07/23/21 10:25

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	33	U	40	33	ug/L			07/26/21 17:49	40
1,1,2,2-Tetrachloroethane	8.4	U	40	8.4	ug/L			07/26/21 17:49	40
1,1,2-Trichloroethane	9.2	U	40	9.2	ug/L			07/26/21 17:49	40
1,1,2-Trichloro-1,2,2-trifluoroethane	12	U	40	12	ug/L			07/26/21 17:49	40
1,1-Dichloroethane	15	U	40	15	ug/L			07/26/21 17:49	40
1,1-Dichloroethene	12	U	40	12	ug/L			07/26/21 17:49	40
1,2,4-Trichlorobenzene	16	U	40	16	ug/L			07/26/21 17:49	40
1,2-Dibromo-3-Chloropropane	16	U	40	16	ug/L			07/26/21 17:49	40
1,2-Dichlorobenzene	32	U	40	32	ug/L			07/26/21 17:49	40
1,2,3-Trichlorobenzene	16	U	40	16	ug/L			07/26/21 17:49	40
1,2-Dichloroethane	8.4	U	40	8.4	ug/L			07/26/21 17:49	40
1,2-Dichloropropane	29	U	40	29	ug/L			07/26/21 17:49	40
1,3-Dichlorobenzene	31	U	40	31	ug/L			07/26/21 17:49	40
1,4-Dichlorobenzene	34	U	40	34	ug/L			07/26/21 17:49	40
2-Butanone (MEK)	53	U	400	53	ug/L			07/26/21 17:49	40
2-Hexanone	50	U	200	50	ug/L			07/26/21 17:49	40
4-Methyl-2-pentanone (MIBK)	84	U	200	84	ug/L			07/26/21 17:49	40
Acetone	120	U	400	120	ug/L			07/26/21 17:49	40
Benzene	140		40	16	ug/L			07/26/21 17:49	40
Bromodichloromethane	16	U	40	16	ug/L			07/26/21 17:49	40
Bromoform	10	U	40	10	ug/L			07/26/21 17:49	40
Bromomethane	28	U	40	28	ug/L			07/26/21 17:49	40
Carbon disulfide	7.6	U	40	7.6	ug/L			07/26/21 17:49	40
Carbon tetrachloride	11	U	40	11	ug/L			07/26/21 17:49	40
Chlorobenzene	30	U	40	30	ug/L			07/26/21 17:49	40
Dibromochloromethane	13	U	40	13	ug/L			07/26/21 17:49	40
Chloroethane	13	U	40	13	ug/L			07/26/21 17:49	40
Chloroform	14	U	40	14	ug/L			07/26/21 17:49	40
Chloromethane	14	U	40	14	ug/L			07/26/21 17:49	40
cis-1,2-Dichloroethene	32	U	40	32	ug/L			07/26/21 17:49	40
cis-1,3-Dichloropropene	14	U	40	14	ug/L			07/26/21 17:49	40
Cyclohexane	240		40	7.2	ug/L			07/26/21 17:49	40
Dichlorodifluoromethane	27	U	40	27	ug/L			07/26/21 17:49	40
Ethylbenzene	2100		40	30	ug/L			07/26/21 17:49	40
1,2-Dibromoethane	29	U	40	29	ug/L			07/26/21 17:49	40
Isopropylbenzene	350		40	32	ug/L			07/26/21 17:49	40
Methyl acetate	52	U	100	52	ug/L			07/26/21 17:49	40
Methyl tert-butyl ether	6.4	U	40	6.4	ug/L			07/26/21 17:49	40
Methylcyclohexane	110		40	6.4	ug/L			07/26/21 17:49	40
Methylene Chloride	18	U	40	18	ug/L			07/26/21 17:49	40
Styrene	29	U	40	29	ug/L			07/26/21 17:49	40
Tetrachloroethene	14	U	40	14	ug/L			07/26/21 17:49	40
Toluene	29 J		40	20	ug/L			07/26/21 17:49	40
trans-1,2-Dichloroethene	36	U	40	36	ug/L			07/26/21 17:49	40
trans-1,3-Dichloropropene	15	U	40	15	ug/L			07/26/21 17:49	40
Trichloroethene	18	U	40	18	ug/L			07/26/21 17:49	40
Trichlorofluoromethane	35	U	40	35	ug/L			07/26/21 17:49	40
Vinyl chloride	36	U	40	36	ug/L			07/26/21 17:49	40
Xylenes, Total	310		80	26	ug/L			07/26/21 17:49	40

Euofins TestAmerica, Buffalo

Client Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: WG-11230275-072321-SG-001

Lab Sample ID: 480-187600-1

Date Collected: 07/23/21 10:25

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobromomethane	35	U	40	35	ug/L			07/26/21 17:49	40
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	94		80 - 120					07/26/21 17:49	40
1,2-Dichloroethane-d4 (Surr)	101		77 - 120					07/26/21 17:49	40
4-Bromofluorobenzene (Surr)	107		73 - 120					07/26/21 17:49	40
Dibromofluoromethane (Surr)	109		75 - 123					07/26/21 17:49	40

Client Sample ID: WG-11230275-072321-SG-002

Lab Sample ID: 480-187600-2

Date Collected: 07/23/21 10:25

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	33	U	40	33	ug/L			07/26/21 18:12	40
1,1,1,2-Tetrachloroethane	8.4	U	40	8.4	ug/L			07/26/21 18:12	40
1,1,2-Trichloroethane	9.2	U	40	9.2	ug/L			07/26/21 18:12	40
1,1,2-Trichloro-1,2,2-trifluoroethane	12	U	40	12	ug/L			07/26/21 18:12	40
1,1-Dichloroethane	15	U	40	15	ug/L			07/26/21 18:12	40
1,1-Dichloroethene	12	U	40	12	ug/L			07/26/21 18:12	40
1,2,4-Trichlorobenzene	16	U	40	16	ug/L			07/26/21 18:12	40
1,2-Dibromo-3-Chloropropane	16	U	40	16	ug/L			07/26/21 18:12	40
1,2-Dichlorobenzene	32	U	40	32	ug/L			07/26/21 18:12	40
1,2,3-Trichlorobenzene	16	U	40	16	ug/L			07/26/21 18:12	40
1,2-Dichloroethane	8.4	U	40	8.4	ug/L			07/26/21 18:12	40
1,2-Dichloropropane	29	U	40	29	ug/L			07/26/21 18:12	40
1,3-Dichlorobenzene	31	U	40	31	ug/L			07/26/21 18:12	40
1,4-Dichlorobenzene	34	U	40	34	ug/L			07/26/21 18:12	40
2-Butanone (MEK)	53	U	400	53	ug/L			07/26/21 18:12	40
2-Hexanone	50	U	200	50	ug/L			07/26/21 18:12	40
4-Methyl-2-pentanone (MIBK)	84	U	200	84	ug/L			07/26/21 18:12	40
Acetone	120	U	400	120	ug/L			07/26/21 18:12	40
Benzene	170		40	16	ug/L			07/26/21 18:12	40
Bromodichloromethane	16	U	40	16	ug/L			07/26/21 18:12	40
Bromoform	10	U	40	10	ug/L			07/26/21 18:12	40
Bromomethane	28	U	40	28	ug/L			07/26/21 18:12	40
Carbon disulfide	7.6	U	40	7.6	ug/L			07/26/21 18:12	40
Carbon tetrachloride	11	U	40	11	ug/L			07/26/21 18:12	40
Chlorobenzene	30	U	40	30	ug/L			07/26/21 18:12	40
Dibromochloromethane	13	U	40	13	ug/L			07/26/21 18:12	40
Chloroethane	13	U	40	13	ug/L			07/26/21 18:12	40
Chloroform	14	U	40	14	ug/L			07/26/21 18:12	40
Chloromethane	14	U	40	14	ug/L			07/26/21 18:12	40
cis-1,2-Dichloroethene	32	U	40	32	ug/L			07/26/21 18:12	40
cis-1,3-Dichloropropene	14	U	40	14	ug/L			07/26/21 18:12	40
Cyclohexane	320		40	7.2	ug/L			07/26/21 18:12	40
Dichlorodifluoromethane	27	U	40	27	ug/L			07/26/21 18:12	40
Ethylbenzene	2400		40	30	ug/L			07/26/21 18:12	40
1,2-Dibromoethane	29	U	40	29	ug/L			07/26/21 18:12	40
Isopropylbenzene	390		40	32	ug/L			07/26/21 18:12	40

Eurofins TestAmerica, Buffalo

Client Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: WG-11230275-072321-SG-002

Lab Sample ID: 480-187600-2

Date Collected: 07/23/21 10:25

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl acetate	52	U	100	52	ug/L			07/26/21 18:12	40
Methyl tert-butyl ether	6.4	U	40	6.4	ug/L			07/26/21 18:12	40
Methylcyclohexane	130		40	6.4	ug/L			07/26/21 18:12	40
Methylene Chloride	18	U	40	18	ug/L			07/26/21 18:12	40
Styrene	29	U	40	29	ug/L			07/26/21 18:12	40
Tetrachloroethene	14	U	40	14	ug/L			07/26/21 18:12	40
Toluene	34 J		40	20	ug/L			07/26/21 18:12	40
trans-1,2-Dichloroethene	36	U	40	36	ug/L			07/26/21 18:12	40
trans-1,3-Dichloropropene	15	U	40	15	ug/L			07/26/21 18:12	40
Trichloroethene	18	U	40	18	ug/L			07/26/21 18:12	40
Trichlorofluoromethane	35	U	40	35	ug/L			07/26/21 18:12	40
Vinyl chloride	36	U	40	36	ug/L			07/26/21 18:12	40
Xylenes, Total	350		80	26	ug/L			07/26/21 18:12	40
Chlorobromomethane	35	U	40	35	ug/L			07/26/21 18:12	40

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	97		80 - 120		07/26/21 18:12	40
<i>1,2-Dichloroethane-d4 (Surr)</i>	105		77 - 120		07/26/21 18:12	40
<i>4-Bromofluorobenzene (Surr)</i>	109		73 - 120		07/26/21 18:12	40
<i>Dibromofluoromethane (Surr)</i>	111		75 - 123		07/26/21 18:12	40

Client Sample ID: WG-11230275-072321-SG-003

Lab Sample ID: 480-187600-3

Date Collected: 07/23/21 09:10

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	8.2	U	10	8.2	ug/L			07/27/21 12:42	10
1,1,2,2-Tetrachloroethane	2.1	U	10	2.1	ug/L			07/27/21 12:42	10
1,1,2-Trichloroethane	2.3	U	10	2.3	ug/L			07/27/21 12:42	10
1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	U	10	3.1	ug/L			07/27/21 12:42	10
1,1-Dichloroethane	3.8	U	10	3.8	ug/L			07/27/21 12:42	10
1,1-Dichloroethene	2.9	U	10	2.9	ug/L			07/27/21 12:42	10
1,2,4-Trichlorobenzene	4.1	U	10	4.1	ug/L			07/27/21 12:42	10
1,2-Dibromo-3-Chloropropane	3.9	U	10	3.9	ug/L			07/27/21 12:42	10
1,2-Dichlorobenzene	7.9	U	10	7.9	ug/L			07/27/21 12:42	10
1,2,3-Trichlorobenzene	4.1	U	10	4.1	ug/L			07/27/21 12:42	10
1,2-Dichloroethane	2.1	U	10	2.1	ug/L			07/27/21 12:42	10
1,2-Dichloropropane	7.2	U	10	7.2	ug/L			07/27/21 12:42	10
1,3-Dichlorobenzene	7.8	U	10	7.8	ug/L			07/27/21 12:42	10
1,4-Dichlorobenzene	8.4	U	10	8.4	ug/L			07/27/21 12:42	10
2-Butanone (MEK)	13	U	100	13	ug/L			07/27/21 12:42	10
2-Hexanone	12	U	50	12	ug/L			07/27/21 12:42	10
4-Methyl-2-pentanone (MIBK)	21	U	50	21	ug/L			07/27/21 12:42	10
Acetone	30	U	100	30	ug/L			07/27/21 12:42	10
Benzene	4.1	U	10	4.1	ug/L			07/27/21 12:42	10
Bromodichloromethane	3.9	U	10	3.9	ug/L			07/27/21 12:42	10
Bromoform	2.6	U	10	2.6	ug/L			07/27/21 12:42	10
Bromomethane	6.9	U	10	6.9	ug/L			07/27/21 12:42	10
Carbon disulfide	1.9	U	10	1.9	ug/L			07/27/21 12:42	10

Eurofins TestAmerica, Buffalo

Client Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: WG-11230275-072321-SG-003

Lab Sample ID: 480-187600-3

Date Collected: 07/23/21 09:10

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	2.7	U	10	2.7	ug/L			07/27/21 12:42	10
Chlorobenzene	7.5	U	10	7.5	ug/L			07/27/21 12:42	10
Dibromochloromethane	3.2	U	10	3.2	ug/L			07/27/21 12:42	10
Chloroethane	3.2	U	10	3.2	ug/L			07/27/21 12:42	10
Chloroform	3.4	U	10	3.4	ug/L			07/27/21 12:42	10
Chloromethane	3.5	U	10	3.5	ug/L			07/27/21 12:42	10
cis-1,2-Dichloroethene	8.1	U	10	8.1	ug/L			07/27/21 12:42	10
cis-1,3-Dichloropropene	3.6	U	10	3.6	ug/L			07/27/21 12:42	10
Cyclohexane	84		10	1.8	ug/L			07/27/21 12:42	10
Dichlorodifluoromethane	6.8	U	10	6.8	ug/L			07/27/21 12:42	10
Ethylbenzene	13		10	7.4	ug/L			07/27/21 12:42	10
1,2-Dibromoethane	7.3	U	10	7.3	ug/L			07/27/21 12:42	10
Isopropylbenzene	24		10	7.9	ug/L			07/27/21 12:42	10
Methyl acetate	13	U F1	25	13	ug/L			07/27/21 12:42	10
Methyl tert-butyl ether	1.6	U	10	1.6	ug/L			07/27/21 12:42	10
Methylcyclohexane	17		10	1.6	ug/L			07/27/21 12:42	10
Methylene Chloride	4.4	U	10	4.4	ug/L			07/27/21 12:42	10
Styrene	7.3	U	10	7.3	ug/L			07/27/21 12:42	10
Tetrachloroethene	3.6	U	10	3.6	ug/L			07/27/21 12:42	10
Toluene	5.1	U	10	5.1	ug/L			07/27/21 12:42	10
trans-1,2-Dichloroethene	9.0	U	10	9.0	ug/L			07/27/21 12:42	10
trans-1,3-Dichloropropene	3.7	U	10	3.7	ug/L			07/27/21 12:42	10
Trichloroethene	4.6	U	10	4.6	ug/L			07/27/21 12:42	10
Trichlorofluoromethane	8.8	U	10	8.8	ug/L			07/27/21 12:42	10
Vinyl chloride	9.0	U	10	9.0	ug/L			07/27/21 12:42	10
Xylenes, Total	6.6	U	20	6.6	ug/L			07/27/21 12:42	10
Chlorobromomethane	8.7	U	10	8.7	ug/L			07/27/21 12:42	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	96		80 - 120		07/27/21 12:42	10
<i>1,2-Dichloroethane-d4 (Surr)</i>	110		77 - 120		07/27/21 12:42	10
<i>4-Bromofluorobenzene (Surr)</i>	106		73 - 120		07/27/21 12:42	10
<i>Dibromofluoromethane (Surr)</i>	117		75 - 123		07/27/21 12:42	10

Client Sample ID: TB-11230275-072321-SG

Lab Sample ID: 480-187600-4

Date Collected: 07/23/21 00:00

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.82	U	1.0	0.82	ug/L			07/26/21 18:58	1
1,1,2,2-Tetrachloroethane	0.21	U	1.0	0.21	ug/L			07/26/21 18:58	1
1,1,2-Trichloroethane	0.23	U	1.0	0.23	ug/L			07/26/21 18:58	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.31	U	1.0	0.31	ug/L			07/26/21 18:58	1
1,1-Dichloroethane	0.38	U	1.0	0.38	ug/L			07/26/21 18:58	1
1,1-Dichloroethene	0.29	U	1.0	0.29	ug/L			07/26/21 18:58	1
1,2,4-Trichlorobenzene	0.41	U	1.0	0.41	ug/L			07/26/21 18:58	1
1,2-Dibromo-3-Chloropropane	0.39	U	1.0	0.39	ug/L			07/26/21 18:58	1
1,2-Dichlorobenzene	0.79	U	1.0	0.79	ug/L			07/26/21 18:58	1
1,2,3-Trichlorobenzene	0.41	U	1.0	0.41	ug/L			07/26/21 18:58	1

Euofins TestAmerica, Buffalo

Client Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: TB-11230275-072321-SG

Lab Sample ID: 480-187600-4

Date Collected: 07/23/21 00:00

Matrix: Water

Date Received: 07/23/21 10:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	0.21	U	1.0	0.21	ug/L			07/26/21 18:58	1
1,2-Dichloropropane	0.72	U	1.0	0.72	ug/L			07/26/21 18:58	1
1,3-Dichlorobenzene	0.78	U	1.0	0.78	ug/L			07/26/21 18:58	1
1,4-Dichlorobenzene	0.84	U	1.0	0.84	ug/L			07/26/21 18:58	1
2-Butanone (MEK)	1.3	U	10	1.3	ug/L			07/26/21 18:58	1
2-Hexanone	1.2	U	5.0	1.2	ug/L			07/26/21 18:58	1
4-Methyl-2-pentanone (MIBK)	2.1	U	5.0	2.1	ug/L			07/26/21 18:58	1
Acetone	3.0	U	10	3.0	ug/L			07/26/21 18:58	1
Benzene	0.41	U	1.0	0.41	ug/L			07/26/21 18:58	1
Bromodichloromethane	0.39	U	1.0	0.39	ug/L			07/26/21 18:58	1
Bromoform	0.26	U	1.0	0.26	ug/L			07/26/21 18:58	1
Bromomethane	0.69	U	1.0	0.69	ug/L			07/26/21 18:58	1
Carbon disulfide	0.19	U	1.0	0.19	ug/L			07/26/21 18:58	1
Carbon tetrachloride	0.27	U	1.0	0.27	ug/L			07/26/21 18:58	1
Chlorobenzene	0.75	U	1.0	0.75	ug/L			07/26/21 18:58	1
Dibromochloromethane	0.32	U	1.0	0.32	ug/L			07/26/21 18:58	1
Chloroethane	0.32	U	1.0	0.32	ug/L			07/26/21 18:58	1
Chloroform	0.34	U	1.0	0.34	ug/L			07/26/21 18:58	1
Chloromethane	0.35	U	1.0	0.35	ug/L			07/26/21 18:58	1
cis-1,2-Dichloroethene	0.81	U	1.0	0.81	ug/L			07/26/21 18:58	1
cis-1,3-Dichloropropene	0.36	U	1.0	0.36	ug/L			07/26/21 18:58	1
Cyclohexane	0.18	U	1.0	0.18	ug/L			07/26/21 18:58	1
Dichlorodifluoromethane	0.68	U	1.0	0.68	ug/L			07/26/21 18:58	1
Ethylbenzene	0.74	U	1.0	0.74	ug/L			07/26/21 18:58	1
1,2-Dibromoethane	0.73	U	1.0	0.73	ug/L			07/26/21 18:58	1
Isopropylbenzene	0.79	U	1.0	0.79	ug/L			07/26/21 18:58	1
Methyl acetate	1.3	U	2.5	1.3	ug/L			07/26/21 18:58	1
Methyl tert-butyl ether	0.16	U	1.0	0.16	ug/L			07/26/21 18:58	1
Methylcyclohexane	0.16	U	1.0	0.16	ug/L			07/26/21 18:58	1
Methylene Chloride	0.44	U	1.0	0.44	ug/L			07/26/21 18:58	1
Styrene	0.73	U	1.0	0.73	ug/L			07/26/21 18:58	1
Tetrachloroethene	0.36	U	1.0	0.36	ug/L			07/26/21 18:58	1
Toluene	0.51	U	1.0	0.51	ug/L			07/26/21 18:58	1
trans-1,2-Dichloroethene	0.90	U	1.0	0.90	ug/L			07/26/21 18:58	1
trans-1,3-Dichloropropene	0.37	U	1.0	0.37	ug/L			07/26/21 18:58	1
Trichloroethene	0.46	U	1.0	0.46	ug/L			07/26/21 18:58	1
Trichlorofluoromethane	0.88	U	1.0	0.88	ug/L			07/26/21 18:58	1
Vinyl chloride	0.90	U	1.0	0.90	ug/L			07/26/21 18:58	1
Xylenes, Total	0.66	U	2.0	0.66	ug/L			07/26/21 18:58	1
Chlorobromomethane	0.87	U	1.0	0.87	ug/L			07/26/21 18:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		80 - 120		07/26/21 18:58	1
1,2-Dichloroethane-d4 (Surr)	113		77 - 120		07/26/21 18:58	1
4-Bromofluorobenzene (Surr)	105		73 - 120		07/26/21 18:58	1
Dibromofluoromethane (Surr)	117		75 - 123		07/26/21 18:58	1

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TOL	DCA	BFB	DBFM
		(80-120)	(77-120)	(73-120)	(75-123)
480-187600-1	WG-11230275-072321-SG-001	94	101	107	109
480-187600-2	WG-11230275-072321-SG-002	97	105	109	111
480-187600-3	WG-11230275-072321-SG-003	96	110	106	117
480-187600-3 MS	WG-11230275-072321-SG-003	97	102	109	109
480-187600-3 MSD	WG-11230275-072321-SG-003	98	104	111	107
480-187600-4	TB-11230275-072321-SG	98	113	105	117
LCS 480-590365/6	Lab Control Sample	95	105	105	107
LCS 480-590508/5	Lab Control Sample	96	103	109	107
MB 480-590365/8	Method Blank	98	109	107	114
MB 480-590508/7	Method Blank	94	110	105	114

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: MB 480-590365/8
Matrix: Water
Analysis Batch: 590365

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1-Trichloroethane	0.82	U	1.0	0.82	ug/L			07/26/21 11:13	1
1,1,1,2-Tetrachloroethane	0.21	U	1.0	0.21	ug/L			07/26/21 11:13	1
1,1,2-Trichloroethane	0.23	U	1.0	0.23	ug/L			07/26/21 11:13	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.31	U	1.0	0.31	ug/L			07/26/21 11:13	1
1,1-Dichloroethane	0.38	U	1.0	0.38	ug/L			07/26/21 11:13	1
1,1-Dichloroethene	0.29	U	1.0	0.29	ug/L			07/26/21 11:13	1
1,2,4-Trichlorobenzene	0.41	U	1.0	0.41	ug/L			07/26/21 11:13	1
1,2-Dibromo-3-Chloropropane	0.39	U	1.0	0.39	ug/L			07/26/21 11:13	1
1,2-Dichlorobenzene	0.79	U	1.0	0.79	ug/L			07/26/21 11:13	1
1,2,3-Trichlorobenzene	0.41	U	1.0	0.41	ug/L			07/26/21 11:13	1
1,2-Dichloroethane	0.21	U	1.0	0.21	ug/L			07/26/21 11:13	1
1,2-Dichloropropane	0.72	U	1.0	0.72	ug/L			07/26/21 11:13	1
1,3-Dichlorobenzene	0.78	U	1.0	0.78	ug/L			07/26/21 11:13	1
1,4-Dichlorobenzene	0.84	U	1.0	0.84	ug/L			07/26/21 11:13	1
2-Butanone (MEK)	1.3	U	10	1.3	ug/L			07/26/21 11:13	1
2-Hexanone	1.2	U	5.0	1.2	ug/L			07/26/21 11:13	1
4-Methyl-2-pentanone (MIBK)	2.1	U	5.0	2.1	ug/L			07/26/21 11:13	1
Acetone	3.0	U	10	3.0	ug/L			07/26/21 11:13	1
Benzene	0.41	U	1.0	0.41	ug/L			07/26/21 11:13	1
Bromodichloromethane	0.39	U	1.0	0.39	ug/L			07/26/21 11:13	1
Bromoform	0.26	U	1.0	0.26	ug/L			07/26/21 11:13	1
Bromomethane	0.69	U	1.0	0.69	ug/L			07/26/21 11:13	1
Carbon disulfide	0.19	U	1.0	0.19	ug/L			07/26/21 11:13	1
Carbon tetrachloride	0.27	U	1.0	0.27	ug/L			07/26/21 11:13	1
Chlorobenzene	0.75	U	1.0	0.75	ug/L			07/26/21 11:13	1
Dibromochloromethane	0.32	U	1.0	0.32	ug/L			07/26/21 11:13	1
Chloroethane	0.32	U	1.0	0.32	ug/L			07/26/21 11:13	1
Chloroform	0.34	U	1.0	0.34	ug/L			07/26/21 11:13	1
Chloromethane	0.35	U	1.0	0.35	ug/L			07/26/21 11:13	1
cis-1,2-Dichloroethene	0.81	U	1.0	0.81	ug/L			07/26/21 11:13	1
cis-1,3-Dichloropropene	0.36	U	1.0	0.36	ug/L			07/26/21 11:13	1
Cyclohexane	0.18	U	1.0	0.18	ug/L			07/26/21 11:13	1
Dichlorodifluoromethane	0.68	U	1.0	0.68	ug/L			07/26/21 11:13	1
Ethylbenzene	0.74	U	1.0	0.74	ug/L			07/26/21 11:13	1
1,2-Dibromoethane	0.73	U	1.0	0.73	ug/L			07/26/21 11:13	1
Isopropylbenzene	0.79	U	1.0	0.79	ug/L			07/26/21 11:13	1
Methyl acetate	1.3	U	2.5	1.3	ug/L			07/26/21 11:13	1
Methyl tert-butyl ether	0.16	U	1.0	0.16	ug/L			07/26/21 11:13	1
Methylcyclohexane	0.16	U	1.0	0.16	ug/L			07/26/21 11:13	1
Methylene Chloride	0.44	U	1.0	0.44	ug/L			07/26/21 11:13	1
Styrene	0.73	U	1.0	0.73	ug/L			07/26/21 11:13	1
Tetrachloroethene	0.36	U	1.0	0.36	ug/L			07/26/21 11:13	1
Toluene	0.51	U	1.0	0.51	ug/L			07/26/21 11:13	1
trans-1,2-Dichloroethene	0.90	U	1.0	0.90	ug/L			07/26/21 11:13	1
trans-1,3-Dichloropropene	0.37	U	1.0	0.37	ug/L			07/26/21 11:13	1
Trichloroethene	0.46	U	1.0	0.46	ug/L			07/26/21 11:13	1
Trichlorofluoromethane	0.88	U	1.0	0.88	ug/L			07/26/21 11:13	1
Vinyl chloride	0.90	U	1.0	0.90	ug/L			07/26/21 11:13	1

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: MB 480-590365/8
Matrix: Water
Analysis Batch: 590365

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Xylenes, Total	0.66	U	2.0	0.66	ug/L			07/26/21 11:13	1
Chlorobromomethane	0.87	U	1.0	0.87	ug/L			07/26/21 11:13	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Toluene-d8 (Surr)	98		80 - 120		07/26/21 11:13	1
1,2-Dichloroethane-d4 (Surr)	109		77 - 120		07/26/21 11:13	1
4-Bromofluorobenzene (Surr)	107		73 - 120		07/26/21 11:13	1
Dibromofluoromethane (Surr)	114		75 - 123		07/26/21 11:13	1

Lab Sample ID: LCS 480-590365/6
Matrix: Water
Analysis Batch: 590365

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
1,1,1-Trichloroethane	25.0	27.5		ug/L		110	73 - 126
1,1,1,2-Tetrachloroethane	25.0	24.8		ug/L		99	76 - 120
1,1,2-Trichloroethane	25.0	24.2		ug/L		97	76 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	27.4		ug/L		110	61 - 148
1,1-Dichloroethane	25.0	25.4		ug/L		101	77 - 120
1,1-Dichloroethene	25.0	26.7		ug/L		107	66 - 127
1,2,4-Trichlorobenzene	25.0	25.1		ug/L		101	79 - 122
1,2-Dibromo-3-Chloropropane	25.0	22.6		ug/L		90	56 - 134
1,2-Dichlorobenzene	25.0	24.4		ug/L		97	80 - 124
1,2,3-Trichlorobenzene	25.0	25.2		ug/L		101	75 - 123
1,2-Dichloroethane	25.0	24.8		ug/L		99	75 - 120
1,2-Dichloropropane	25.0	26.8		ug/L		107	76 - 120
1,3-Dichlorobenzene	25.0	25.6		ug/L		102	77 - 120
1,4-Dichlorobenzene	25.0	25.6		ug/L		103	80 - 120
2-Butanone (MEK)	125	137		ug/L		110	57 - 140
2-Hexanone	125	120		ug/L		96	65 - 127
4-Methyl-2-pentanone (MIBK)	125	120		ug/L		96	71 - 125
Acetone	125	173		ug/L		138	56 - 142
Benzene	25.0	27.4		ug/L		110	71 - 124
Bromodichloromethane	25.0	25.9		ug/L		104	80 - 122
Bromoform	25.0	29.7		ug/L		119	61 - 132
Bromomethane	25.0	30.5		ug/L		122	55 - 144
Carbon disulfide	25.0	28.0		ug/L		112	59 - 134
Carbon tetrachloride	25.0	27.1		ug/L		109	72 - 134
Chlorobenzene	25.0	25.1		ug/L		100	80 - 120
Dibromochloromethane	25.0	26.7		ug/L		107	75 - 125
Chloroethane	25.0	26.9		ug/L		108	69 - 136
Chloroform	25.0	25.7		ug/L		103	73 - 127
Chloromethane	25.0	24.1		ug/L		97	68 - 124
cis-1,2-Dichloroethene	25.0	27.4		ug/L		109	74 - 124
cis-1,3-Dichloropropene	25.0	27.8		ug/L		111	74 - 124
Cyclohexane	25.0	23.4		ug/L		93	59 - 135
Dichlorodifluoromethane	25.0	23.2		ug/L		93	59 - 135
Ethylbenzene	25.0	25.5		ug/L		102	77 - 123

Eurofins TestAmerica, Buffalo

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: LCS 480-590365/6
Matrix: Water
Analysis Batch: 590365

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	25.0	26.2		ug/L		105	77 - 120
Isopropylbenzene	25.0	25.6		ug/L		102	77 - 122
Methyl acetate	50.0	51.1		ug/L		102	74 - 133
Methyl tert-butyl ether	25.0	25.7		ug/L		103	77 - 120
Methylcyclohexane	25.0	25.3		ug/L		101	68 - 134
Methylene Chloride	25.0	25.3		ug/L		101	75 - 124
Styrene	25.0	25.6		ug/L		102	80 - 120
Tetrachloroethene	25.0	27.9		ug/L		111	74 - 122
Toluene	25.0	24.6		ug/L		98	80 - 122
trans-1,2-Dichloroethene	25.0	25.4		ug/L		101	73 - 127
trans-1,3-Dichloropropene	25.0	25.9		ug/L		103	80 - 120
Trichloroethene	25.0	28.5		ug/L		114	74 - 123
Trichlorofluoromethane	25.0	28.6		ug/L		115	62 - 150
Vinyl chloride	25.0	28.2		ug/L		113	65 - 133
Chlorobromomethane	25.0	27.9		ug/L		112	72 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	95		80 - 120
1,2-Dichloroethane-d4 (Surr)	105		77 - 120
4-Bromofluorobenzene (Surr)	105		73 - 120
Dibromofluoromethane (Surr)	107		75 - 123

Lab Sample ID: MB 480-590508/7
Matrix: Water
Analysis Batch: 590508

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1-Trichloroethane	0.82	U	1.0	0.82	ug/L			07/27/21 11:23	1
1,1,2,2-Tetrachloroethane	0.21	U	1.0	0.21	ug/L			07/27/21 11:23	1
1,1,2-Trichloroethane	0.23	U	1.0	0.23	ug/L			07/27/21 11:23	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.31	U	1.0	0.31	ug/L			07/27/21 11:23	1
1,1-Dichloroethane	0.38	U	1.0	0.38	ug/L			07/27/21 11:23	1
1,1-Dichloroethene	0.29	U	1.0	0.29	ug/L			07/27/21 11:23	1
1,2,4-Trichlorobenzene	0.41	U	1.0	0.41	ug/L			07/27/21 11:23	1
1,2-Dibromo-3-Chloropropane	0.39	U	1.0	0.39	ug/L			07/27/21 11:23	1
1,2-Dichlorobenzene	0.79	U	1.0	0.79	ug/L			07/27/21 11:23	1
1,2,3-Trichlorobenzene	0.41	U	1.0	0.41	ug/L			07/27/21 11:23	1
1,2-Dichloroethane	0.21	U	1.0	0.21	ug/L			07/27/21 11:23	1
1,2-Dichloropropane	0.72	U	1.0	0.72	ug/L			07/27/21 11:23	1
1,3-Dichlorobenzene	0.78	U	1.0	0.78	ug/L			07/27/21 11:23	1
1,4-Dichlorobenzene	0.84	U	1.0	0.84	ug/L			07/27/21 11:23	1
2-Butanone (MEK)	1.3	U	10	1.3	ug/L			07/27/21 11:23	1
2-Hexanone	1.2	U	5.0	1.2	ug/L			07/27/21 11:23	1
4-Methyl-2-pentanone (MIBK)	2.1	U	5.0	2.1	ug/L			07/27/21 11:23	1
Acetone	3.0	U	10	3.0	ug/L			07/27/21 11:23	1
Benzene	0.41	U	1.0	0.41	ug/L			07/27/21 11:23	1
Bromodichloromethane	0.39	U	1.0	0.39	ug/L			07/27/21 11:23	1
Bromoform	0.26	U	1.0	0.26	ug/L			07/27/21 11:23	1

Eurofins TestAmerica, Buffalo

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: MB 480-590508/7
Matrix: Water
Analysis Batch: 590508

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	0.69	U	1.0	0.69	ug/L			07/27/21 11:23	1
Carbon disulfide	0.19	U	1.0	0.19	ug/L			07/27/21 11:23	1
Carbon tetrachloride	0.27	U	1.0	0.27	ug/L			07/27/21 11:23	1
Chlorobenzene	0.75	U	1.0	0.75	ug/L			07/27/21 11:23	1
Dibromochloromethane	0.32	U	1.0	0.32	ug/L			07/27/21 11:23	1
Chloroethane	0.32	U	1.0	0.32	ug/L			07/27/21 11:23	1
Chloroform	0.34	U	1.0	0.34	ug/L			07/27/21 11:23	1
Chloromethane	0.35	U	1.0	0.35	ug/L			07/27/21 11:23	1
cis-1,2-Dichloroethene	0.81	U	1.0	0.81	ug/L			07/27/21 11:23	1
cis-1,3-Dichloropropene	0.36	U	1.0	0.36	ug/L			07/27/21 11:23	1
Cyclohexane	0.18	U	1.0	0.18	ug/L			07/27/21 11:23	1
Dichlorodifluoromethane	0.68	U	1.0	0.68	ug/L			07/27/21 11:23	1
Ethylbenzene	0.74	U	1.0	0.74	ug/L			07/27/21 11:23	1
1,2-Dibromoethane	0.73	U	1.0	0.73	ug/L			07/27/21 11:23	1
Isopropylbenzene	0.79	U	1.0	0.79	ug/L			07/27/21 11:23	1
Methyl acetate	1.3	U	2.5	1.3	ug/L			07/27/21 11:23	1
Methyl tert-butyl ether	0.16	U	1.0	0.16	ug/L			07/27/21 11:23	1
Methylcyclohexane	0.16	U	1.0	0.16	ug/L			07/27/21 11:23	1
Methylene Chloride	0.44	U	1.0	0.44	ug/L			07/27/21 11:23	1
Styrene	0.73	U	1.0	0.73	ug/L			07/27/21 11:23	1
Tetrachloroethene	0.36	U	1.0	0.36	ug/L			07/27/21 11:23	1
Toluene	0.51	U	1.0	0.51	ug/L			07/27/21 11:23	1
trans-1,2-Dichloroethene	0.90	U	1.0	0.90	ug/L			07/27/21 11:23	1
trans-1,3-Dichloropropene	0.37	U	1.0	0.37	ug/L			07/27/21 11:23	1
Trichloroethene	0.46	U	1.0	0.46	ug/L			07/27/21 11:23	1
Trichlorofluoromethane	0.88	U	1.0	0.88	ug/L			07/27/21 11:23	1
Vinyl chloride	0.90	U	1.0	0.90	ug/L			07/27/21 11:23	1
Xylenes, Total	0.66	U	2.0	0.66	ug/L			07/27/21 11:23	1
Chlorobromomethane	0.87	U	1.0	0.87	ug/L			07/27/21 11:23	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	94		80 - 120		07/27/21 11:23	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	110		77 - 120		07/27/21 11:23	1
<i>4-Bromofluorobenzene (Surr)</i>	105		73 - 120		07/27/21 11:23	1
<i>Dibromofluoromethane (Surr)</i>	114		75 - 123		07/27/21 11:23	1

Lab Sample ID: LCS 480-590508/5
Matrix: Water
Analysis Batch: 590508

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	25.0	25.1		ug/L		100	73 - 126
1,1,2,2-Tetrachloroethane	25.0	25.9		ug/L		104	76 - 120
1,1,2-Trichloroethane	25.0	25.1		ug/L		100	76 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	27.4		ug/L		110	61 - 148
1,1-Dichloroethane	25.0	25.6		ug/L		102	77 - 120
1,1-Dichloroethene	25.0	28.3		ug/L		113	66 - 127
1,2,4-Trichlorobenzene	25.0	24.9		ug/L		100	79 - 122

Eurofins TestAmerica, Buffalo

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: LCS 480-590508/5

Matrix: Water

Analysis Batch: 590508

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromo-3-Chloropropane	25.0	22.2		ug/L		89	56 - 134
1,2-Dichlorobenzene	25.0	25.6		ug/L		102	80 - 124
1,2,3-Trichlorobenzene	25.0	25.9		ug/L		104	75 - 123
1,2-Dichloroethane	25.0	25.5		ug/L		102	75 - 120
1,2-Dichloropropane	25.0	27.0		ug/L		108	76 - 120
1,3-Dichlorobenzene	25.0	25.5		ug/L		102	77 - 120
1,4-Dichlorobenzene	25.0	25.9		ug/L		104	80 - 120
2-Butanone (MEK)	125	139		ug/L		111	57 - 140
2-Hexanone	125	126		ug/L		101	65 - 127
4-Methyl-2-pentanone (MIBK)	125	125		ug/L		100	71 - 125
Acetone	125	172		ug/L		138	56 - 142
Benzene	25.0	27.8		ug/L		111	71 - 124
Bromodichloromethane	25.0	26.1		ug/L		105	80 - 122
Bromoform	25.0	28.2		ug/L		113	61 - 132
Bromomethane	25.0	28.0		ug/L		112	55 - 144
Carbon disulfide	25.0	27.3		ug/L		109	59 - 134
Carbon tetrachloride	25.0	27.0		ug/L		108	72 - 134
Chlorobenzene	25.0	25.5		ug/L		102	80 - 120
Dibromochloromethane	25.0	26.5		ug/L		106	75 - 125
Chloroethane	25.0	24.7		ug/L		99	69 - 136
Chloroform	25.0	25.7		ug/L		103	73 - 127
Chloromethane	25.0	22.1		ug/L		88	68 - 124
cis-1,2-Dichloroethene	25.0	27.2		ug/L		109	74 - 124
cis-1,3-Dichloropropene	25.0	28.2		ug/L		113	74 - 124
Cyclohexane	25.0	22.6		ug/L		90	59 - 135
Dichlorodifluoromethane	25.0	20.2		ug/L		81	59 - 135
Ethylbenzene	25.0	25.4		ug/L		101	77 - 123
1,2-Dibromoethane	25.0	26.2		ug/L		105	77 - 120
Isopropylbenzene	25.0	25.4		ug/L		102	77 - 122
Methyl acetate	50.0	52.3		ug/L		105	74 - 133
Methyl tert-butyl ether	25.0	26.0		ug/L		104	77 - 120
Methylcyclohexane	25.0	24.5		ug/L		98	68 - 134
Methylene Chloride	25.0	25.7		ug/L		103	75 - 124
Styrene	25.0	26.0		ug/L		104	80 - 120
Tetrachloroethene	25.0	28.7		ug/L		115	74 - 122
Toluene	25.0	24.3		ug/L		97	80 - 122
trans-1,2-Dichloroethene	25.0	24.7		ug/L		99	73 - 127
trans-1,3-Dichloropropene	25.0	26.5		ug/L		106	80 - 120
Trichloroethene	25.0	27.5		ug/L		110	74 - 123
Trichlorofluoromethane	25.0	26.1		ug/L		104	62 - 150
Vinyl chloride	25.0	25.9		ug/L		104	65 - 133
Chlorobromomethane	25.0	27.8		ug/L		111	72 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	96		80 - 120
1,2-Dichloroethane-d4 (Surr)	103		77 - 120
4-Bromofluorobenzene (Surr)	109		73 - 120
Dibromofluoromethane (Surr)	107		75 - 123

Eurofins TestAmerica, Buffalo

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: 480-187600-3 MS

Matrix: Water

Analysis Batch: 590508

Client Sample ID: WG-11230275-072321-SG-003

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec. Limits
	Result	Qualifier	Added	Result	Qualifier				
1,1,1-Trichloroethane	8.2	U	250	284		ug/L		114	73 - 126
1,1,2,2-Tetrachloroethane	2.1	U	250	254		ug/L		101	76 - 120
1,1,2-Trichloroethane	2.3	U	250	271		ug/L		108	76 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	U	250	250		ug/L		100	61 - 148
1,1-Dichloroethane	3.8	U	250	269		ug/L		108	77 - 120
1,1-Dichloroethene	2.9	U	250	283		ug/L		113	66 - 127
1,2,4-Trichlorobenzene	4.1	U	250	262		ug/L		105	79 - 122
1,2-Dibromo-3-Chloropropane	3.9	U	250	227		ug/L		91	56 - 134
1,2-Dichlorobenzene	7.9	U	250	252		ug/L		101	80 - 124
1,2,3-Trichlorobenzene	4.1	U	250	257		ug/L		103	75 - 123
1,2-Dichloroethane	2.1	U	250	259		ug/L		104	75 - 120
1,2-Dichloropropane	7.2	U	250	277		ug/L		111	76 - 120
1,3-Dichlorobenzene	7.8	U	250	254		ug/L		101	77 - 120
1,4-Dichlorobenzene	8.4	U	250	255		ug/L		102	78 - 124
2-Butanone (MEK)	13	U	1250	1400		ug/L		112	57 - 140
2-Hexanone	12	U	1250	1300		ug/L		104	65 - 127
4-Methyl-2-pentanone (MIBK)	21	U	1250	1290		ug/L		104	71 - 125
Acetone	30	U	1250	1560		ug/L		125	56 - 142
Benzene	4.1	U	250	294		ug/L		118	71 - 124
Bromodichloromethane	3.9	U	250	275		ug/L		110	80 - 122
Bromoform	2.6	U	250	292		ug/L		117	61 - 132
Bromomethane	6.9	U	250	304		ug/L		122	55 - 144
Carbon disulfide	1.9	U	250	279		ug/L		112	59 - 134
Carbon tetrachloride	2.7	U	250	293		ug/L		117	72 - 134
Chlorobenzene	7.5	U	250	278		ug/L		111	80 - 120
Dibromochloromethane	3.2	U	250	267		ug/L		107	75 - 125
Chloroethane	3.2	U	250	280		ug/L		112	69 - 136
Chloroform	3.4	U	250	267		ug/L		107	73 - 127
Chloromethane	3.5	U	250	241		ug/L		96	68 - 124
cis-1,2-Dichloroethene	8.1	U	250	301		ug/L		120	74 - 124
cis-1,3-Dichloropropene	3.6	U	250	276		ug/L		111	74 - 124
Cyclohexane	84		250	335		ug/L		100	59 - 135
Dichlorodifluoromethane	6.8	U	250	231		ug/L		92	59 - 135
Ethylbenzene	13		250	291		ug/L		111	77 - 123
1,2-Dibromoethane	7.3	U	250	278		ug/L		111	77 - 120
Isopropylbenzene	24		250	288		ug/L		106	77 - 122
Methyl acetate	13	U F1	500	881	F1	ug/L		176	74 - 133
Methyl tert-butyl ether	1.6	U	250	263		ug/L		105	77 - 120
Methylcyclohexane	17		250	293		ug/L		111	68 - 134
Methylene Chloride	4.4	U	250	275		ug/L		110	75 - 124
Styrene	7.3	U	250	281		ug/L		112	80 - 120
Tetrachloroethene	3.6	U	250	302		ug/L		121	74 - 122
Toluene	5.1	U	250	270		ug/L		108	80 - 122
trans-1,2-Dichloroethene	9.0	U	250	267		ug/L		107	73 - 127
trans-1,3-Dichloropropene	3.7	U	250	272		ug/L		109	80 - 120
Trichloroethene	4.6	U	250	290		ug/L		116	74 - 123
Trichlorofluoromethane	8.8	U	250	301		ug/L		121	62 - 150
Vinyl chloride	9.0	U	250	285		ug/L		114	65 - 133

Eurofins TestAmerica, Buffalo

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: 480-187600-3 MS

Client Sample ID: WG-11230275-072321-SG-003

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 590508

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorobromomethane	8.7	U	250	286		ug/L		114	72 - 130
Surrogate									
	MS %Recovery	MS Qualifier	Limits						
Toluene-d8 (Surr)	97		80 - 120						
1,2-Dichloroethane-d4 (Surr)	102		77 - 120						
4-Bromofluorobenzene (Surr)	109		73 - 120						
Dibromofluoromethane (Surr)	109		75 - 123						

Lab Sample ID: 480-187600-3 MSD

Client Sample ID: WG-11230275-072321-SG-003

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 590508

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	8.2	U	250	272		ug/L		109	73 - 126	4	15
1,1,2,2-Tetrachloroethane	2.1	U	250	253		ug/L		101	76 - 120	0	15
1,1,2-Trichloroethane	2.3	U	250	261		ug/L		105	76 - 122	4	15
1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	U	250	232		ug/L		93	61 - 148	8	20
1,1-Dichloroethane	3.8	U	250	260		ug/L		104	77 - 120	4	20
1,1-Dichloroethene	2.9	U	250	279		ug/L		112	66 - 127	1	16
1,2,4-Trichlorobenzene	4.1	U	250	267		ug/L		107	79 - 122	2	20
1,2-Dibromo-3-Chloropropane	3.9	U	250	252		ug/L		101	56 - 134	10	15
1,2-Dichlorobenzene	7.9	U	250	252		ug/L		101	80 - 124	0	20
1,2,3-Trichlorobenzene	4.1	U	250	259		ug/L		103	75 - 123	1	20
1,2-Dichloroethane	2.1	U	250	258		ug/L		103	75 - 120	0	20
1,2-Dichloropropane	7.2	U	250	273		ug/L		109	76 - 120	2	20
1,3-Dichlorobenzene	7.8	U	250	256		ug/L		103	77 - 120	1	20
1,4-Dichlorobenzene	8.4	U	250	257		ug/L		103	78 - 124	1	20
2-Butanone (MEK)	13	U	1250	1380		ug/L		111	57 - 140	1	20
2-Hexanone	12	U	1250	1240		ug/L		99	65 - 127	4	15
4-Methyl-2-pentanone (MIBK)	21	U	1250	1270		ug/L		102	71 - 125	2	35
Acetone	30	U	1250	1510		ug/L		121	56 - 142	3	15
Benzene	4.1	U	250	278		ug/L		111	71 - 124	6	13
Bromodichloromethane	3.9	U	250	259		ug/L		104	80 - 122	6	15
Bromoform	2.6	U	250	290		ug/L		116	61 - 132	1	15
Bromomethane	6.9	U	250	284		ug/L		114	55 - 144	7	15
Carbon disulfide	1.9	U	250	259		ug/L		104	59 - 134	7	15
Carbon tetrachloride	2.7	U	250	276		ug/L		110	72 - 134	6	15
Chlorobenzene	7.5	U	250	264		ug/L		105	80 - 120	5	25
Dibromochloromethane	3.2	U	250	257		ug/L		103	75 - 125	4	15
Chloroethane	3.2	U	250	262		ug/L		105	69 - 136	7	15
Chloroform	3.4	U	250	265		ug/L		106	73 - 127	1	20
Chloromethane	3.5	U	250	228		ug/L		91	68 - 124	6	15
cis-1,2-Dichloroethene	8.1	U	250	283		ug/L		113	74 - 124	6	15
cis-1,3-Dichloropropene	3.6	U	250	269		ug/L		108	74 - 124	3	15
Cyclohexane	84		250	292		ug/L		83	59 - 135	14	20
Dichlorodifluoromethane	6.8	U	250	223		ug/L		89	59 - 135	3	20
Ethylbenzene	13		250	265		ug/L		101	77 - 123	9	15
1,2-Dibromoethane	7.3	U	250	275		ug/L		110	77 - 120	1	15

Eurofins TestAmerica, Buffalo

QC Sample Results

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

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

Lab Sample ID: 480-187600-3 MSD

Client Sample ID: WG-11230275-072321-SG-003

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 590508

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
Isopropylbenzene	24		250	282		ug/L		103	77 - 122	2	20
Methyl acetate	13	U F1	500	830	F1	ug/L		166	74 - 133	6	20
Methyl tert-butyl ether	1.6	U	250	267		ug/L		107	77 - 120	2	37
Methylcyclohexane	17		250	261		ug/L		98	68 - 134	12	20
Methylene Chloride	4.4	U	250	265		ug/L		106	75 - 124	3	15
Styrene	7.3	U	250	263		ug/L		105	80 - 120	7	20
Tetrachloroethene	3.6	U	250	282		ug/L		113	74 - 122	7	20
Toluene	5.1	U	250	253		ug/L		101	80 - 122	6	15
trans-1,2-Dichloroethene	9.0	U	250	256		ug/L		102	73 - 127	4	20
trans-1,3-Dichloropropene	3.7	U	250	254		ug/L		102	80 - 120	7	15
Trichloroethene	4.6	U	250	285		ug/L		114	74 - 123	2	16
Trichlorofluoromethane	8.8	U	250	264		ug/L		106	62 - 150	13	20
Vinyl chloride	9.0	U	250	275		ug/L		110	65 - 133	4	15
Chlorobromomethane	8.7	U	250	283		ug/L		113	72 - 130	1	15
MSD MSD											
Surrogate	%Recovery		Qualifier	Limits							
Toluene-d8 (Surr)	98			80 - 120							
1,2-Dichloroethane-d4 (Surr)	104			77 - 120							
4-Bromofluorobenzene (Surr)	111			73 - 120							
Dibromofluoromethane (Surr)	107			75 - 123							

QC Association Summary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

GC/MS VOA

Analysis Batch: 590365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-187600-1	WG-11230275-072321-SG-001	Total/NA	Water	8260C	
480-187600-2	WG-11230275-072321-SG-002	Total/NA	Water	8260C	
480-187600-4	TB-11230275-072321-SG	Total/NA	Water	8260C	
MB 480-590365/8	Method Blank	Total/NA	Water	8260C	
LCS 480-590365/6	Lab Control Sample	Total/NA	Water	8260C	

Analysis Batch: 590508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-187600-3	WG-11230275-072321-SG-003	Total/NA	Water	8260C	
MB 480-590508/7	Method Blank	Total/NA	Water	8260C	
LCS 480-590508/5	Lab Control Sample	Total/NA	Water	8260C	
480-187600-3 MS	WG-11230275-072321-SG-003	Total/NA	Water	8260C	
480-187600-3 MSD	WG-11230275-072321-SG-003	Total/NA	Water	8260C	

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Client Sample ID: WG-11230275-072321-SG-001

Lab Sample ID: 480-187600-1

Date Collected: 07/23/21 10:25

Matrix: Water

Date Received: 07/23/21 10:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		40	590365	07/26/21 17:49	WJD	TAL BUF

Client Sample ID: WG-11230275-072321-SG-002

Lab Sample ID: 480-187600-2

Date Collected: 07/23/21 10:25

Matrix: Water

Date Received: 07/23/21 10:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		40	590365	07/26/21 18:12	WJD	TAL BUF

Client Sample ID: WG-11230275-072321-SG-003

Lab Sample ID: 480-187600-3

Date Collected: 07/23/21 09:10

Matrix: Water

Date Received: 07/23/21 10:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		10	590508	07/27/21 12:42	ATG	TAL BUF

Client Sample ID: TB-11230275-072321-SG

Lab Sample ID: 480-187600-4

Date Collected: 07/23/21 00:00

Matrix: Water

Date Received: 07/23/21 10:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	590365	07/26/21 18:58	WJD	TAL BUF

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Laboratory: Eurofins TestAmerica, Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
New York	NELAP	10026	04-01-22

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Method Summary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
5030C	Purge and Trap	SW846	TAL BUF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

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Sample Summary

Client: GHD Services Inc.
Project/Site: 11230275, River Road

Job ID: 480-187600-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-187600-1	WG-11230275-072321-SG-001	Water	07/23/21 10:25	07/23/21 10:55
480-187600-2	WG-11230275-072321-SG-002	Water	07/23/21 10:25	07/23/21 10:55
480-187600-3	WG-11230275-072321-SG-003	Water	07/23/21 09:10	07/23/21 10:55
480-187600-3 MS	WG-11230275-072321-SG-003	Water	07/23/21 09:10	07/23/21 10:55
480-187600-3 MSD	WG-11230275-072321-SG-003	Water	07/23/21 09:10	07/23/21 10:55
480-187600-4	TB-11230275-072321-SG	Water	07/23/21 00:00	07/23/21 10:55

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Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 480-187600-1

Login Number: 187600

List Source: Eurofins TestAmerica, Buffalo

List Number: 1

Creator: Stopa, Erik S

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	GHD
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	



Appendix C

Data Usability Report

Technical Memorandum

17 August 2021

To	John Pentilchuk	Tel	315-802-0343
Copy to	John Sweeney	Email	Linda.Waters@ghd.com
From	Linda Waters/cs/1-NF	Ref. No.	11230275
Subject	Data Usability Summary Report North Tonawanda 815 River Road Groundwater Sampling City of North Tonawanda North Tonawanda, New York July 2021		

1. Introduction

This document details the data usability and quality assessment of the analytical data resulting from the collection of groundwater samples from 815 River Road located in North Tonawanda, New York. The sample summary detailing sample identification and analytical parameters is presented in Table 1. The validated analytical results are summarized in Table 2. Samples were submitted to Eurofins TestAmerica, Buffalo, in Amherst, New York. Samples were analyzed in accordance with the methodology presented in Table 3.

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," (DER 10) May 2010.

2. Analytical Methodology and Data Validation

Evaluation of the data was based on information obtained from the finished data sheets, raw data, the chain of custody form, calibration data, blank data, and recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike (MS) samples and field QC samples. The assessment of analytical and in house data included checks for adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the document entitled: "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," USEPA 540 R 2016 002, September 2016 and will subsequently be referred to as the "Guidelines" in this Memorandum.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. The data quality assessment and validation presented in the following subsections were performed based on the sample results, supporting QA/QC and all raw data provided.

3. QA/QC Review

3.1 Deliverables

The data package was complete as defined under the requirements for Analytical Service Protocol (ASP).

4. Sample Holding Time and Preservation

The sample holding time criteria for the analysis is summarized in Table 3. The sample chain of custody document and analytical report was used to determine sample holding times. All samples were analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

5. Gas Chromatography/Mass Spectrometer (GC/MS)

Prior to volatile organic compound (VOC), GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, the method requires the analysis of the specific tuning compound bromofluorobenzene (BFB). The resulting spectra must meet the criteria cited in the method before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout VOC analysis periods. All tuning criteria were met indicating that proper optimization of the instrumentation was achieved.

6. Initial Calibration

To quantify VOCs of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range. Linearity of the calibration curve and instrument sensitivity are evaluated against the following criteria:

1. All relative response factors (RRFs) must be greater than or equal to 0.050 (greater than or equal to 0.010 for compounds that exhibit poor response).
2. The percent relative standard deviation (%RSD) values must not exceed 20.0 percent (40.0 percent for compounds that exhibit poor response) or a minimum correlation coefficient (R) and minimum coefficient of determination (R²) of 0.99 if linear and quadratic equation calibration curves are used.

The initial calibration data for VOCs were reviewed. All compounds met the above criteria for sensitivity and linearity.

All initial calibration standards were analyzed at the required frequencies. All retention time, peak resolution, and linearity criteria were satisfied as specified in the method.

7. Continuing Calibration

To ensure that instrument calibration for VOC analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

1. All RRF values must be greater than or equal to 0.050 (greater than or equal to 0.010 for compounds that exhibit poor response)
2. Percent difference (%D) values must not exceed 25.0 percent (40.0 percent for compounds that exhibit poor response)

Calibration standards were analyzed at the required frequency, and most results met the above criteria for instrument sensitivity and stability. One high %D was reported for tetrachloroethene. Associated sample results were non-detect and would not be affected by the implied high bias.

8. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blanks were non-detect, indicating that laboratory contamination was not a factor for this investigation.

9. Surrogate Spike Recoveries

In accordance with the method employed, all samples, blanks, and QC samples analyzed for volatile organics are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Each individual surrogate compound is expected to meet the laboratory control limits.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries were within the laboratory criteria.

10. Internal Standards (IS) Analyses

IS data were evaluated for all VOC sample analyses.

To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, IS compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the IS responses.

The sample IS results were evaluated against the following criteria:

1. The retention time of the IS must not vary more than ± 30 seconds from the associated calibration standard.
2. IS area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated calibration standard.

All IS recoveries and retention times met the above criteria.

11. Laboratory Control Sample Analyses

LCS are analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

12. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision.

MS/MSD analyses were performed as specified in Table 1.

The MS/MSD samples were spiked with all compounds of. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision with the exception of a high recovery for methyl acetate. All associated sample results were non-detect and would not have been affected by the indicated high bias.

13. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample and one field duplicate sample set.

13.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

13.2 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, one field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value for water samples.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

14. Analyte Reporting

The laboratory reported detected results down to the laboratory's MDL for each analyte. Positive analyte detections less than the RL but greater than the MDL were qualified as estimated (J) and non-detect results were presented as non-detect at the RL in Table 2.

15. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

Regards,

Linda Waters

Linda Waters

Data Management – Data Validator - Chemist

Table 1

Sample Collection and Analysis Summary
North Tonawanda 815 River Road Groundwater Sampling
City of North Tonawanda
North Tonawanda, New York
July 2021

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters		Comments
					VOC		
WG-11230275-072321-SG-003	MW-1	Water	07/23/2021	09:10	X		MS/MSD
WG-11230275-072321-SG-001	MW-2	Water	07/23/2021	10:25	X		
WG-11230275-072321-SG-002	MW-2	Water	07/23/2021	10:25	X		Field duplicate of WG-11230275-072321-SG-001
TB-11230275-072321-SG	-	Water	07/23/2021	-	X		Trip Blank

Notes:

VOC - Volatile Organic Compound
 "-" - Not Applicable
 MS/MSD - Matrix Spike/Matrix Spike Duplicate

Table 2

Analytical Results Summary
North Tonawanda 3815 River Road Groundwater Sampling
North Tonawanda, New York
July 2021

Location ID:	MW-1	MW-2	MW-2
Sample Name:	WG-11230275-072321-SG-003	WG-11230275-072321-SG-001	WG-11230275-072321-SG-002
Sample Date:	07/23/2021	07/23/2021	07/23/2021 Duplicate

Parameters	Unit			
Volatile Organic Compounds				
1,1,1-Trichloroethane	µg/L	10 U	40 U	40 U
1,1,1,2-Tetrachloroethane	µg/L	10 U	40 U	40 U
1,1,2-Trichloroethane	µg/L	10 U	40 U	40 U
1,1-Dichloroethane	µg/L	10 U	40 U	40 U
1,1-Dichloroethene	µg/L	10 U	40 U	40 U
1,2,3-Trichlorobenzene	µg/L	10 U	40 U	40 U
1,2,4-Trichlorobenzene	µg/L	10 U	40 U	40 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	10 U	40 U	40 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	10 U	40 U	40 U
1,2-Dichlorobenzene	µg/L	10 U	40 U	40 U
1,2-Dichloroethane	µg/L	10 U	40 U	40 U
1,2-Dichloropropane	µg/L	10 U	40 U	40 U
1,3-Dichlorobenzene	µg/L	10 U	40 U	40 U
1,4-Dichlorobenzene	µg/L	10 U	40 U	40 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	100 U	400 U	400 U
2-Hexanone	µg/L	50 U	200 U	200 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	50 U	200 U	200 U
Acetone	µg/L	100 U	400 U	400 U
Benzene	µg/L	10 U	140	170
Bromodichloromethane	µg/L	10 U	40 U	40 U
Bromoform	µg/L	10 U	40 U	40 U
Bromomethane (Methyl bromide)	µg/L	10 U	40 U	40 U
Carbon disulfide	µg/L	10 U	40 U	40 U
Carbon tetrachloride	µg/L	10 U	40 U	40 U
Chlorobenzene	µg/L	10 U	40 U	40 U
Chlorobromomethane	µg/L	10 U	40 U	40 U
Chloroethane	µg/L	10 U	40 U	40 U
Chloroform (Trichloromethane)	µg/L	10 U	40 U	40 U

Analytical Results Summary
North Tonawanda 3815 River Road Groundwater Sampling
North Tonawanda, New York
July 2021

Location ID:	MW-1	MW-2	MW-2
Sample Name:	WG-11230275-072321-SG-003	WG-11230275-072321-SG-001	WG-11230275-072321-SG-002
Sample Date:	07/23/2021	07/23/2021	07/23/2021 Duplicate

Parameters	Unit			
Volatile Organic Compounds				
Chloromethane (Methyl chloride)	µg/L	10 U	40 U	40 U
cis-1,2-Dichloroethene	µg/L	10 U	40 U	40 U
cis-1,3-Dichloropropene	µg/L	10 U	40 U	40 U
Cyclohexane	µg/L	84	240	320
Dibromochloromethane	µg/L	10 U	40 U	40 U
Dichlorodifluoromethane (CFC-12)	µg/L	10 U	40 U	40 U
Ethylbenzene	µg/L	13	2100	2400
Isopropyl benzene	µg/L	24	350	390
Methyl acetate	µg/L	25 U	100 U	100 U
Methyl cyclohexane	µg/L	17	110	130
Methyl tert butyl ether (MTBE)	µg/L	10 U	40 U	40 U
Methylene chloride	µg/L	10 U	40 U	40 U
Styrene	µg/L	10 U	40 U	40 U
Tetrachloroethene	µg/L	10 U	40 U	40 U
Toluene	µg/L	10 U	29 J	34 J
trans-1,2-Dichloroethene	µg/L	10 U	40 U	40 U
trans-1,3-Dichloropropene	µg/L	10 U	40 U	40 U
Trichloroethene	µg/L	10 U	40 U	40 U
Trichlorofluoromethane (CFC-11)	µg/L	10 U	40 U	40 U
Trifluorotrchloroethane (CFC-113)	µg/L	10 U	40 U	40 U
Vinyl chloride	µg/L	10 U	40 U	40 U
Xylenes (total)	µg/L	20 U	310	350

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 3

Analytical Methods
Noth Tonawanda 815 River Road Groundwater Sampling
City of North Tonawanda
North Tonawanda, New York
July 2021

Parameter	Method	Matrix	Preservation	Collection to Analysis (Days)
Volatile Organic Compounds (VOCs)	SW-846 8260C	water	pH < 2 and Iced, 0-6° C	14

Notes:

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Appendix D

IC EC Certification



Enclosure 2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form



Site No.	B00178	Site Details	Box 1
Site Name 815 River Road Investigation			
Site Address: 815 River Road		Zip Code: 14120	
City/Town: North Tonawanda			
County: Niagara			
Site Acreage: 0.857			
Reporting Period: February 01, 2019 ²⁰²¹ to February 01, 2020 ²⁰²²			
			YES NO
1. Is the information above correct?			<input type="checkbox"/> <input checked="" type="checkbox"/>
If NO, include handwritten above or on a separate sheet.			
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?			<input type="checkbox"/> <input checked="" type="checkbox"/>
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?			<input type="checkbox"/> <input checked="" type="checkbox"/>
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?			<input type="checkbox"/> <input checked="" type="checkbox"/>
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.			
5. Is the site currently undergoing development?			<input type="checkbox"/> <input checked="" type="checkbox"/>
			Box 2
			YES NO
6. Is the current site use consistent with the use(s) listed below? Commercial and Industrial			<input checked="" type="checkbox"/> <input type="checkbox"/>
7. Are all ICs/ECs in place and functioning as designed?			<input checked="" type="checkbox"/> <input type="checkbox"/>
IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.			
A Corrective Measures Work Plan must be submitted along with this form to address these issues.			
_____ Signature of Owner, Remedial Party or Designated Representative			_____ Date

Description of Institutional Controls

Parcel

181.12-1-19

Owner

Metzger Removal, Inc.

Institutional Control

Ground Water Use Restriction
Site Management Plan
Soil Management Plan

Monitoring Plan
Landuse Restriction
IC/EC Plan

An Environmental Easement was filed with the Niagara County Clerk's Office on November 17, 2014. The Controlled Property may be used for commercial and industrial use as long as the following long-term institutional controls are employed: (1) restrict the use of site groundwater as a source of potable or process water without necessary water quality treatment as determined by the NYSDOH or Niagara County Department of Health; (2) all future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the Site Management Plan; and (3) monitoring to assess the performance and effectiveness of the remedy must be conducted as defined in the Site management Plan.

Description of Engineering Controls

Parcel

181.12-1-19

Engineering Control

Monitoring Wells

None required by the December 2008 Record of Decision other than tangible monitoring wells.

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and complete.

YES NO

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

(a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

(b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

(c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

(d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

(e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES NO

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Chelsea J. Spach
Signature of Owner, Remedial Party or Designated Representative

2/28/22
Date

IC CERTIFICATIONS
SITE NO. B00178

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1, 2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I CHELSEA L. SPARK at 216 PAYNE AVENUE, NORTH TONAWANDA, NY 14120
print name print business address

am certifying as CITY ENGINEER (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.


Signature of Owner, Remedial Party, or Designated Representative
Rendering Certification

2/28/22
Date

IC/EC CERTIFICATIONS

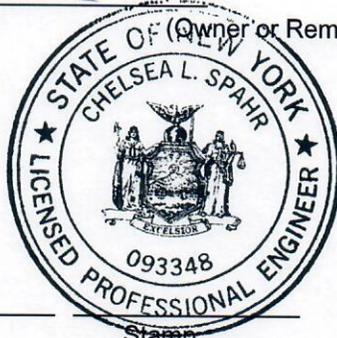
Box 7

Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I CHELSEA L. SPAHR at 216 PAYNE AVE., NORTH TONAWANDA, NY 14120
print name print business address

am certifying as a for the CITY ENGINEER (Owner or Remedial Party)



Chelsea L. Spahr
Signature of, for the Owner or Remedial Party,
Rendering Certification

Stamp
(Required for PE)

2/28/22
Date



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→ **The Power of Commitment**