Operation and Monitoring Report

June 2014 to May 2015
Gratwick Riverside Park Site
North Tonawanda, New York

City of North Tonawanda

651 Colby Drive Waterloo Ontario N2V 1C2
007987 | Report No 43 | September 21 2015

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1. Introduction

This report is the 13th annual Operation and Monitoring Report (O&M Report) for the remedial actions constructed at the Gratwick-Riverside Park Site (Site) located in North Tonawanda, New York. This report covers the period from June 2014 to May 2015 and was prepared pursuant to Section 7.0 of the report entitled "Operation and Maintenance Manual" (O&M Manual) dated March 2002 (revised January 2004, May 2009 and June 2014). It is noted that New York State Department of Environmental Conservation (NYSDEC) approval for the O&M Manual was given on April 20, 2005. All O&M activities have been performed in accordance with the methods and frequencies specified in the O&M Manual and as modified in previous annual reports and approved by NYSDEC. In accordance with the approved monitoring changes, the groundwater is monitored annually in five wells and an additional seven wells are monitored once every two years as of and including May 2013. The surface water quality of the Niagara River adjacent to the Site is not impacted by the Site and is no longer monitored. The collected groundwater that is discharged from the Site is monitored semi-annually in accordance with the City of North Tonawanda Wastewater Discharge Permit (effective March 1, 2013). A copy of the permit is included in Appendix A.

2. Groundwater Withdrawal System (GWS)

Full-time operation of the Groundwater Withdrawal System (GWS) at the Site started on May 4, 2001. The objectives of the GWS are to:

i) Achieve and maintain an inward gradient from the Niagara River toward the GWS.

ii) Achieve and maintain an upward gradient from the fill alluvium layer beneath the GWS.

In order to determine whether the objectives are being met, hydraulic and chemical monitoring programs have been developed. These programs include Site groundwater and GWS effluent monitoring. The wells, manholes, wet wells, and storm sewer outfalls that comprise the monitoring network are shown on Figure 2.1. The monitoring programs are described in the following subsections.

2.1 Hydraulic Monitoring

Hydraulic monitoring consists of the collection of water levels in monitoring wells and manholes, and River water levels at the storm sewer outfalls. These data are then used to determine the vertical and horizontal gradients for the groundwater.

The water levels in four GWS manholes and in the River were monitored to confirm that an inward gradient exists. The water levels in five GWS manholes and in four monitoring wells installed near the GWS alignment in the materials directly overlying the confining unit were monitored to confirm that an upward gradient exists. The specific manholes and monitoring wells used to determine the horizontal and vertical gradients are listed in Table 2.1.

Groundwater elevations are measured on a monthly basis. The measured water levels for the time period June 2011 through May 2015 are provided in Table 2.2. The horizontal and vertical gradients for this reporting period are provided in Tables 2.3 and 2.4, respectively. The water levels and

horizontal and vertical gradients to May 2011 were previously provided and thus are not provided in this report.

The results for the horizontal gradient evaluation show that:

i) Inward horizontal gradients were achieved by May 11, 2001, within one week of the start of pumping the GWS.

ii) The inward gradients were maintained for the remainder of the 14 years except for a few short intervals in isolated areas. There were two exceptions in the June 2014 through May 2015 reporting period (i.e., December 2014 through April 2015 in the area of River North/MH2 and March and April 2015 in the area of River Middle/MH8).

The distance which groundwater may have migrated into the barrier wall during the period of outward gradient can be calculated using the equation:

Distance = velocity x time

The monitoring pair location of River North and MH2 has the longest period of outward gradients (i.e., outward gradients were measured from December 30, 2014 through April 23, 2015). Assuming the gradient changed direction at the mid-period between the November 25 and December 30, 2014 monitoring dates and between the April 23 and May 29, 2015 monitoring dates, an outward gradient existed for 150 days.

Groundwater velocity into the barrier wall was calculated using:

Velocity = Hydraulic conductivity (K) x Gradient/ Porosity

The design hydraulic conductivity for the barrier wall was 1E-07 cm/s (2.84E-04 ft/day). Testing performed during construction of the barrier wall showed all test results had lower K than 1E-07 cm/s. Thus, the design K was used for the calculation.

Gradient is calculated by the difference in water levels between the monitoring pair locations. The measured levels on December 30, 2014 had the greatest difference in water levels (i.e., 567.27 ft amsl in MH2 and 564.20 ft amsl in River North). Assuming the entire 3.06 foot difference occurs as head loss through the 30-inch thick barrier wall, results in a gradient of 1.224 ft/ft.

The barrier wall was constructed using fine-grained soil and clay. Clay-based soils have porosities ranging from 0.37 to 0.84 (Peck, Hanson and Thornburn, "Foundation Engineering, 2nd Edition", John Wiley & Sons, Inc.). The lower the porosity, the farther migration into the barrier wall occurs. A conservative value of 0.25 was used for calculation.

Using the maximum head loss for the entire period of outward gradient combined with using the design K, which is greater than the constructed K of the barrier wall, and a porosity of 0.25 results in a conservative (greater) distance of migration into the barrier wall.

The calculated velocity is:

V = (1.224 x 2.83E-04)/ 0.25 = 1.39E-03 ft/day (0.5 ft/yr)

and the distance which groundwater migrated into the barrier wall is:

D = 1.39E-03 x 150 = 0.21 feet

Another way to look at this is that it would take approximately 5 years for the groundwater to migrate through the barrier wall at this very conservative velocity.

Thus, short periods of outward gradient do not adversely affect the effectiveness of the remedy because:

i) The gradients were outward for only short periods of time.

ii) The outward gradients occurred over only a portion of the barrier wall.

iii) The 36-inch barrier wall is six inches thicker than the design thickness thereby providing extra protection.

iv) Any outward migration of Site groundwater into the barrier wall during the short periods of outward gradient is more than offset by the inward migration of river water into the barrier wall during the long periods of inward gradient.

v) The groundwater level on the upgradient side of the barrier wall was never higher than the elevation of the top pf the barrier wall (i.e., 568.5 ft amsl). Thus, no overtopping occurred.

The results for the vertical gradient evaluation showed that the vertical gradients during the June 2014 through May 2015 reporting period were continually upward for all four monitoring locations with the following exceptions (i.e., August to December 2014 in the area of MH8/MW-7, December 2014 through February 2015 in the area of MH3/MW-6, and January 2015 in the area of MH14/MW-9).

Short periods of downward gradient do not adversely affect the effectiveness of the remedy because:

i) The gradients were downward for only short periods of time.

ii) The downward gradients occurred along only a portion of the GWS.

iii) The barrier wall and thick alluvium clay till underlying the fill which the barrier wall was keyed into prevented the migration of impacted groundwater from the Site.

iv) Any downward migration of the Site's groundwater into the underlying fill alluvium layer during the short periods of downward migration is more than offset by upward migration during the long periods of upward gradient.

2.2 Groundwater Quality Monitoring

Groundwater quality monitoring consists of the collection of water samples from on-Site overburden monitoring wells (OGC-1 through OGC-8 and MW-6 through MW-9) and the analysis of these samples to determine the concentrations of chemicals in the groundwater. The purpose of the groundwater quality monitoring program is to monitor the anticipated improvement in the quality of the overburden groundwater:

i) Between the barrier wall and the River (OGC-1 through OGC-4)

ii) In the fill/alluvium beneath the GWS (MW-6 through MW-9)

The MWs are located on the inside of the barrier wall and the OGCs are located between the barrier wall and the river.

Groundwater quality monitoring locations are presented on Figure 2.1 and the analytical parameters and frequency are listed in Table 2.5.

Groundwater sampling was performed on an annual basis between May 2004 and May 2008. As approved in the NYSDEC letter dated February 23, 2009 the sampling frequency for May 2009 through May 2012 was:

Annual	Once Every 2 Years (2010 and 2012)
MW 8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-4	OGC-2
OGC-6	OGC-5
OGC-7	
OGC-8	

As approved by the NYSDEC on March 27, 2013, the sampling frequency for May 2013 through May 2017 will be:

Annual	Once Every 2 Years (2014 and 2016)
MW-8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-6	OGC-2
OGC-7	OGC -4
	OGC-5
	OGC-8

2.2.1 Sample Results

A summary of compounds detected in the groundwater samples for this reporting period is provided in Table 2.6 and pH levels are provided in Table 2.7.

To evaluate the trends in the groundwater chemistry and evaluate the appropriate frequency of future sampling, the VOCs and SVOCs were summed and plotted on Figures 2.2 through 2.13 for each of the 12 monitoring wells included in the program. It is believed that the sum of the VOCs (i.e., TVOCs) and SVOCs (i.e., TSVOCs) best represent the trends in the groundwater chemistry.

Review of the TVOC and TSVOC concentrations for the five wells sampled in 2015 show the following trends:

i) TVOCs:

- Decreasing concentrations in four of the five wells (MW-8, OGC-3, OGC-6 and OGC-7)
- Relatively constant concentrations with random fluctuations in MW-9

ii) TSVOCs:

- Decreasing concentrations in two of the five wells (OGC-3 and OGC-6)
- Relatively constant concentrations with random fluctuations in the remaining three wells (MW-8, MW-9 and OGC-7)

All the wells had only low level TVOC concentrations in this reporting period, except for MW-8 (46 micrograms per liter [μg/L]) and OGC-6 (290 μg/L). With regard to TSVOC concentrations, two wells had higher concentrations, MW-8 (78 μg/L) and MW-9 (290 μg/L).

In summary, the number of wells with decreasing or constant but fluctuating low level concentrations and considering that no wells had increasing concentrations, shows that the groundwater is being remediated.

Additional description of the TVOC and TSVOC concentrations is provided in the following paragraphs. The descriptions of the wells not sampled in 2015 are the same as those provided in the June 2013 to May 2014 O&M Report.

Monitoring Wells On-Site - Inside Barrier Wall

The TVOC concentrations for MW-6 shown on Figure 2.2 have been less than 5 μg/L since May 2007. The TSVOC concentrations were low level (i.e., <5 μg/L) since May 2004 until May 2010 when they increased slightly to 20 μg/L. In May 2012 the TSVOC concentration had reduced to 10 μg/L and remained at 10 μg/L for the May 2014 sample.

The TVOC and TSVOC concentrations for MW-7 on Figure 2.3 show that both TVOC and TSVOC have remained low level. TVOC concentrations ranged from non-detect to 4 μg/L since May 2006. TSVOC concentrations ranged from non-detect to 1 μg/L since May 2004.

The TVOC concentrations for MW-8 on Figure 2.4 show that the TVOC concentrations have decreased from 140 μg/L in May 2009 to 46 μg/L in May 2015. The TSVOC concentrations since May 2011 have generally been in the 70s μg/L range (May 2015 = 78 μg/L).

The TVOC concentrations for MW-9 on Figure 2.5 show that the TVOC concentrations ranged between 9 and 30 μg/L for the entire record period. The TSVOC concentrations have fluctuated between 120 to 440 μg/L between August 2002 and May 2015.

All MWs are located on the inside of the barrier wall and a net inward gradient has been consistently maintained in the vicinity of these wells. Thus, the TVOCs and TSVOCs are not migrating to the Niagara River.

Monitoring Wells between Barrier Wall and River

The TVOC concentrations for OGC-1 on Figure 2.6 show that the concentrations since November 2003 ranged between non-detect and 4 μg/L. The TSVOC concentrations since November 2003 have fluctuated between non-detect and 3 μg/L.

The TVOC concentrations for OGC-2 on Figure 2.7 have been non-detect since May 2006. The TSVOC concentrations were all non-detect since monitoring of the remedy started except for the May 2014 sample which had a TSVOC concentration of 0.8 μg/L.

The TVOC concentrations for OGC-3 shown on Figure 2.8 have been less than 11 μg/L since May 2009 with the May 2015 sample result being non-detect. The TSVOC concentrations have decreased from 300 μg/L in November 2003 to 79 μg/L in May 2015.

The TVOC concentrations for OGC-4 shown on Figure 2.9 fluctuated between non-detect and 6 μg/L for the time period from November 2002 to May 2010 and have been non-detect since May 2010. The TSVOC concentrations have fluctuated widely but have continually decreased since

May 2004 with a concentration of 1.6 μg/L in the May 2014 sample. The single compound responsible for the higher historic concentrations was phenol.

The TVOC concentrations for OGC-5 shown on Figure 2.10, ranged from non-detect to 5 μg/L since November 2003 (except for May 2008 at 5.8 μg/L). The TSVOC concentrations ranged from non-detect to 2 μg/L since February 2003.

The TVOC concentrations for OGC-6 shown on Figure 2.11 have continually decreased from 1,650 μg/L in the May 2013 sample to 290 μg/L in the May 2015 sample. The TSVOC concentrations decreased from 157 μg/L in May 2008 to 7 μg/L in the May 2015 sample.

The TVOC concentrations for OGC-7 shown on Figure 2.12 have decreased from 160 μg/L in November 2003 and were 9.3 μg/L in the May 2015 sample. The TSVOC concentrations have been less than 2 μg/L since November 2001 (May 2015 result was non-detect).

The TVOC concentrations for OGC-8 shown on Figure 2.13 decreased from 460 μg/L in May 2001 to 29 μg/L in May 2004 and have ranged from non-detect to 30 μg/L since that time. The TSVOC concentrations decreased from 139 μg/L in August 2001 to 25 μg/L in May 2003 and have ranged from non-detect to 11 μg/L since that time.

The QA/QC review/ Data Usability Summary of the May 2015 groundwater results are included in Appendix C. The raw laboratory data is provided on a CD included in Appendix D.

2.3 Effluent Monitoring Program

Groundwater from the GWS is discharged to the POTW without the need for pretreatment. The monitoring performed during the construction phase of the remedy clearly showed that the minimal chemical presence in the groundwater collected in the GWS is easily treated at the POTW and therefore no on-Site pretreatment is necessary. The effluent samples are collected at the monitoring station (meter building), which is located at the south end of the Site as shown on Figure 2.1. The analytical parameters monitored since 2007 are listed in Table 2.8.

2.3.1 Sample Results

Effluent samples are collected semi-annually and consist of a 24-hour composite sample collected for SVOCs, metals, and wet chemistry parameters. Three grab samples are also collected for VOCs at 8-hour intervals and the measured concentrations are averaged to give a 24-hour concentration.

QA/QC reviews of the discharge results to May 2014 have already been submitted to the NYSDEC. Thus, these reviews are not being resubmitted with this O&M Report. The QA/QC reviews of the discharge results from October 2014 and April 2015 are provided in Appendix C.

The effluent sample results for this reporting period are provided in Table 2.9. To assist in evaluating the chemical concentration trends in the effluent discharge from the GWS, the measured concentrations for the following parameters are plotted: TVOCs, TSVOCs, pH, total suspended solids (TSS), and biochemical oxygen demand (BOD) (see Figures 2.14 through 2.17). It is believed that these parameters are representative of the trends in the chemistry of the water discharged to the POTW and, as such, can also be used to determine an appropriate monitoring frequency for the effluent.

As shown on Figure 2.14, the TVOCs generally peak in the spring and then decline reaching a trough in the fall. This pattern may be attributable to additional flushing during the spring snow melt. The long-term trend of the TVOC concentrations shows an overall decrease with time from a peak concentration of 760 μg/L in April 2002 to a concentration of 5 μg/L in April 2015. The effluent TSVOC results on Figure 2.14 show no apparent seasonal pattern. The TSVOC concentrations decreased with time until March 2011 (non-detect) and since then have increased to 89 μg/L in the April 2015 sample.

The pH levels are presented on Figure 2.15. As shown on Figure 2.15, the pH levels range between 7.3 and 11.6. An apparent trend in the pH levels is higher pH levels in the winter/spring and lower pH levels in the summer/fall.

The TSS concentrations presented on Figure 2.16 show higher concentrations occurring in the early spring and late summer/fall with elevated concentrations (maximum of 278 milligrams per liter [mg/L]) in the spring of 2005. Because TSS may be related to the discharge flow rate, the monthly discharge volume (see Table 2.11) is plotted on Figure 2.18. Comparison of the results presented on these two figures shows an apparent correlation between higher flows and greater TSS concentrations except for the 2005 spring results.

The BOD concentrations are presented on Figure 2.17. As shown on Figure 2.17, BOD concentrations have randomly ranged from 4 to 29 mg/L since May 2002 with a one-time peak of 45 μg/L in September 2012. The BOD concentrations were compared with the discharge volume but showed no apparent correlation.

In summary, the trends and low level TVOC and TSVOC concentrations described above support the semi-annual sampling frequency in the current City of North Tonawanda Industrial Wastewater Discharge Permit.

2.4 GWS Operations

The volume of water pumped on a monthly basis from the Site to the City POTW for treatment is presented in Table 2.10 and plotted on Figure 2.18. The monthly volumes show that during the time period of initial dewatering of the Site (i.e., May and June 2001) the monthly volumes ranged from 2,300,000 to 2,900,000 gallons. For the time period from June 2007 to May 2015, not including the months when the flow meter malfunctioned, the monthly volumes ranged from 23,800 to 2,661,000 gallons except for March 2009 which had a volume of 4,239,000 gallons.

The total measured volume of water discharged from the Site for the time period from May 2001 to May 2014 was 109,389,500 gallons with 11,411,500 gallons (26 gallons per minute [gpm] average) pumped during the 10 months from August 2014 through May 2015. The discharge volumes for June and July 2014 were not included in the calculations due to a meter malfunction.

Section 5.0 of the O&M Manual describes the procedures to be followed in case pumping of the GWS needs to be stopped to prevent the discharge of untreated water from the Site by the City POTW (i.e., wet weather shutdown). Wet weather shutdowns occurred in the following time periods from June 2014 to May 2015:

Time Period
July 30, 2014
August 12, 2014

The treatment of the Site groundwater by the City POTW did not require any modifications to the standard operations of the City POTW and did not cause any operational upsets of the City POTW from June 2014 to May 2015.

2.5 GWS Maintenance

This section describes the GWS maintenance activities performed during the June 2014 through May 2015 time period. A listing of the maintenance activities are provided in Table 2.11.

The pump for Pump Station (PS) #2 (MH-9) was observed to be drawing high amperage. The pump was cleaned on July 22, 2014.

The pump for PS #3 (MH-15) was observed not to be operating on September 30, 2014. Three new pumps were ordered on February 15, 2015 (one for each of Pumps #2 and #3 plus a spare). The pumps were received on March 11 and one was installed on March 19. Problems with seating the pump outlet to the discharge force main were being addressed as of May 31, 2015.

The pump for PS #1 (MH-3) was observed not to be operating on December 28, 2014. Two new pumps (one spare) were ordered on January 15, 2015 and one was installed on February 20, 2015. Seating issues between the pump outlet and the discharge force main were resolved on March 2, 2015, on which date the pump became operational.

The pump for PS #2 (MH-9) was observed not to be operating on January 28, 2015. The new pump ordered on February 15 was installed and became operational on March 17, 2015.

A letter was received from the NYSDEC on March 12, 2015 requesting a Corrective Measures Work Plan (CMWP) to address the operational issues of the Groundwater Withdrawal System (GWS). The CMWP was submitted on April 9, 2015. Copies of both documents are provided in Appendix E. The CMWP included a description of the pump replacements summarized above and stated that the GWS had adequately protected the environment even during the time period when pumping capability of the GWS was decreased. Additional support that the environment was protected is provided in Section 2.1 of this O&M Report.

The monthly monitoring of the sediment in the GWS manholes indicated thicknesses typically ranging from 0.0 to 0.1 feet, with a one-time maximum thickness of 0.45 feet. In accord with the addendum to the O&M Manual, provided as Appendix F in the June 2013 to May 2014 O&M Report, sediments are to be removed every five years unless the sediment thickness is deemed sufficient to adversely affect the operation of the GWS. The measured minimal thicknesses were deemed not sufficient to adversely impact the operation of the GWS. Thus, no sediment removal occurred in the June 2014 to May 2015 period.

3. Site Inspections

Site inspections were performed on a monthly basis. Copies of the Inspection Logs for the time period to May 2014 were previously submitted and thus are not being resubmitted with this O&M Report. The Monthly Inspection Logs for June 2014 through May 2015 are included in Appendix B. In summary, the June 2014 through May 2015 inspections identified:

i) Higher water levels in the southern portion of the GWS from October 2014 through May 2015 due to the failure of the GWS pump in PS #3 (MH-15). Gradients remained inward during this entire time period. Activities related to PS #3 are described in Section 2.5.

ii) Higher water levels in the northern portion of the GWS from December 2014 through February 2015 due to failure of the GWS pump in PS #1 (MH-3). Activities related to PS #1 are described in section 2.5.

iii) Higher water levels in the middle portion of the GWS in January and February 2015 due to failure of the GWS pump in PS #2 (MH-9). Activities related to PS #2 are described in Section 2.5.

iv) Soil erosion with wire mesh exposed along portions of the shoreline from June 2014 through May 2015.

v) Drift consisting of various sizes of dead trees partially blocked the River North outlet in July, September and December 2014 and in January, April and May 2015. The River Middle outlet was partially blocked in June 2014. The drift was removed as needed.

The schedule for repair of the erosion is to be determined by the City of North Tonawanda.

4. Conclusions/Recommendations

4.1 Operation and Maintenance

The constructed remedy is achieving the remedial action objectives.

4.2 Monitoring

The groundwater TVOC and TSVOC concentrations are either decreasing or are relatively consistent with time in four of the five wells sampled in May 2015.

The groundwater sample collection frequency for the next 5-year period (i.e., May 2013 through May 2017) will be:

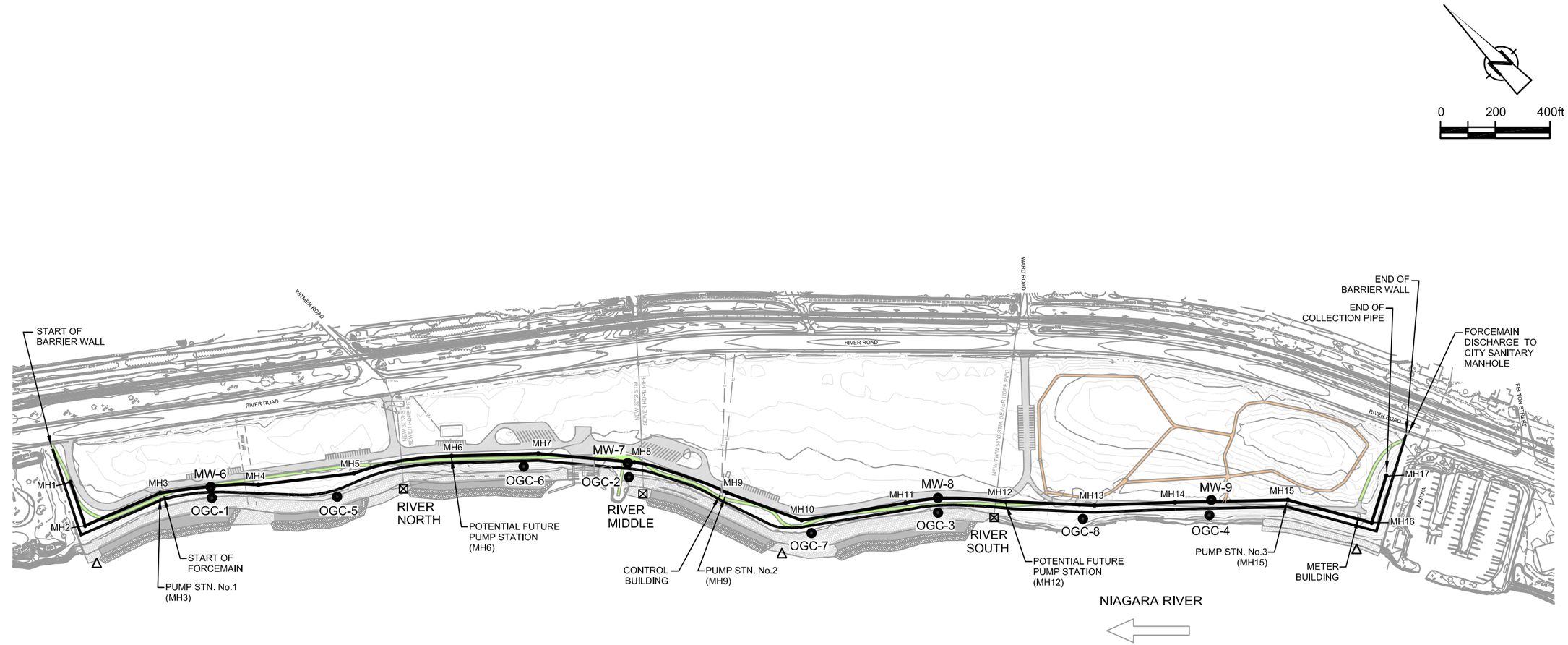
Annual	Once Every 2 Years (2014 and 2016)
MW 8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-6	OGC-2
OGC-7	OGC-4
	OGC-5
	OGC-8

Pursuant to the discharge permit effective March 1, 2013, semi-annual monitoring was performed during the time period June 2014 through May 2015. The trends in the effluent from the GWS to the POTW support the continuation of the sampling frequency at semi-annual. Flow monitoring will continue to be performed monthly as a check on the operation of the GWS.

Monthly monitoring of the sediment thickness in the GWS manholes will continue. The sediment is to be removed once every five years, if necessary. The sediment will be removed during low-flow conditions which typically occur in late summer.

4.3 Notifications to City of North Tonawanda

Notifications of anomalies in the visual inspections, discharge volumes and/or groundwater levels were and will continue to be provided to the City of North Tonawanda Public Works Engineering and Wastewater Treatment Department within a few days of measurement of the anomaly to allow for timely maintenance.



LEGEND

- BARRIER WALL
- MH11 — GROUNDWATER COLLECTION SYSTEM
- ● OGC-1 MW-1 — MONITORING WELL LOCATION
- ⊠ RIVER SOUTH — SURFACE WATER LEVEL MONITORING LOCATION
- △ — SURFACE WATER CHEMICAL MONITORING LOCATION (NO SAMPLING AFTER APRIL 2008)

figure 2.1

MONITORING NETWORK
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

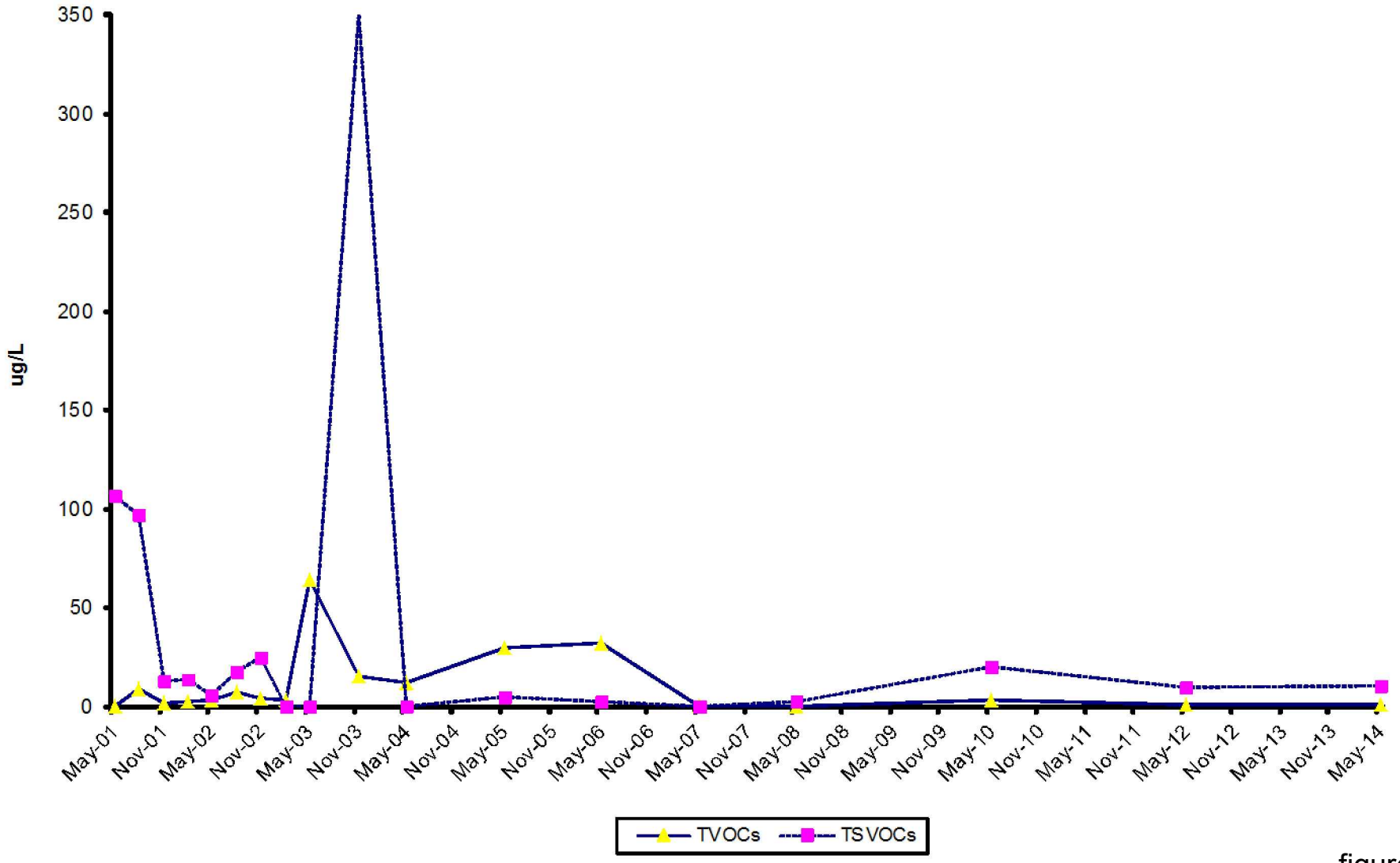


figure 2.2

MW-6 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

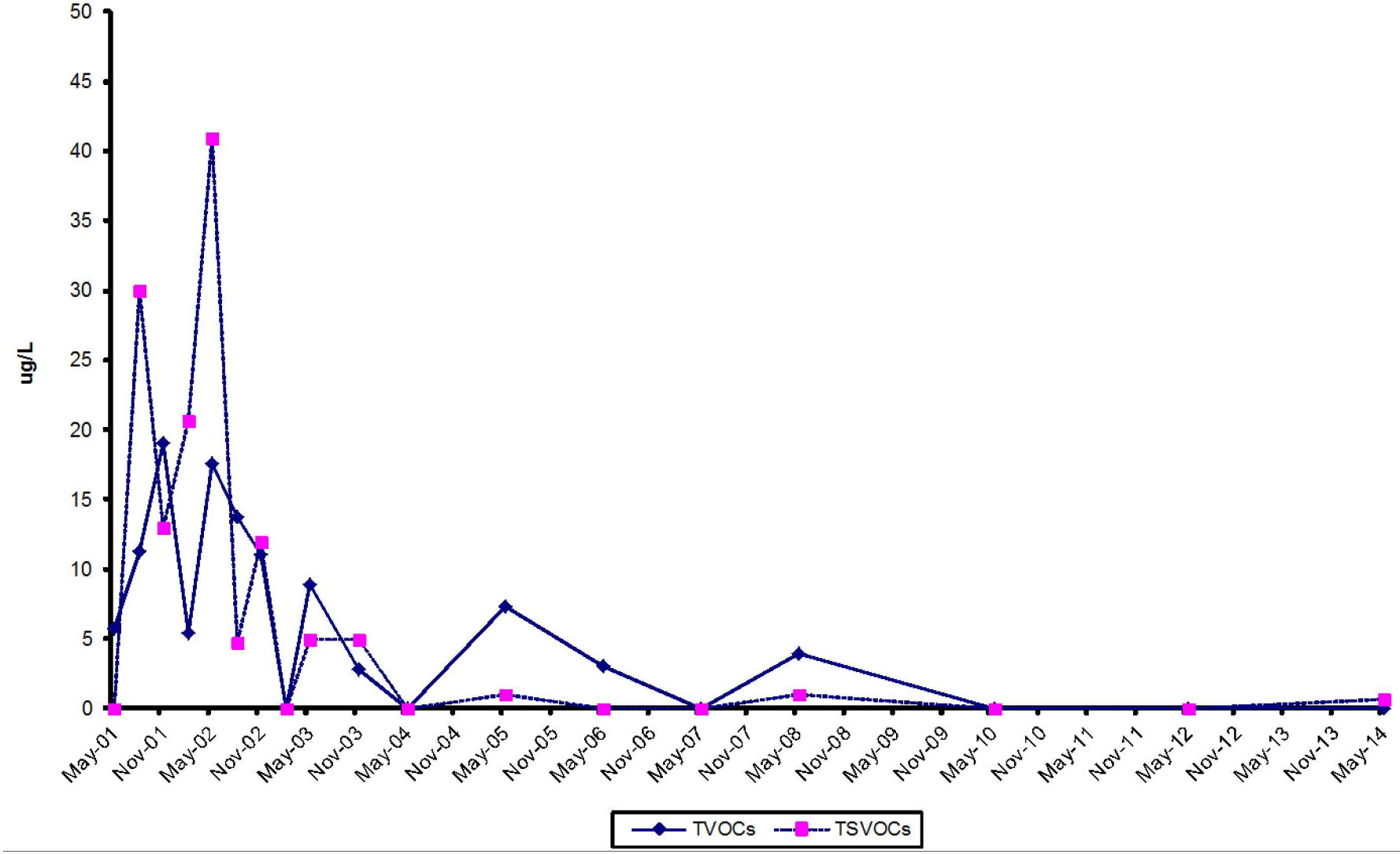


figure 2.3

MW-7 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

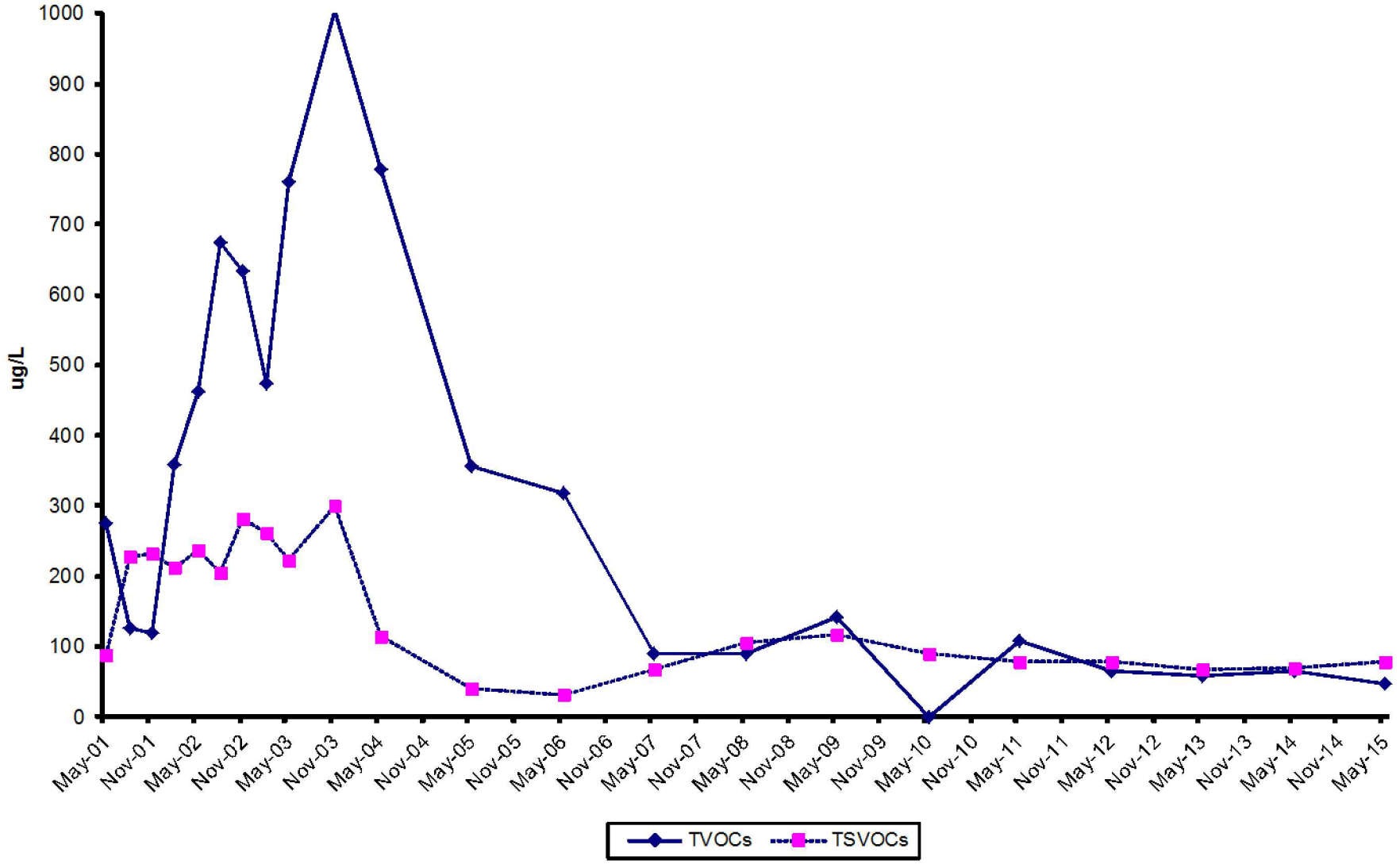


figure 2.4

MW-8 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

07987-00(043)GN-WA004 JUL 2/2015

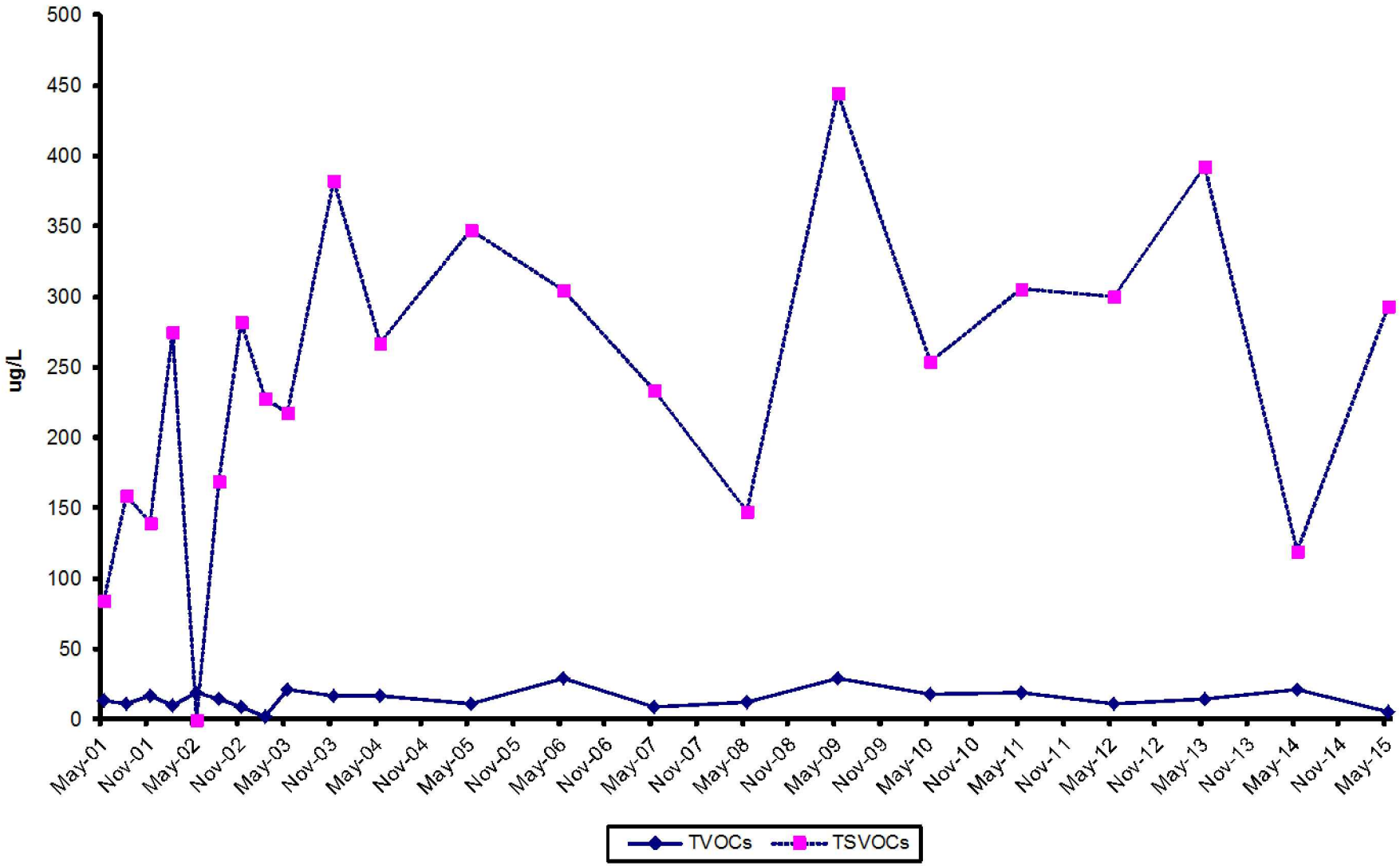


figure 2.5

MW-9 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

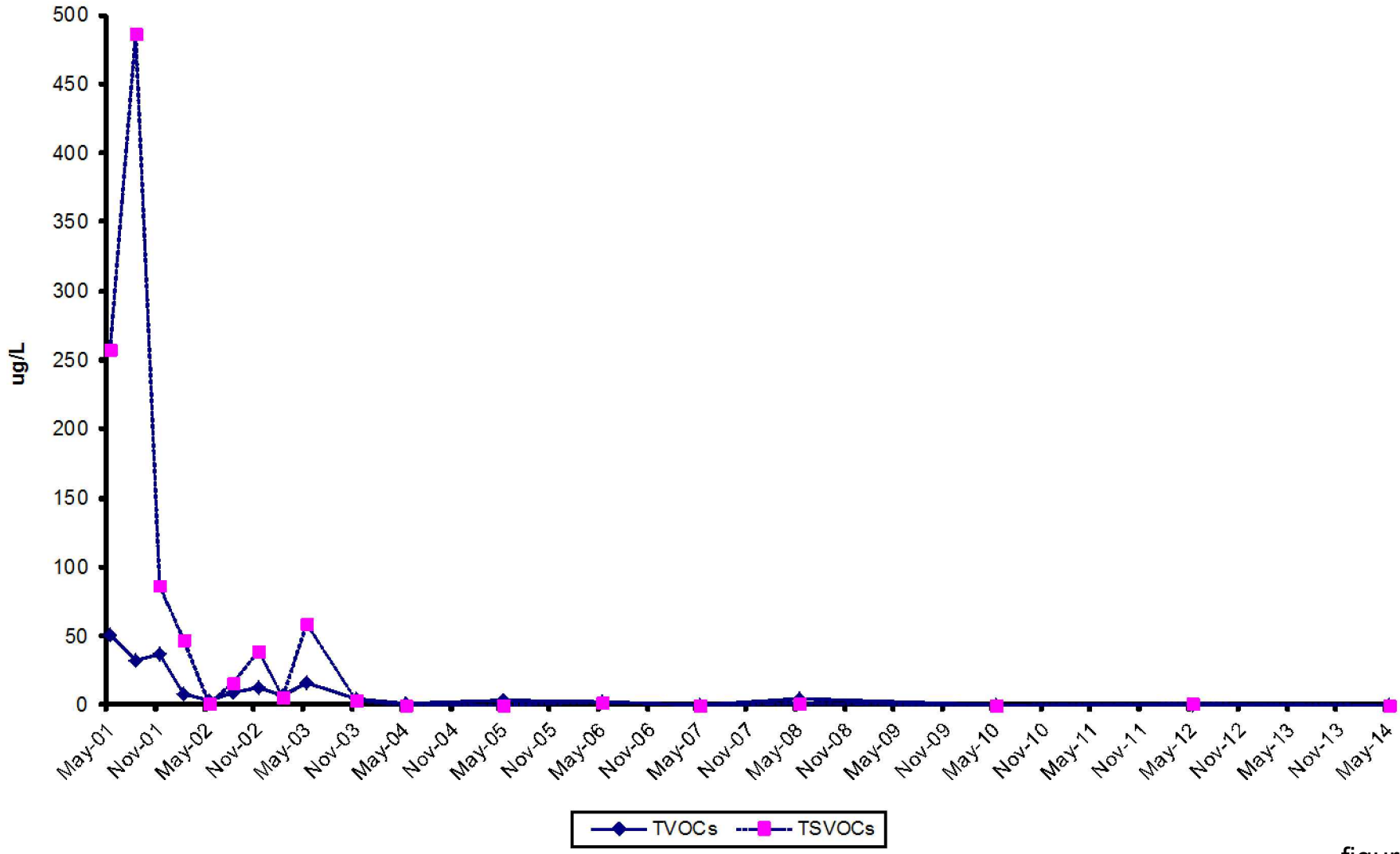


figure 2.6

OGC-1 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

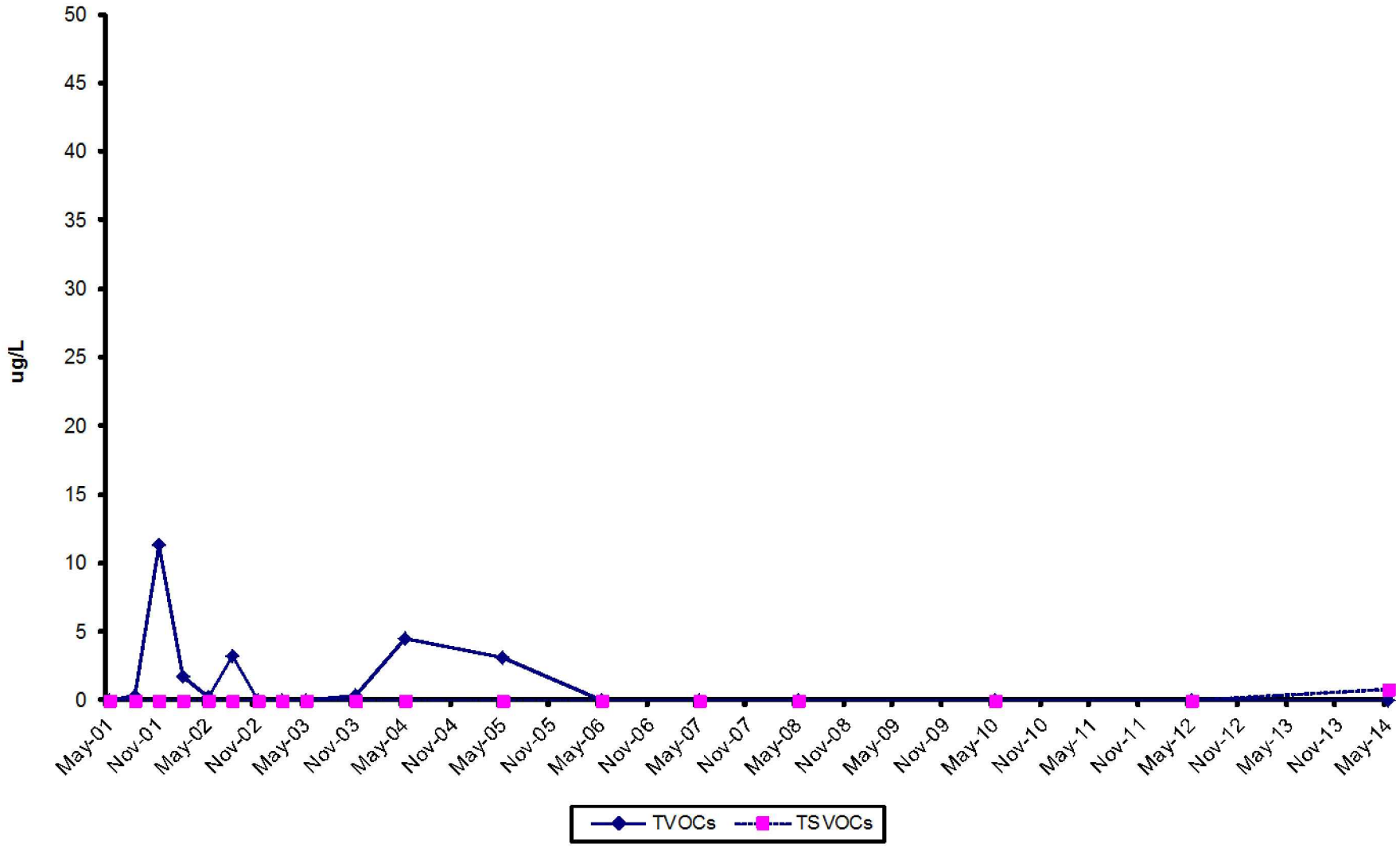


figure 2.7

OGC-2 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

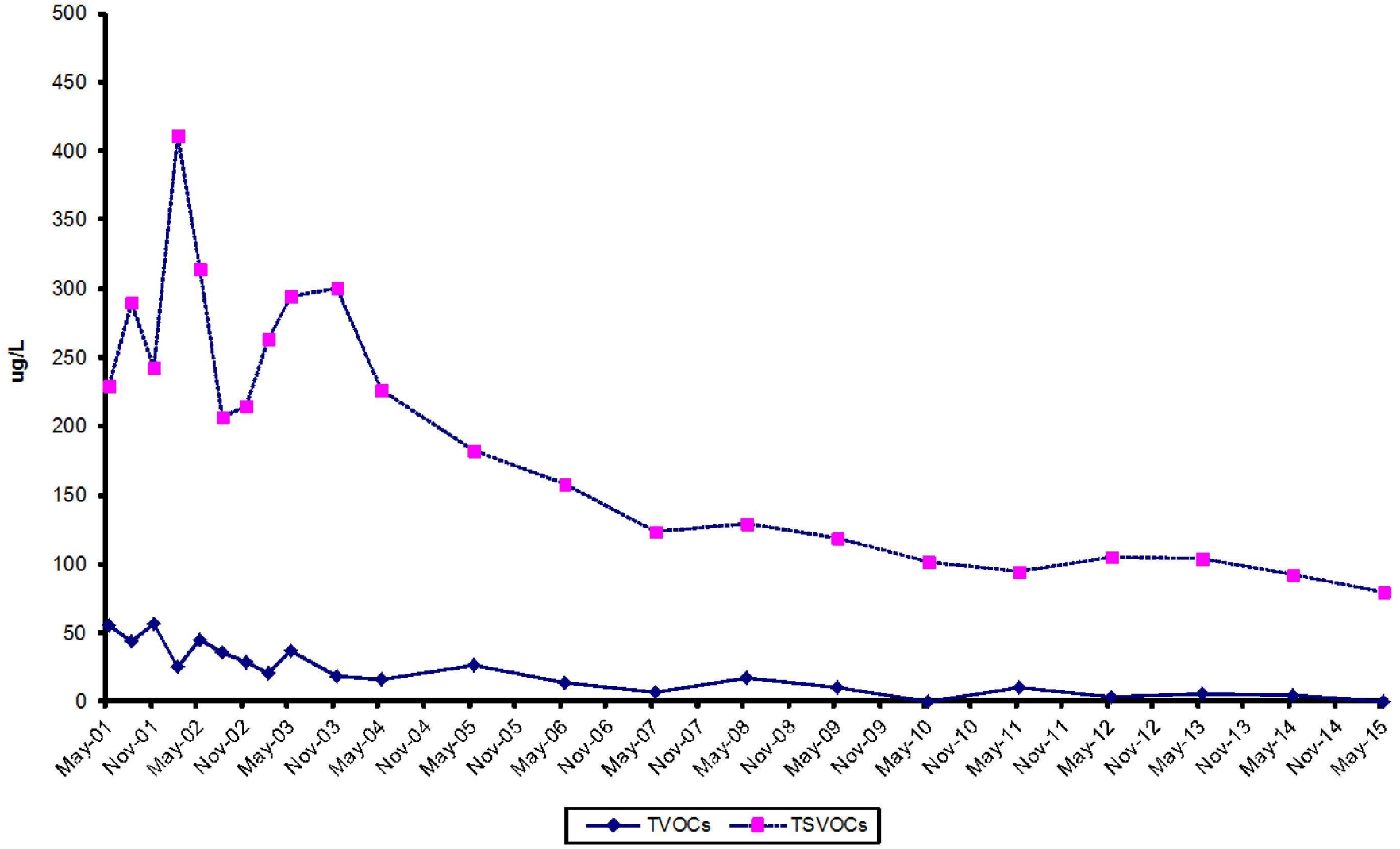


figure 2.8

OGC-3 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

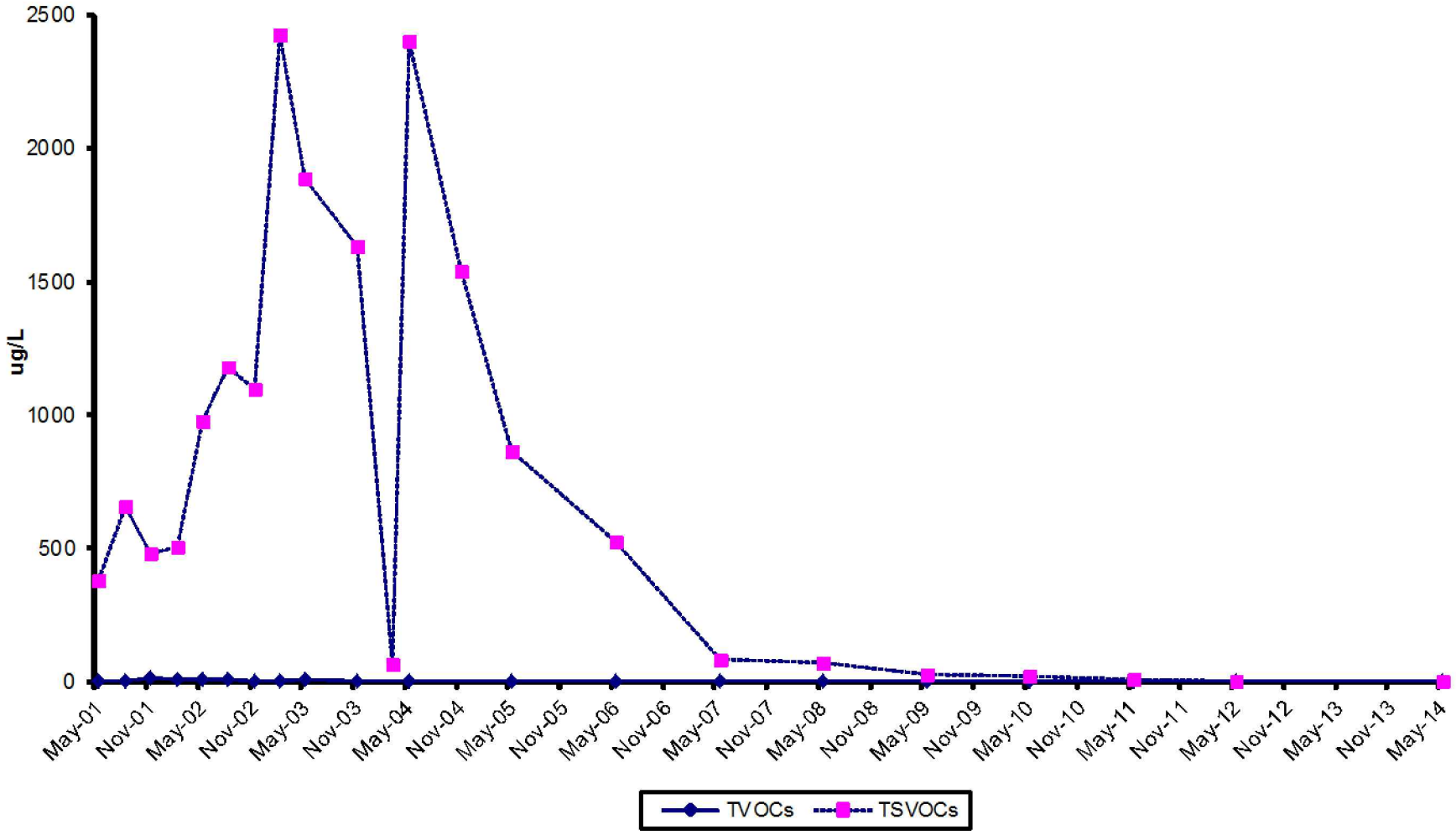


figure 2.9

OGC-4 TVOC AND TSVOC CONCENTRATIONS
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North Tonawanda, New York

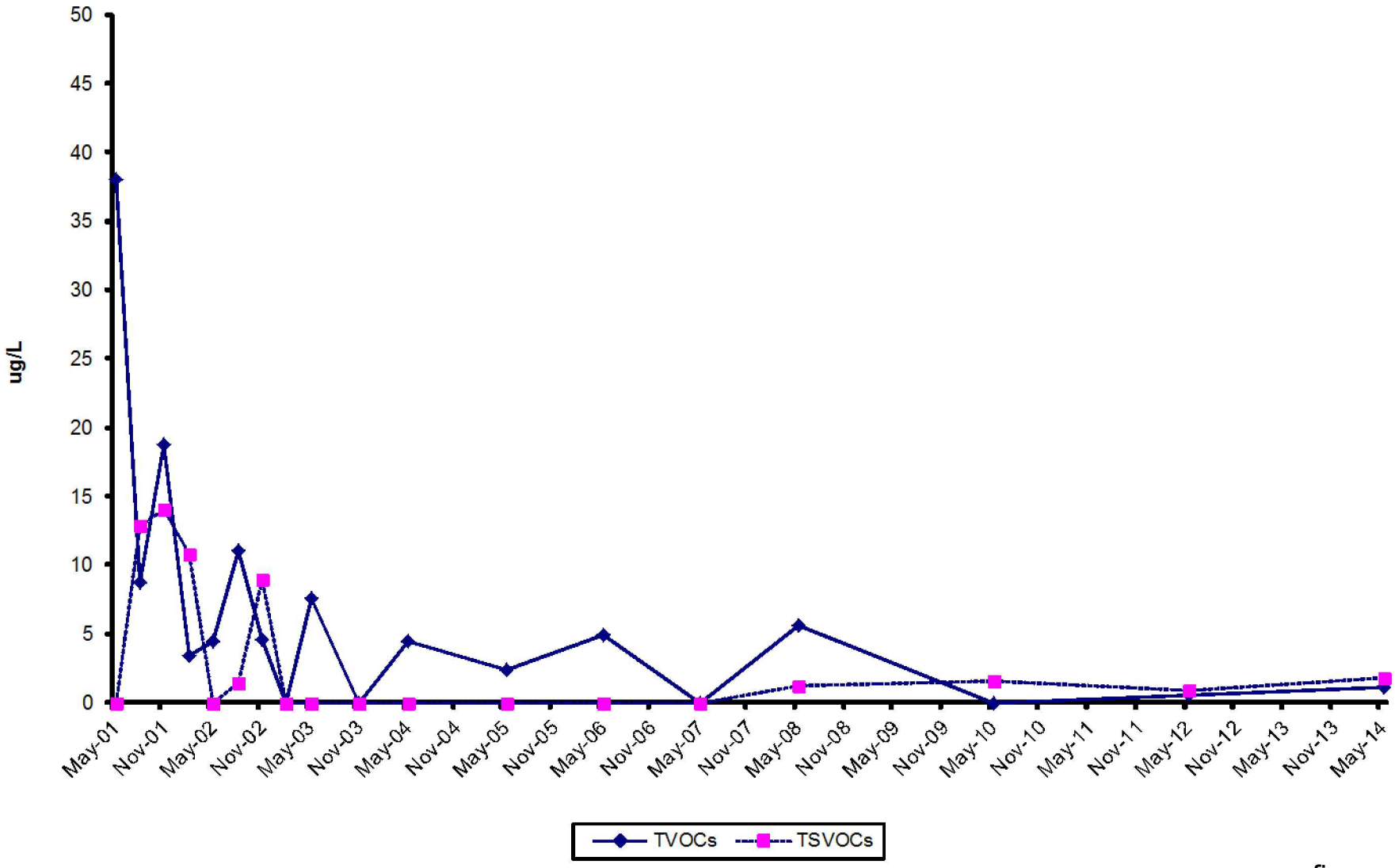

figure 2.10

OGC-5 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

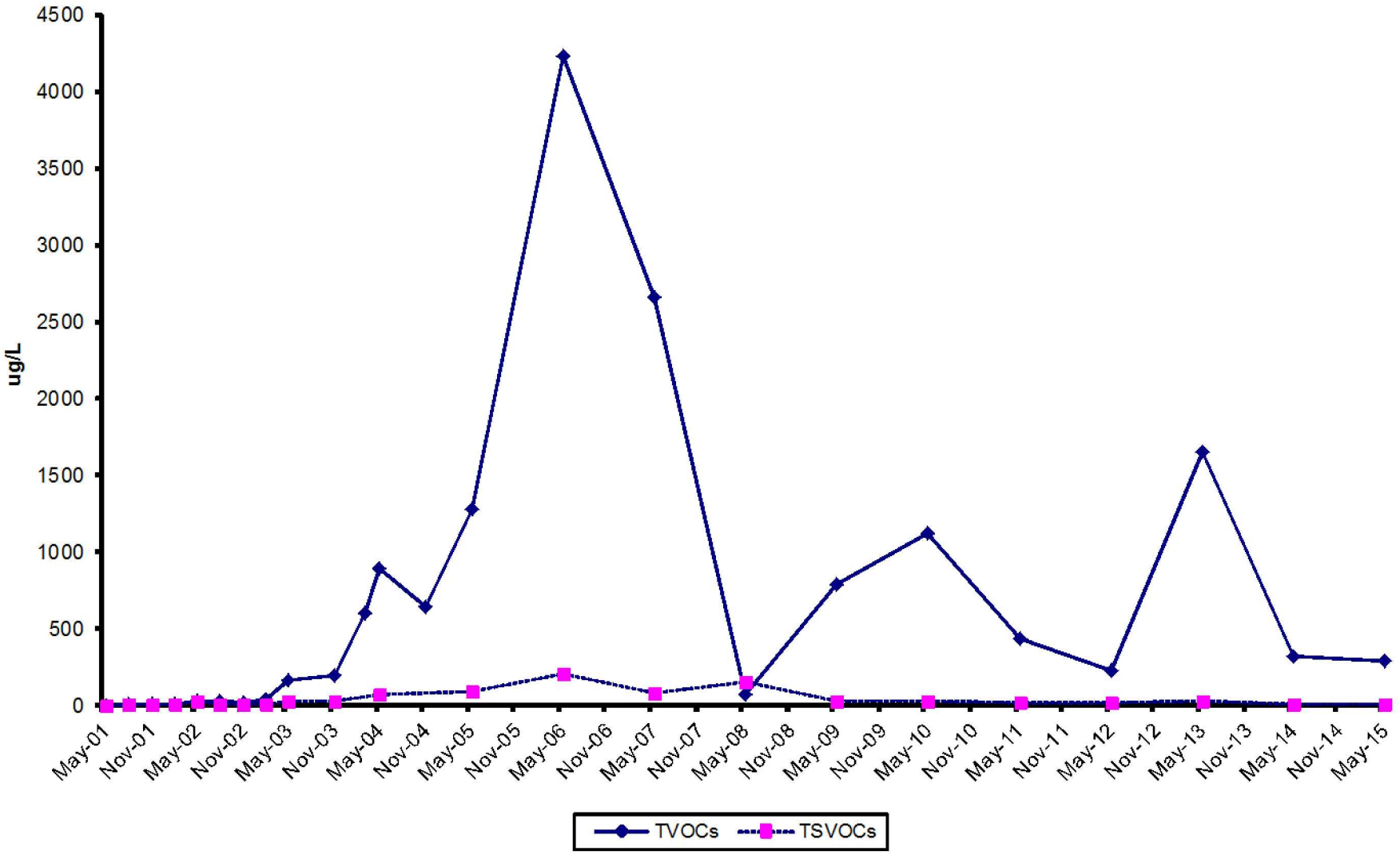

figure 2.11

OGC-6 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

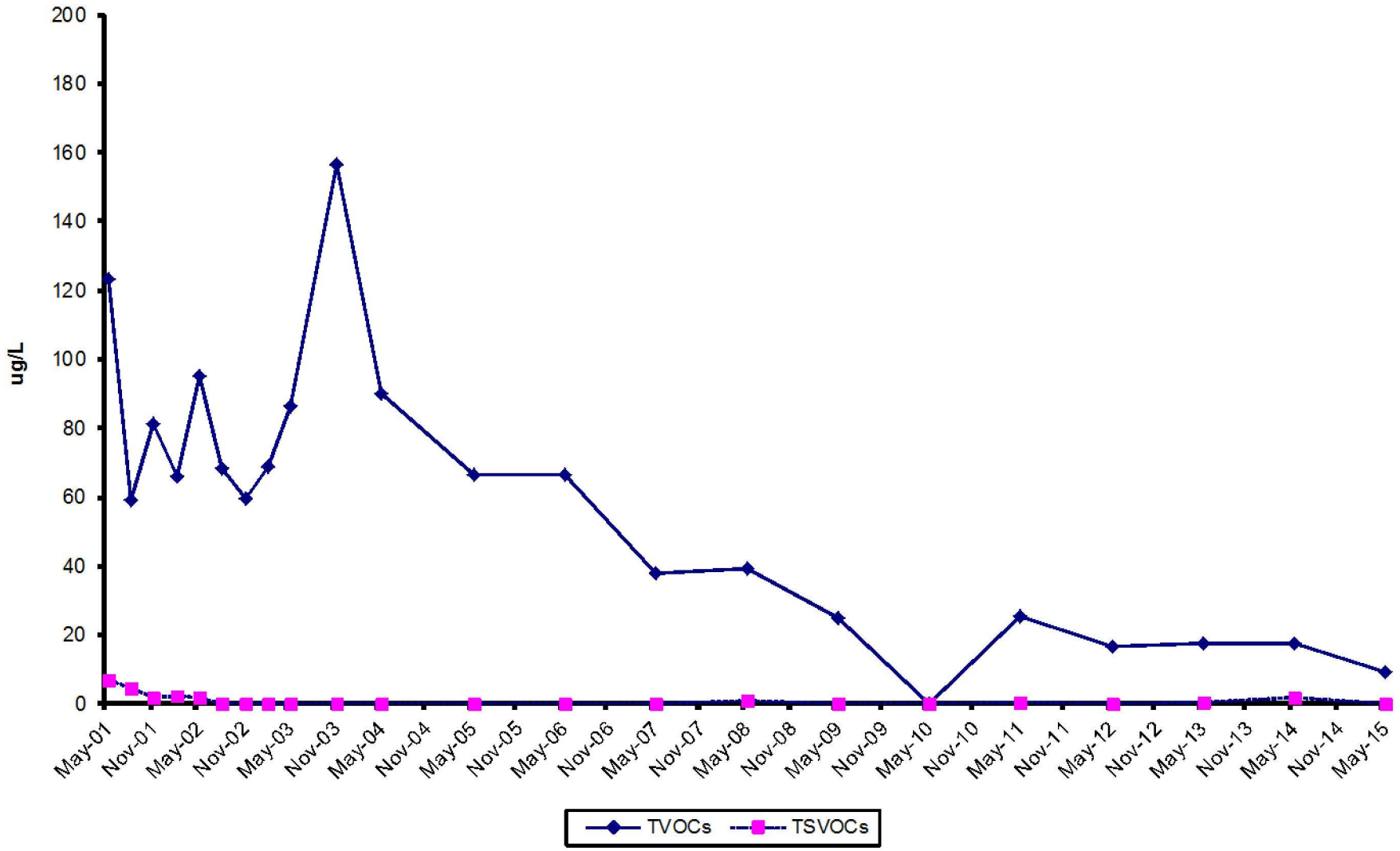

figure 2.12

OGC-7 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

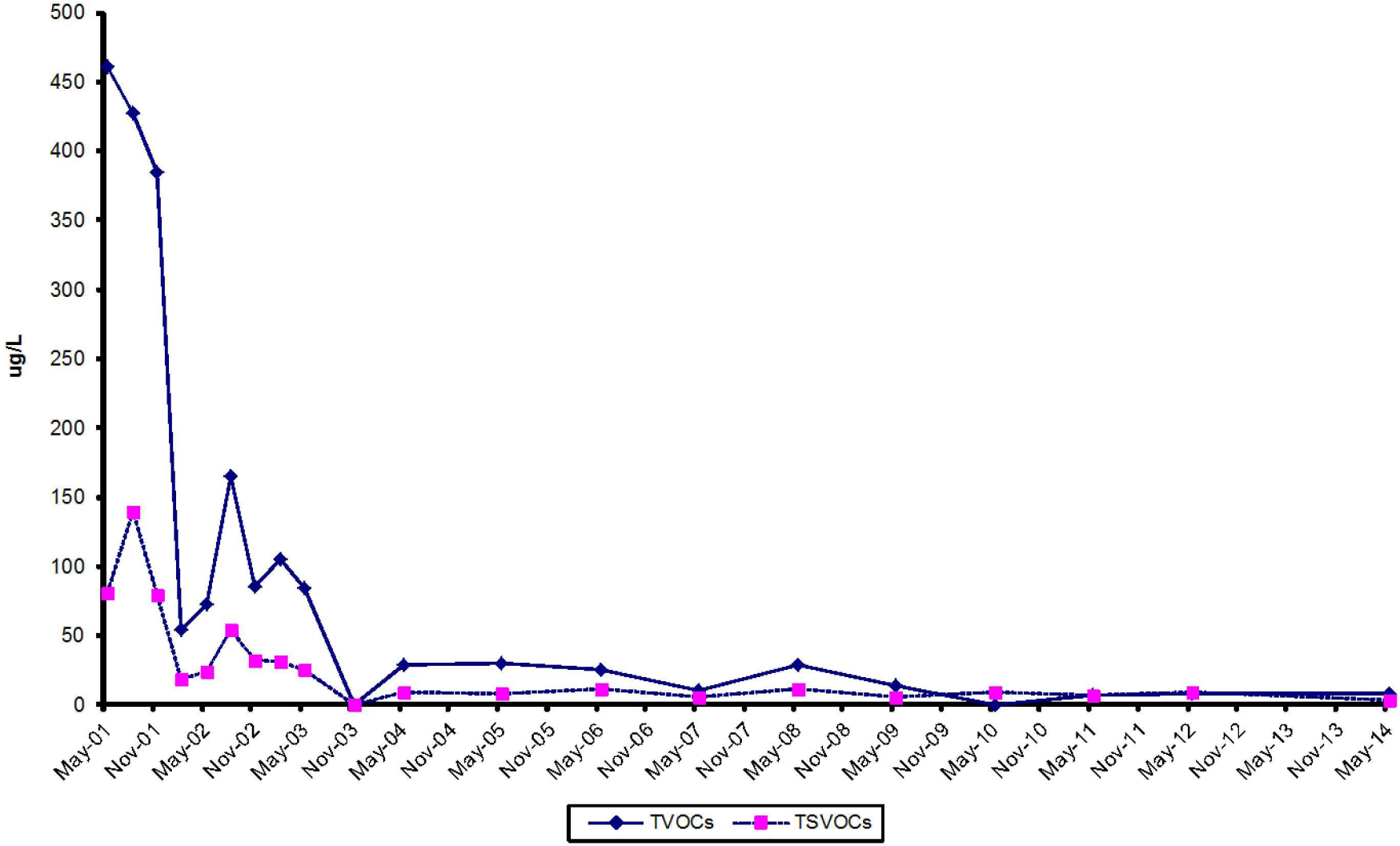

figure 2.13

OGC-8 TVOC AND TSVOC CONCENTRATIONS
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

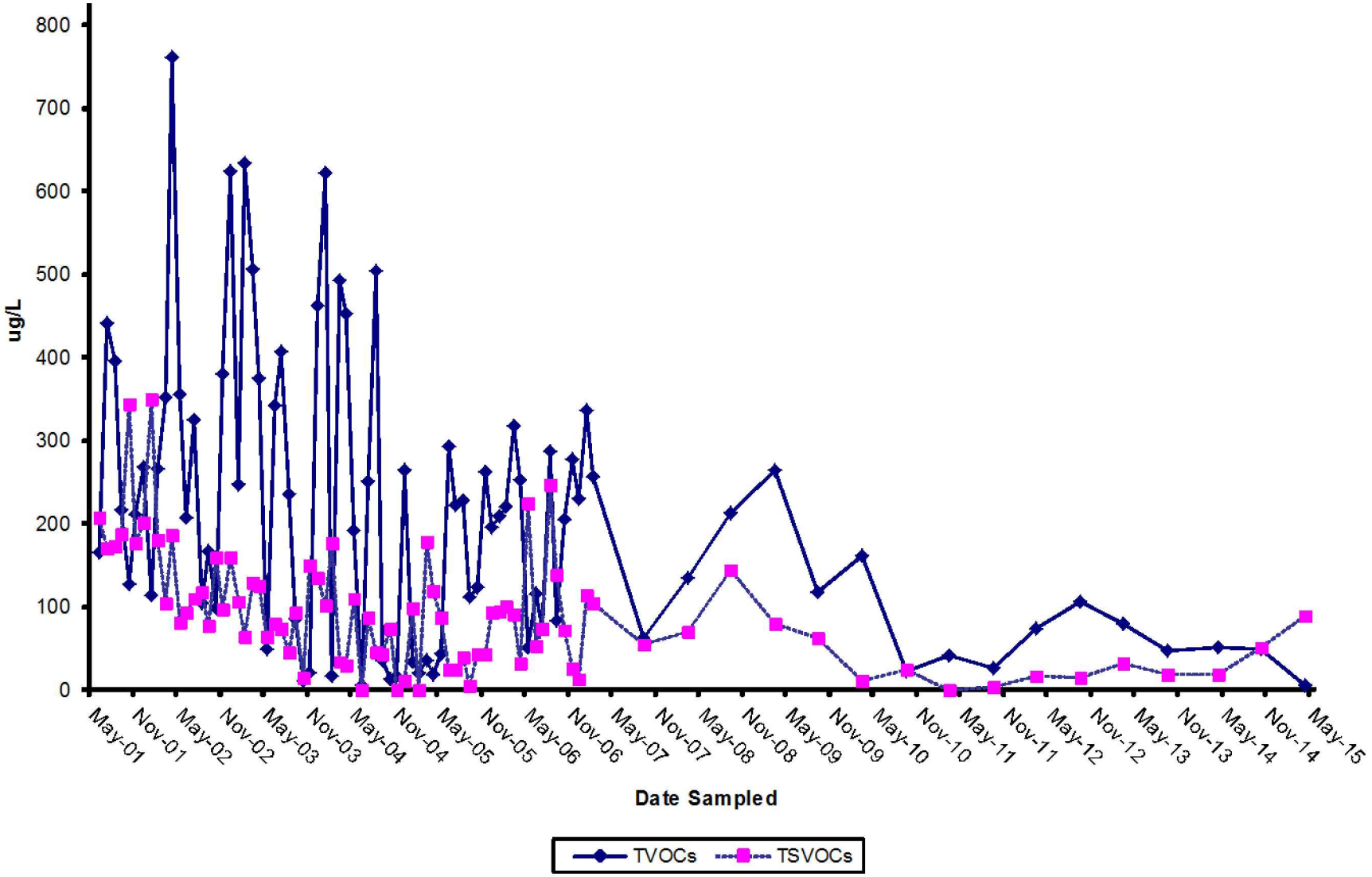

figure 2.14

EFFLUENT TVOCs AND TSVOCs vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

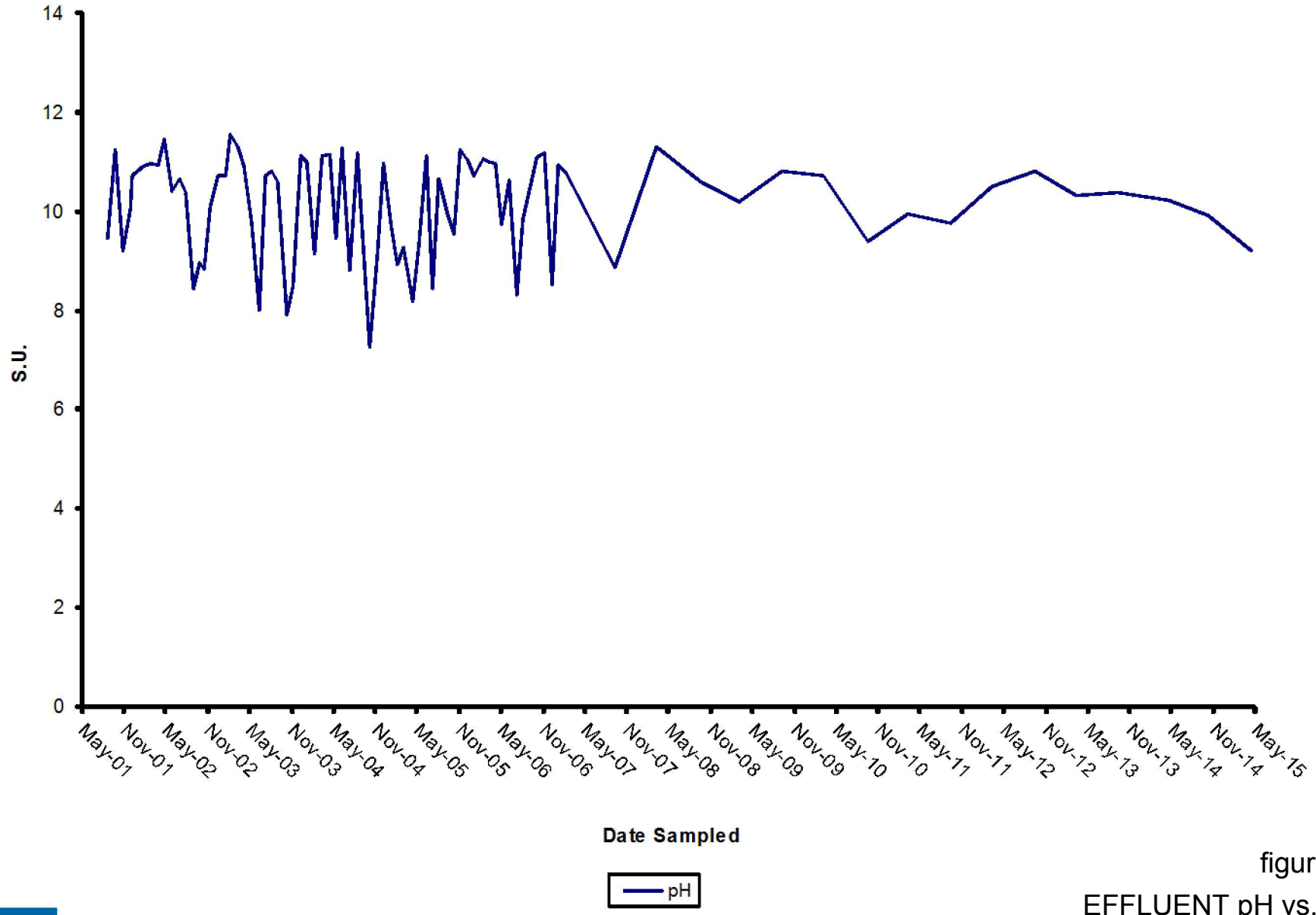

figure 2.15

EFFLUENT pH vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

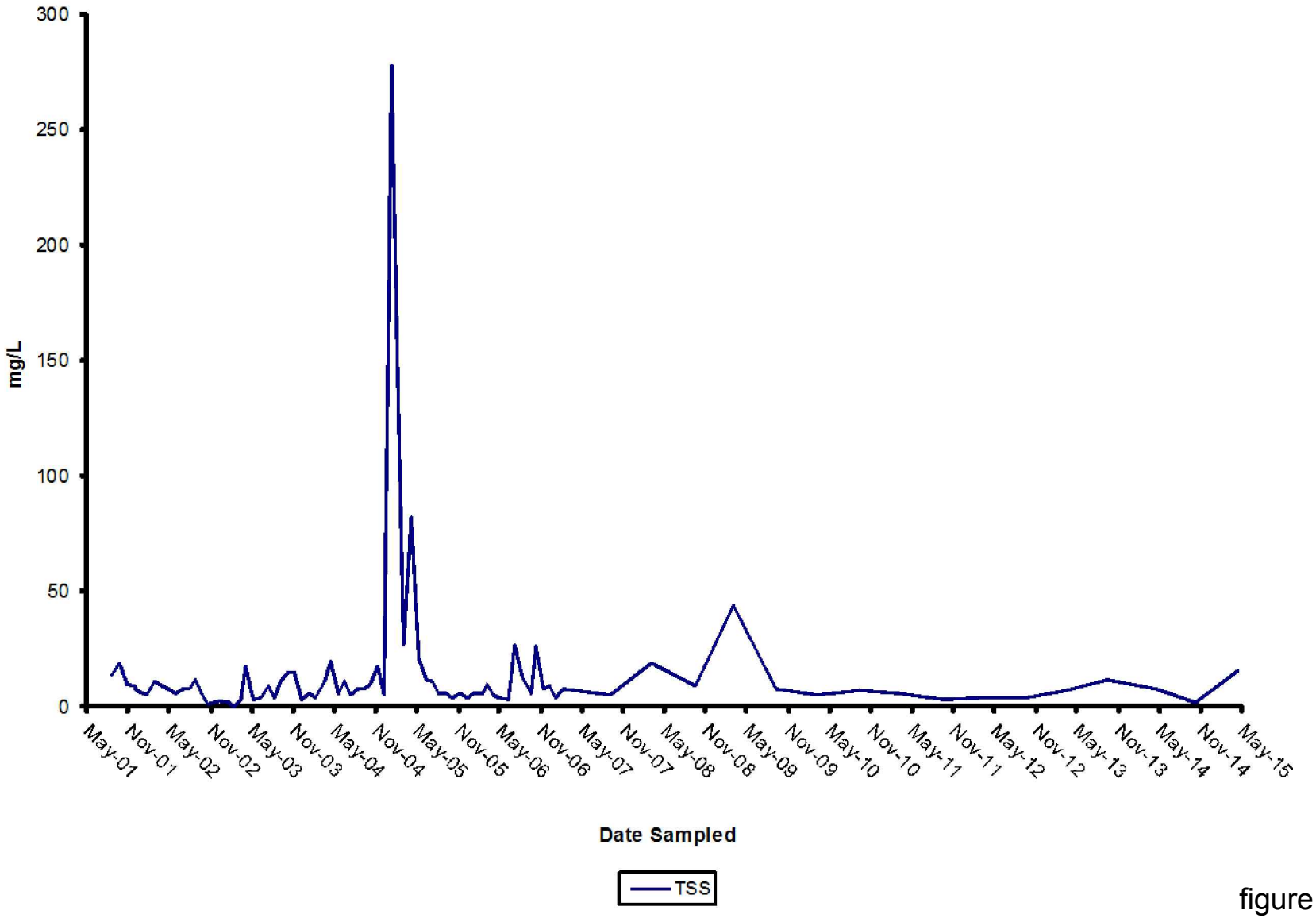

figure 2.16

EFFLUENT TOTAL SUSPENDED SOLIDS vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

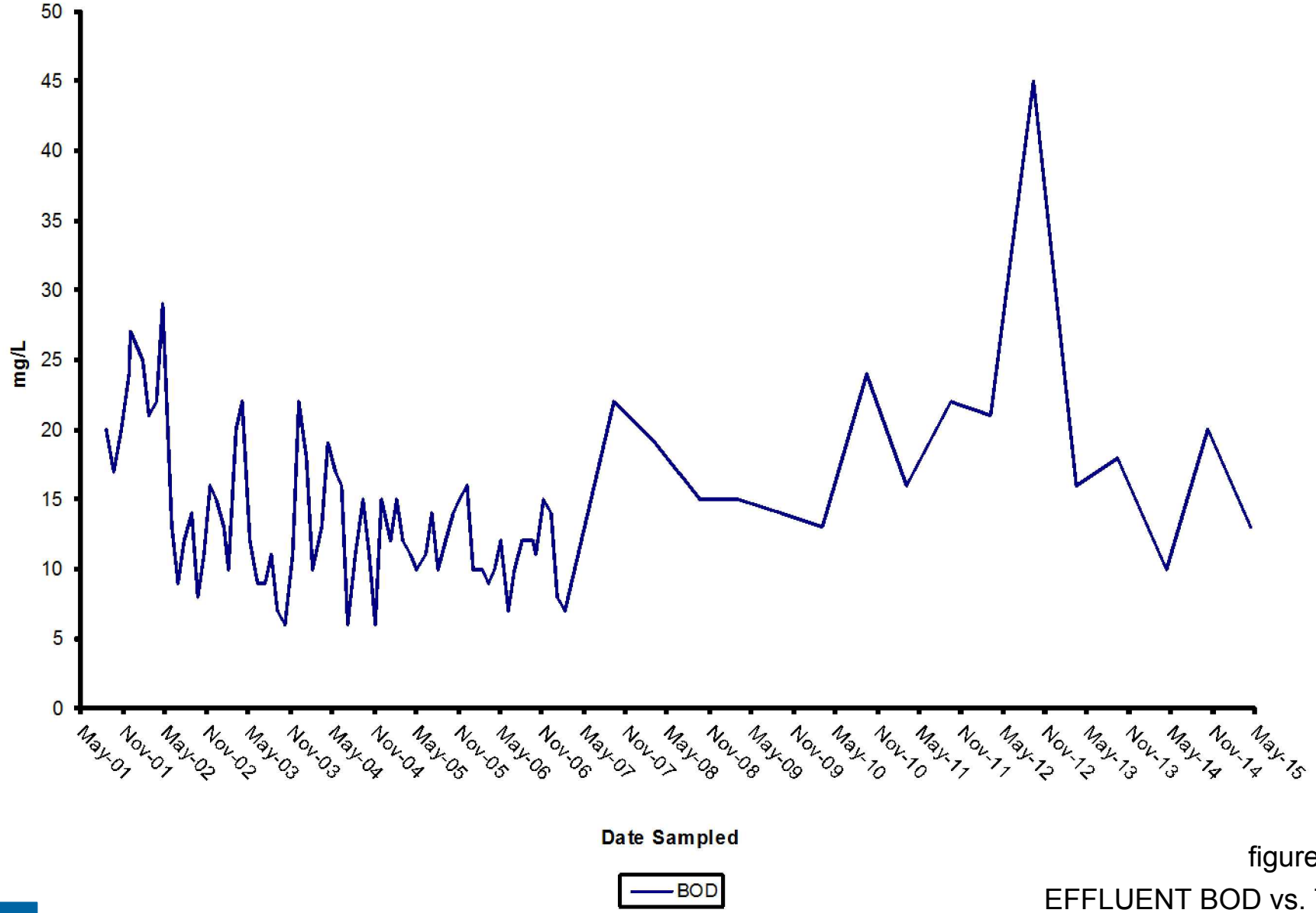

figure 2.17

EFFLUENT BOD vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

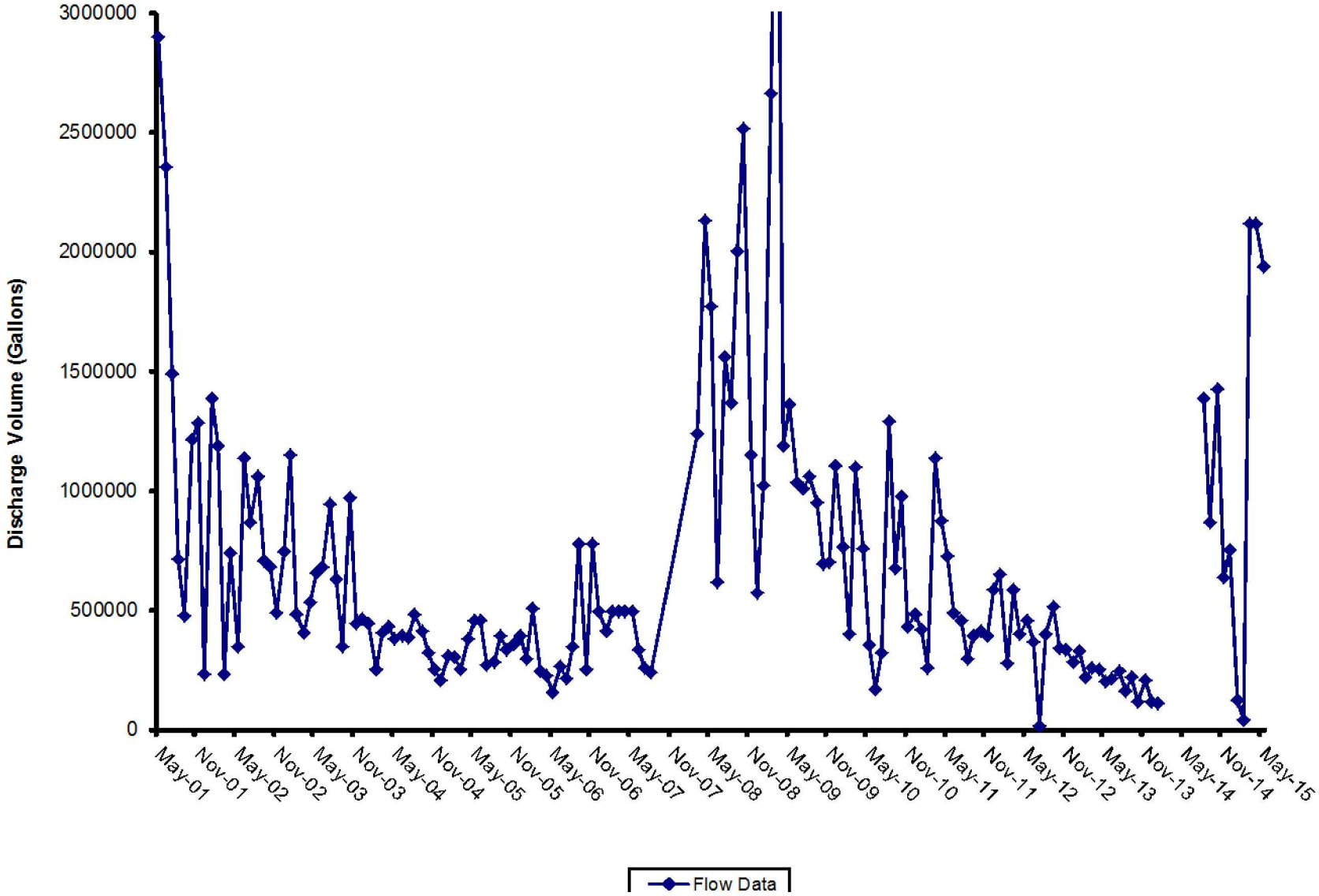

figure 2.18

EFFLUENT VOLUME vs. TIME
GRATWICK-RIVERSIDE PARK SITE
North Tonawanda, New York

Table 2.1

Groundwater Hydraulic Monitoring Locations
Operation and Maintenance
Gratwick-Riverside Park Site
North Tonawanda, New York

Inward Hydraulic Gradient Monitoring Locations

Inner [(1)]	Outer
MH2	Niagara River North (Downstream)
MH6	Niagara River North (Downstream)
MH8	Niagara River Middle
MH12	Niagara River South (Upstream)

Upward Hydraulic Gradient Monitoring Locations

Upper [(1)]	Lower
MH3	MW-6
MH8	MW-7
MH11	MW-8
MH14/MH15 [(2)]	MW-9

Frequency

- Weekly following GWS startup until six consecutive inward gradients are achieved.
- Monthly thereafter for the remainder of the initial 2-year period (review after 2 years).
- 2-Year and 5-Year reviews indicated that the monitoring frequency remain monthly.

Notes:

(1) These manholes will be monitored twice daily by POTW staff during a wet weather bypass event pursuant to Section 5.0 of the O&M Manual.

(2) Distance weighted averages of water levels used (MH14 - two thirds and MH15 - one third).

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH2	MH3	MH6	OGC-1	MW-6	OGC-5	River North	OGC-6	MH8	MW-7	OGC-2	River Middle	OGC-7
RIM Elevation	573.28	573.81	572.03						572.37				
TOC Elevation (ft amsl)				575.01	575.40	573.82	566.80	576.65		575.57	574.08	566.48	572.49
June 22, 2011	563.34	560.50	557.45	565.32	563.59	565.30	565.16	565.13	562.04	562.39	565.36	565.06	565.38
July 27, 2011	563.00	560.69	557.11	565.09	563.29	565.02	564.93	563.96	561.73	562.15	565.24	564.86	565.17
August 26, 2011	562.86	560.58	556.99	565.16	563.09	565.20	565.07	564.97	561.64	562.06	565.19	564.99	565.31
September 27, 2011	562.86	560.49	557.00	564.98	563.02	565.03	564.87	564.80	561.66	562.12	564.97	564.80	565.18
October 28, 2011	563.16	560.12	557.17	565.20	563.21	564.93	(1)	564.84	561.76	562.36	565.00	564.70	565.09
November 30, 2011	562.86	560.99	556.78	565.06	562.99	564.61	(1)	564.54	561.37	562.06	564.82	564.27	564.81
December 29, 2011	563.69	561.38	557.65	565.05	563.81	564.69	(1)	564.77	562.06	562.45	564.90	564.30	564.86
January 26, 2012	563.77	560.53	557.74	564.93	563.88	564.53	(1)	564.69	562.07	562.41	564.88	564.35	564.70
February 28, 2012	563.72	560.12	557.56	564.96	563.81	564.58	(1)	564.69	561.98	562.30	564.86	564.26	564.74
March 29, 2012	563.36	560.20	557.14	564.63	563.53	564.59	(1)	564.52	561.59	561.94	564.69	564.28	564.97
April 26, 2012	563.56	560.58	557.42	565.19	563.51	564.76	(1)	564.74	561.81	562.09	564.96	564.46	564.90
May 30, 2012	563.97	560.57	557.91	564.86	564.12	564.90	(1)	564.78	562.36	562.46	565.05	564.86	565.07
June 27, 2012	563.35	561.29	557.84	564.62	563.97	563.90	564.77	564.51	562.22	562.31	564.69	564.59	564.85
July 31, 2012	564.51	561.19	559.08	564.70	564.64	564.80	(1)	564.55	563.85	564.69	564.79	564.72	564.93
August 27, 2012	564.34	561.22	558.34	564.66	564.61	564.78	564.72	564.44	562.99	563.35	564.75	564.60	564.90
September 24, 212	563.36	561.20	557.36	564.84	563.60	564.82	564.67	564.65	561.94	562.29	564.79	564.60	564.98
October 26, 2012	563.39	559.91	557.40	564.54	563.54	564.31	(1)	564.32	561.94	562.34	564.49	564.04	564.49
November 26, 2012	563.50	561.25	557.20	564.09	563.57	563.99	(1)	564.01	561.66	561.94	564.17	563.71	564.11
December 26, 2012	563.64	561.19	557.37	564.00	563.66	563.39	(1)	563.94	561.75	562.21	564.04	(1)	563.71
January 30, 2013	564.00	560.19	557.80	564.27	564.12	564.16	(1)	563.96	562.33	562.45	564.26	563.03	564.35
February 27, 2013	563.96	560.71	557.86	564.27	563.92	563.86	(1)	563.87	562.79	562.38	564.77	563.18	563.98
March 27, 2013	536.97	560.29	557.45	564.13	563.98	564.13	(1)	563.97	561.94	562.05	564.06	563.86	564.21
April 24, 2013	564.33	560.57	557.97	564.69	564.58	564.64	(1)	564.54	562.49	562.57	564.65	564.31	564.75
May 24, 2013	564.09	560.85	557.81	564.44	563.18	564.39	(1)	564.36	562.41	562.40	564.54	564.16	564.49
June 27, 2013	564.37	559.69	557.96	564.70	564.59	564.78	564.23	564.57	562.69	562.86	564.78	564.58	564.89
July 24, 2013	564.38	560.60	558.10	565.22	564.52	565.11	565.11	566.04	562.93	563.28	565.25	564.95	565.28
August 22, 2013	564.18	560.40	557.71	565.02	564.24	565.10	565.02	564.93	562.41	562.46	565.05	564.95	565.25
September 30, 2013	564.17	560.68	557.72	564.88	564.28	564.98	564.87	564.76	564.40	562.48	564.97	564.74	565.11
October 30, 2013	564.47	560.63	558.05	564.81	564.64	564.57	(1)	564.53	562.79	562.98	564.76	564.30	564.69
November 27, 2013	564.44	560.33	557.69	564.44	564.52	564.14	(1)	564.24	562.35	562.40	564.43	563.63	564.29
December 31, 2013	564.41	561.39	558.11	564.64	564.74	564.41	(1)	564.33	562.86	563.09	564.45	564.43	564.56
January 30, 2014	564.13	559.88	557.64	565.03	564.14	564.90	564.80	564.87	562.41	562.40	565.09	(2)	565.07
February 26, 2014	567.53	570.48	558.01	564.44	565.29	564.32	(1)	564.20	562.81	562.78	564.44	563.98	564.45
March 28, 2014	564.10	559.36	557.62	564.26	564.01	564.09	564.96	564.13	562.21	562.01	564.29	564.39	564.21
April 25, 2014	564.42	560.21	558.36	564.81	564.74	564.50	(1)	564.44	563.03	562.95	564.67	564.28	564.63
May 29, 2014	564.46	559.12	558.41	564.92	564.71	564.57	(1)	564.70	563.20	563.21	564.91	564.60	564.88
June 25, 2014	564.38	560.62	558.14	564.88	564.46	564.93	564.80	564.87	562.88	562.94	565.08	564.67	565.13
July 29, 2014	564.24	560.42	557.93	565.04	564.28	564.96	(1)	564.81	562.72	562.84	565.11	564.78	565.10
August 26, 2014	564.26	561.12	557.84	564.80	564.26	564.91	564.91	564.69	562.58	562.49	564.90	564.77	565.08
September 30, 2014	564.01	560.65	557.82	564.63	564.07	564.65	564.67	564.50	562.51	562.36	564.70	564.54	564.78
October 29, 2014	564.06	559.77	557.82	564.73	564.09	564.83	564.81	564.63	562.54	562.35	564.77	564.65	565.00
November 25, 2014	563.88	560.70	557.44	565.39	563.89	565.64	565.41	564.96	562.09	561.92	565.13	NM	565.71
December 30, 2014	567.26	571.05	557.71	564.58	564.53	564.29	(1)	564.33	562.31	562.20	564.40	563.90	564.45

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH2	MH3	MH6	OGC-1	MW-6	OGC-5	River North	OGC-6	MH8	MW-7	OGC-2	River Middle	OGC-7
RIM Elevation	573.28	573.81	572.03						572.37				
TOC Elevation (ft amsl)				575.01	575.40	573.82	566.80	576.65		575.57	574.08	566.48	572.49
January 28, 2015	565.60	565.06	559.07	564.59	564.82	564.91	564.85	564.46	563.96	564.72	564.55	564.78	564.98
February 24, 2015	565.75	565.39	559.45	564.37	565.18	564.55	(2)	564.21	(2)	565.17	564.62	(2)	564.66
March 25, 2015	564.69	560.93	558.97	564.50	565.07	564.04	(1)	564.16	563.76	564.14	564.36	563.63	564.21
April 23, 2015	565.70	560.48	559.94	565.13	565.89	565.03	564.82	564.93	564.85	565.34	565.03	564.60	565.17
May 29, 2015	564.77	561.40	558.47	564.74	564.58	564.70	564.78	564.70	563.26	563.59	564.93	564.65	564.95

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH9	OGC-3	MH11	MW-8	River South	MH12	OGC-8	OGC-4	MW-9	MH14	MH15	MH16
RIM Elevation			572.11			572.37				574.30	575.84	574.82
TOC Elevation (ft amsl)	572.55	573.35		574.37	568.46		574.01	574.66	576.23			
June 22, 2011		565.51	562.24	562.95	565.44	560.52	565.50	565.55	565.04	565.11	564.07	565.04
July 27, 2011		565.27	561.80	562.55	565.22	560.13	565.28	565.28	564.71	564.77	563.73	564.71
August 26, 2011		565.43	561.55	562.35	565.43	559.94	565.48	565.40	564.50	564.52	563.47	564.44
September 27, 2011		565.24	561.47	562.28	565.24	559.86	565.28	565.26	564.40	564.39	563.36	564.36
October 28, 2011		565.18	562.13	562.78	565.11	560.37	565.23	565.23	565.02	565.09	564.02	565.03
November 30, 2011		564.86	562.17	562.72	564.80	560.36	564.93	564.94	564.88	564.96	563.88	564.95
December 29, 2011		564.92	562.69	563.34	564.77	560.88	564.90	565.02	565.36	565.34	564.25	565.39
January 26, 2012		564.72	562.97	563.48	564.56	561.06	564.78	564.80	565.61	565.59	564.53	565.63
February 28, 2012		564.72	562.78	563.39	564.58	561.02	564.71	564.88	565.62	565.59	564.53	565.61
March 29, 2012		564.77	562.54	563.15	564.73	560.79	564.85	564.85	565.31	565.32	564.23	565.31
April 26, 2012		564.92	562.37	562.99	564.84	560.61	564.95	565.02	565.17	565.19	564.11	565.16
May 30, 2012		565.21	562.35	562.89	565.27	560.57	565.27	565.20	565.11	565.22	564.11	565.17
June 27, 2012		564.96	562.11	562.70	565.03	560.31	565.08	564.94	564.84	564.88	563.82	564.83
July 31, 2012		565.01	564.00	564.55	565.07	561.88	565.11	565.02	564.71	564.77	563.72	564.66
August 27, 2012		564.99	562.42	563.00	565.03	560.56	565.08	565.00	564.81	564.87	563.81	564.79
September 24, 212		565.03	562.05	562.64	565.00	560.22	565.08	565.04	564.52	564.58	563.52	564.50
October 26, 2012		564.48	561.96	562.55	564.43	560.09	564.53	564.55	564.49	564.57	563.51	564.47
November 26, 2012		564.17	562.29	562.96	564.15	560.58	564.20	564.23	564.91	565.02	563.96	564.97
December 26, 2012		563.73	562.52	563.09	(1)	560.75	563.63	563.77	565.17	565.22	564.15	565.14
January 30, 2013		564.36	563.02	563.84	564.36	561.37	564.42	564.37	565.67	565.63	564.58	565.66
February 27, 2013		564.13	563.08	563.61	564.16	561.48	564.17	564.12	565.70	565.68	564.62	565.72
March 27, 2013		564.26	563.17	563.54	564.24	561.41	564.35	564.35	565.59	565.66	564.61	565.61
April 24, 2013		564.82	563.22	563.78	564.74	561.66	564.87	564.83	565.85	565.89	564.82	566.60
May 24, 2013		562.59	562.86	563.38	564.60	561.27	564.72	564.66	565.31	565.39	564.32	565.34
June 27, 2013		562.02	563.08	563.61	565.00	561.50	565.08	564.99	565.66	565.68	564.63	565.69
July 24, 2013		565.36	563.04	563.56	565.37	561.40	565.42	565.30	565.47	565.40	564.27	565.44
August 22, 2013		565.37	562.87	563.37	565.37	561.17	565.38	565.29	565.19	565.16	564.08	565.18
September 30, 2013		565.17	563.73	563.25	565.15	561.03	565.24	565.15	565.05	565.06	564.01	565.03
October 30, 2013		564.73	562.96	563.53	564.74	561.35	564.83	564.73	565.50	565.48	564.45	565.54
November 27, 2013		564.33	563.08	563.58	564.30	561.39	564.39	564.38	565.47	565.53	564.52	565.35
December 31, 2013		564.72	563.53	564.06	564.87	561.78	564.89	564.63	565.76	565.78	564.71	565.86
January 30, 2014		565.14	563.40	563.95	565.63	561.65	565.20	565.17	565.52	565.51	564.51	565.61
February 26, 2014		564.55	563.28	563.83	564.55	561.48	564.65	564.59	565.46	565.57	564.51	565.55
March 28, 2014	560.87	564.24	563.58	564.10	564.38	561.78	564.40	564.26	565.93	565.98	564.88	565.97
April 25, 2014	559.42	564.72	563.90	564.44	564.70	562.08	564.77	564.73	566.12	566.22	565.18	566.24
May 29, 2014	561.05	564.99	564.01	564.37	564.92	562.06	564.98	564.88	565.77	566.07	565.00	566.07
June 25, 2014	561.27	565.14	563.53	564.03	565.11	561.68	565.84	565.21	565.60	565.69	564.62	565.64
July 29, 2014	560.93	565.18	563.41	563.75	565.15	561.37	565.25	565.14	565.21	565.30	564.23	565.14
August 26, 2014	560.63	565.18	563.11	563.61	565.15	561.25	565.28	565.11	565.20	565.28	564.16	565.20
September 30, 2014	559.52	564.92	562.89	563.31	564.96	560.97	565.01	564.89	564.89	565.04	563.92	564.96
October 29, 2014	560.59	565.14	562.78	563.23	565.15	560.87	565.18	565.14	564.77	564.91	563.80	564.81
November 25, 2014	561.55	565.76	562.71	563.18	565.56	560.85	565.80	565.89	564.76	564.92	563.85	564.79
December 30, 2014	560.91	564.52	562.98	563.43	564.45	561.15	564.59	564.62	565.13	565.22	564.15	565.16

Table 2.2

Water Levels (FT AMSL)
Gratwick-Riverside Park Site
North Tonawanda, New York

Date	MH9	OGC-3	MH11	MW-8	River South	MH12	OGC-8	OGC-4	MW-9	MH14	MH15	MH16
RIM Elevation			572.11			572.37				574.30	575.84	574.82
TOC Elevation (ft amsl)	572.55	573.35		574.37	568.46		574.01	574.66	576.23			
January 28, 2015	564.64	565.19	564.19	564.70	565.24	562.14	565.28	565.18	564.26	565.39	564.31	565.33
February 24, 2015	565.12	564.74	(2)	565.15	564.60	562.51	564.80	564.78	565.41	(2)	564.44	565.44
March 25, 2015	559.25	564.22	563.88	564.44	563.86	561.78	564.22	563.24	566.11	(2)	565.10	566.13
April 23, 2015	560.40	565.22	564.86	565.41	565.04	562.69	565.25	565.26	566.41	566.53	565.26	566.54
May 29, 2015	561.88	565.01	563.36	563.93	565.05	561.28	565.13	564.99	565.56	565.67	564.57	565.61

Notes:

(1) River level too low to obtain a measurement at the measuring location.
(2) Unable to access

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		6/22/2011		07/27/2011		08/26/2011		09/27/2011		10/28/2011		11/30/2011	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	565.16	Inward	564.93	Inward	565.07	Outward	564.87	Inward	564.86 (1)	Inward	564.55 (1)	Inward
Inner	MH2	563.34		563.00		562.86		562.86		563.16		562.86	
Outer	River North	565.16	Inward	564.93	Inward	562.07	Inward	564.87	Inward	564.86 (1)	Inward	564.55 (1)	Inward
Inner	MH6	557.45		557.11		556.99		557.00		557.17		556.78	
Outer	River Middle	565.06	Inward	564.86	Outward	564.99	Inward	564.80	Inward	564.70	Inward	564.27	Inward
Inner	MH8	562.04		561.73		561.64		561.66		561.76		561.37	
Outer	River South	565.44	Inward	565.22	Inward	565.43	Inward	565.24	Inward	565.11	Inward	564.80	Inward
Inner	MH12	560.52		560.13		559.94		559.86		560.37		560.36	

Monitoring Location		12/29/2011		01/26/2012		02/28/2012		03/29/2012		04/26/2012		05/30/2012	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.52 (1)	Inward	564.31 (1)	Inward	564.33 (1)	Inward	564.48 (1)	Inward	564.59 (1)	Inward	565.02 (1)	Inward
Inner	MH2	563.69		563.77		563.72		563.36		563.56		563.97	
Outer	River North	564.52 (1)	Inward	564.31 (1)	Inward	564.33 (1)	Inward	564.48 (1)	Inward	564.59 (1)	Inward	565.02 (1)	Inward
Inner	MH6	557.65		557.74		557.56		557.14		557.42		557.91	
Outer	River Middle	564.30	Inward	564.35	Inward	564.26	Inward	564.28	Inward	564.46	Inward	564.86	Inward
Inner	MH8	562.06		562.07		561.98		561.59		561.81		562.36	
Outer	River South	564.77	Inward	564.56	Inward	564.58	Inward	564.73	Inward	564.84	Inward	565.27	Inward
Inner	MH12	560.88		561.06		561.02		560.79		560.61		560.57	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2012		07/31/2012		08/27/2012		09/24/2012		10/26/2012		11/26/2012	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.77	Inward	564.82 [2]	Inward	564.72	Inward	564.67	Inward	564.18 [2]	Inward	563.90 [2]	Inward
Inner	MH2	563.35		564.51		564.34		563.36		563.39		563.50	
Outer	River North	564.77	Inward	564.82 [2]	Inward	564.72 [1]	Inward	564.67	Inward	564.18 [2]	Inward	563.90 [2]	Inward
Inner	MH6	557.84		559.08		558.34		557.36		557.40		557.20	
Outer	River Middle	564.59	Inward	564.72	Inward	564.60	Inward	564.60	Inward	564.04	Inward	563.71	Inward
Inner	MH8	562.22		563.85		562.99		561.94		561.94		561.66	
Outer	River South	565.03	Inward	565.07	Inward	565.03	Inward	565.00	Inward	564.43	Inward	564.15	Inward
Inner	MH12	560.31		561.88		560.56		560.22		560.09		560.58	

Monitoring Location		12/26/2012		01/30/2013		02/27/2013		03/27/2013		04/24/2013		05/24/2013	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	563.67 [2]	Inward	564.11 [2]	Inward	563.91 [2]	Outward	563.99 [2]	Inward	564.49 [2]	Inward	564.35 [2]	Inward
Inner	MH2	563.64		564.00		563.96		563.97		564.33		564.09	
Outer	River North	563.67 [2]	Inward	564.11 [2]	Inward	563.91 [2]	Inward	563.99 [2]	Inward	564.49 [2]	Inward	564.35 [2]	Inward
Inner	MH6	557.37		557.80		557.86		557.45		557.97		557.81	
Outer	River Middle	563.79 [1]	Inward	563.83	Inward	563.18	Inward	563.86	Inward	564.31	Inward	564.16	Inward
Inner	MH8	561.75		562.33		562.79		561.94		562.57		562.41	
Outer	River South	563.92 [3]	Inward	564.36	Inward	564.16	Inward	564.24	Inward	564.74	Inward	564.60	Inward
Inner	MH12	560.75		561.37		561.48		561.41		561.66		561.27	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2013		07/24/2013		08/22/2013		09/30/2013		10/30/2013		11/27/2013	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.75	Inward	565.11 [2]	Inward	565.10	Inward	564.87	Inward	564.49 [2]	Inward	564.05 [2]	Inward
Inner	MH2	564.37		564.38		564.18		564.17		564.47		564.94	
Outer	River North	564.75	Inward	565.11 [2]	Inward	565.10 [1]	Inward	564.87	Inward	564.49 [2]	Inward	564.05 [2]	Inward
Inner	MH6	557.96		558.10		557.71		557.72		558.05		557.69	
Outer	River Middle	564.58	Inward	564.95	Inward	564.95	Inward	564.74	Inward	564.30	Inward	563.63	Inward
Inner	MH8	562.69		562.93		562.41		562.48		562.79		562.35	
Outer	River South	565.00	Inward	565.37	Inward	565.37	Inward	565.15	Inward	564.74	Inward	564.30	Inward
Inner	MH12	561.50		561.40		561.17		561.03		561.35		561.39	

Monitoring Location		12/31/2013		01/30/2014		2/26/2014		3/28/2014		4/25/2014		5/29/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.62 [2]	Inward	564.80	Inward	564.30 [2]	Outward	564.96	Inward	564.45 [2]	Inward	564.67 [2]	Inward
Inner	MH2	564.41		564.13		567.53		564.10		564.42		564.46	
Outer	River North	564.62 [2]	Inward	564.80	Inward	564.30 [2]	Inward	564.96	Inward	564.45 [2]	Inward	564.67 [2]	Inward
Inner	MH6	558.11		557.64		558.01		557.62		558.36		558.41	
Outer	River Middle	564.93 [1]	Inward	565.50 [1]	Inward	563.98	Inward	564.39	Inward	564.28	Inward	564.60	Inward
Inner	MH8	562.86		562.41		562.81		562.21		563.03		563.20	
Outer	River South	564.87 [3]	Inward	565.63	Inward	564.55	Inward	564.38	Inward	564.70	Inward	564.92	Inward
Inner	MH12	561.78		561.65		561.48		561.78		562.08		562.06	

Table 2.3

Summary of Horizontal Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/25/2014		07/29/2014		08/26/2014		09/30/2014		10/29/2014		11/25/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.80	Inward	564.90 (2)	Inward	564.91	Inward	564.67	Inward	564.81	Inward	565.41	Inward
Inner	MH2	564.38		564.24		564.26		564.01		564.06		563.88	
Outer	River North	564.80	Inward	564.90 (2)	Inward	564.91 (1)	Inward	564.67	Inward	564.81	Inward	565.41	Inward
Inner	MH6	558.14		557.93		557.84		557.82		557.82		557.44	
Outer	River Middle	564.67	Inward	564.78	Inward	564.77	Inward	564.54	Inward	564.65	Inward	565.43 (1)	Inward
Inner	MH8	562.94		562.84		562.58		562.51		562.54		562.09	
Outer	River South	565.11	Inward	565.15	Inward	565.15	Inward	564.96	Inward	565.15	Inward	565.56	Inward
Inner	MH12	561.68		561.37		561.25		560.97		560.87		560.85	

Monitoring Location		12/30/2014		01/28/2015		02/24/2015		03/25/2015		04/23/2015		05/29/2015	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Outer	River North	564.20 (2)	Outward	564.85	Outward	564.35 (2)	Outward	563.61 (2)	Outward	564.82	Outward	564.78	Inward
Inner	MH2	567.26		565.50		565.75		564.69		565.70		564.77	
Outer	River North	564.20 (2)	Inward	564.85	Inward	564.35 (2)	Inward	563.61 (2)	Inward	564.82	Inward	564.78	Inward
Inner	MH6	557.71		559.07		559.45		558.97		559.94		558.47	
Outer	River Middle	563.90	Inward	564.78	Inward	564.47 (1)	NC	563.63	Outward	564.60	Outward	564.65	Inward
Inner	MH8	562.20		563.96		NM		563.76		564.85		563.26	
Outer	River South	564.45	Inward	565.24	Inward	564.80	Inward	563.86	Inward	565.04	Inward	565.05	Inward
Inner	MH12	561.15		562.14		562.51		561.78		562.69		561.28	

Notes:

(1) River level too low to obtain a measurement. Water level shown is River South water level minus 0.13 feet.
(2) River level too low to obtain a measurement. Water level shown is River South Water level minus 0.25 feet.
(3) River level too low to obtain a measurement. Lowest recorded level (i.e., 563.92) since start of system operation used
NM - Not Measured
NC - Not Calculated

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Location	Location	06/22/2011		07/27/2011		08/26/2011		09/27/2011		10/28/2011		11/30/2011	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.50	Upward	560.69	Upward	560.58	Upward	560.49	Upward	560.12	Upward	560.99	Upward
Lower	MW-6	563.59		563.29		563.09		563.02		563.21		562.99	
Upper	MH8	562.04	Upward	561.73	Upward	561.64	Upward	561.66	Upward	561.76	Upward	561.37	Upward
Lower	MW-7	562.39		562.15		562.06		562.12		562.36		562.06	
Upper	MH11	562.24	Upward	561.80	Upward	561.55	Upward	561.47	Upward	562.13	Upward	562.17	Upward
Lower	MW-8	562.95		562.55		562.35		562.28		562.78		562.72	
Average [1]		564.76	Upward	564.42	Upward	564.17	Upward	564.05	Upward	564.73	Upward	564.60	Upward
Lower	MW-9	565.04		564.71		564.50		564.40		565.02		564.88	

Location	Location	12/29/2011		01/26/2012		02/28/2012		03/29/2012		04/26/2012		05/30/2012	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	561.38	Upward	560.53	Upward	560.12	Upward	560.20	Upward	560.58	Upward	560.57	Upward
Lower	MW-6	563.81		563.88		563.81		563.53		563.51		564.12	
Upper	MH8	562.06	Upward	562.07	Upward	561.98	Upward	561.59	Upward	561.81	Upward	562.36	Upward
Lower	MW-7	562.45		562.41		562.30		561.94		562.09		562.46	
Upper	MH11	562.69	Upward	562.97	Upward	562.78	Upward	562.54	Upward	562.37	Upward	562.35	Upward
Lower	MW-8	563.34		563.48		563.39		563.15		562.99		562.89	
Average [1]		564.98	Upward	565.24	Upward	565.24	Upward	564.96	Upward	564.83	Upward	564.85	Upward
Lower	MW-9	565.36		565.61		565.62		565.31		565.17		565.11	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Location	Location	06/27/2012		07/31/2012		08/27/2012		09/24/2012		10/26/2012		11/26/2012	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	561.29	Upward	561.19	Upward	561.22	Upward	561.20	Upward	559.91	Upward	561.25	Upward
Lower	MW-6	563.97		564.64		564.61		563.60		563.54		563.57	
Upper	MH8	562.22	Upward	563.85	Upward	562.99	Upward	561.94	Upward	561.94	Upward	561.66	Upward
Lower	MW-7	562.31		564.69		563.35		562.29		562.34		561.94	
Upper	MH11	562.11	Upward	564.00	Upward	562.42	Upward	562.05	Upward	561.96	Upward	562.29	Upward
Lower	MW-8	562.70		564.55		563.00		562.64		562.55		562.96	
Average [1]		564.53	Upward	564.42	Upward	564.52	Upward	564.23	Upward	564.22	Upward	564.67	Upward
Lower	MW-9	564.84		564.71		564.81		564.52		564.49		564.91	

Location	Location	12/26/2012		01/30/2013		02/27/2013		3/27/2013		4/24/2013		5/24/2013	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.19	Upward	560.19	Upward	560.71	Upward	560.29	Upward	560.57	Upward	560.85	Upward
Lower	MW-6	563.66		564.12		563.92		563.98		564.58		564.18	
Upper	MH8	561.75	Upward	562.33	Upward	562.79	Downward	561.94	Upward	562.49	Upward	562.41	Downward
Lower	MW-7	562.21		562.45		562.38		562.05		562.57		562.40	
Upper	MH11	562.52	Upward	563.02	Upward	563.08	Upward	563.17	Upward	563.22	Upward	562.86	Upward
Lower	MW-8	563.09		563.84		563.61		563.54		563.78		563.38	
Average [1]		564.86	Upward	565.28	Upward	565.33	Upward	565.31	Upward	565.53	Upward	565.03	Upward
Lower	MW-9	565.17		565.67		565.70		565.59		565.85		565.31	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/27/2013		07/24/2013		08/22/2013		09/30/2013		10/30/2013		11/27/2013	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	559.69	Upward	560.60	Upward	560.40	Upward	560.68	Upward	560.63	Upward	560.33	Upward
Lower	MW-6	564.59		564.52		564.24		564.28		564.64		564.52	
Upper	MH8	562.69	Upward	562.95	Upward	562.41	Upward	562.40	Upward	562.79	Upward	562.35	Upward
Lower	MW-7	562.86		563.28		562.46		562.48		562.98		562.40	
Upper	MH11	563.08	Upward	563.04	Upward	562.87	Upward	562.73	Upward	561.96	Upward	563.08	Upward
Lower	MW-8	563.61		563.56		563.37		563.23		563.53		563.58	
Average [1]		565.33	Upward	565.06	Upward	564.80	Upward	564.71	Upward	565.14	Upward	565.19	Upward
Lower	MW-9	565.66		565.47		565.19		565.05		565.50		565.47	

Monitoring Location		12/31/2013		01/30/2014		2/26/2014		3/28/2014		4/25/2014		5/29/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	561.39	Upward	559.88	Upward	570.48	Downward	559.36	Upward	560.21	Upward	559.12	Upward
Lower	MW-6	564.74		564.14		565.29		564.01		564.74		564.71	
Upper	MH8	562.86	Upward	562.41	Downward	562.81	Downward	562.21	Downward	563.03	Downward	563.20	Upward
Lower	MW-7	563.09		562.40		562.78		562.01		562.95		563.21	
Upper	MH11	563.53	Upward	563.40	Upward	563.28	Upward	563.58	Upward	563.90	Upward	564.01	Upward
Lower	MW-8	564.06		563.95		563.83		564.10		564.44		564.37	
Average [1]		565.42	Upward	565.18	Upward	565.22	Upward	565.61	Upward	565.87	Upward	565.71	Upward
Lower	MW-9	565.76		565.52		565.46		565.93		566.12		565.77	

Table 2.4

Summary of Vertical Gradients
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location		06/25/2014		07/29/2014		08/26/2014		09/30/2014		10/29/2014		11/25/2014	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	560.62	Upward	560.42	Upward	561.12	Upward	560.65	Upward	559.77	Upward	560.70	Upward
Lower	MW-6	564.46		564.28		564.26		564.07		564.09		563.89	
Upper	MH8	562.88	Upward	562.72	Upward	562.58	Downward	562.51	Downward	562.54	Downward	562.09	Downward
Lower	MW-7	562.94		562.84		562.49		562.36		562.35		561.92	
Upper	MH11	563.53	Upward	563.41	Upward	563.11	Upward	562.89	Upward	562.78	Upward	562.71	Upward
Lower	MW-8	564.03		563.75		563.61		563.31		563.23		563.18	
Average [1]		565.33	Upward	564.94	Upward	564.91	Upward	564.67	Upward	564.54	Upward	564.56	Upward
Lower	MW-9	565.60		565.21		565.20		564.89		564.77		564.76	

Monitoring Location		12/30/2014		01/28/2015		2/24/2015		3/25/2015		4/23/2015		5/29/2015	
		Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction	Water Level (ft amsl)	Gradient Direction
Upper	MH3	571.05	Downward	565.06	Downward	565.39	Downward	560.93	Upward	560.48	Upward	561.40	Upward
Lower	MW-6	564.53		564.82		565.18		565.07		565.89		564.58	
Upper	MH8	562.31	Downward	563.96	Upward	NM	NA	563.76	Upward	564.85	Upward	563.26	Upward
Lower	MW-7	562.20		564.72		565.17		564.14		565.34		563.59	
Upper	MH11	562.98	Upward	564.19	Upward	NM	NA	563.88	Upward	564.86	Upward	563.36	Upward
Lower	MW-8	563.43		564.70		565.15		564.44		565.41		563.93	
Average [1]		564.86	Upward	565.03	Downward	NM	NA	NM	NA	566.11	Upward	565.30	Upward
Lower	MW-9	565.13		564.26		565.41		566.11		566.41		565.56	

Notes:

NA - Not Applicable.
NM - Not monitored.
(1) - Distance weighted for MH14 (two thirds) and MH15 (one third).
(2) - Buried with snow.
(3) - Not Monitored - MH14 was buried with snow and could not be accessed.

Table 2.5

Groundwater Sampling Summary
Operation and Maintenance Manual
Gratwick-Riverside Park Site
North Tonawanda, New York

LOCATIONS

OGC1	MW-6
OGC2	MW-7
OGC3	MW-8
OGC4	MW-9
OGC5	OGC6
OGC7	OGC8

FREQUENCY

- quarterly for 2 years following GWS startup.
- semi-annually for Year 3 except for OGC-4 (quarterly for SVOCs) and OGC-6 (quarterly for VOCs).
- annually for Years 4 through 7 (until May 2008).

SAMPLING PROGRAM (MAY 2009 THROUGH MAY 2012)

Annual	***Once Every 2 Years (2010 and 2012)***
MW-8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-4	OGC-2
OGC-6	OGC-5
OGC-7	
OGC-8	

SAMPLING PROGRAM (MAY 2013 THROUGH MAY 2017)

Annual	***Once Every 2 Years (2014 and 2016)***
MW-8	MW-6
MW-9	MW-7
OGC-3	OGC-1
OGC-6	OGC-2
OGC-7	OGC-4
	OGC-5
	OGC-8

PARAMETERS

Volatiles

Acetone	Methylene Chloride
Benzene	Tetrachloroethene
2-Butanone	Toluene
Chlorobenzene	Trichloroethene
1,1-Dichloroethane	Vinyl Chloride
trans-1,2-Dichloroethene	Xylenes (Total)
Ethylbenzene	

Semi-Volatiles

1,2-Dichlorobenzene	4-Methylphenol
1,4-Dichlorobenzene	Naphthalene
2,4-Dimethylphenol	Di-n-octylphthalate
2-Methylphenol	Phenol

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-9												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	9.4J	4.3J	7.3J/6.7J		4.2J	7.0/7.2			13/12			17	17
Benzene	1		0.24J	0.39J/0.35J		0.44J	0.29J/0.30J	0.29J/0.29J		0.40J/ND0.70				0.54J
2-Butanone	50													2.6J
Chlorobenzene	5		0.50J	0.86J/0.85J		1.3		1.0/1.1		0.91J/0.87J		1.1	1.7	1.5
trans-1,2-Dichloroethene	5			0.22J/ND		0.31J	0.24J/0.24J	0.22J/0.20J						0.42J
Ethylbenzene	5		0.30J	0.46J/0.42J		0.73J	0.44J/0.42J	0.46J/0.46J		0.40J/0.38J				0.83J
Methylene Chloride	5		0.34J	0.33J/ND	4.0J	0.53J						7.2	1.6	
Tetrachloroethene	5	1.6J	1.1J	1.0J/0.92J		1.6	0.92J/0.80J	0.77J/0.74J		0.67J/0.71J				0.57J
Toluene	5		1.6J	3.0J/2.5J	2.8J	2.7	2.1/2.0	2.7/2.7	2.0	2.0/1.9	4.6	3.2	2.6	
Trichloroethene	5	2.2J	1.8J	2.4J/2.2J	3.0J	4.4	2.0/2.0	2.2/2.3		1.8/1.8	9.5	4.9	3.0	1.8
Vinyl Chloride	2									1.7/1.7			3.6	4.0
Total Xylenes	5		1.0J	1.5J/1.5J		2.5J	1.3J/1.3J	1.4J/1.4J		0.98J/1.0J	3.0			2.0J
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*				0.6J									
1,4-Dichlorobenzene	3*												2J	
2,4-Dimethylphenol	50	12	12	18/17	38		20/22	30/34	30	35/36	36	42	50	58
2-Methylphenol	NL	1J	3J	3J/3J	7J		4J/4J	6J/6J	6J	6J/6J	6J	5J	8J	8J
4-Methylphenol	NL	69	110	97/92	230		100/110	190/230	150	130/130	160	190	260	190
Naphthalene	10													
Di-n-octyl phthalate	50													
Phenol	1	3J	34	28/22	24		38/41	34/35	42	46/46	180	30	27	49

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-9								
Date		**05/25/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50		5.7	4.8J	5.9	4.3J			6.2	
Benzene	1			0.76		0.53J	0.44J	0.62J	0.57J	
2-Butanone	50									
Chlorobenzene	5	2.8	1.4	5.3	2.5	2.4	2.3	2.5	3.1	
trans-1,2-Dichloroethene	5		0.55J	0.74J						
Ethylbenzene	5			1.2	0.82J	1.1	0.74J	1.0	0.97J	
Methylene Chloride	5									
Tetrachloroethene	5			0.82J	0.57J	0.66J	0.54J		0.66J	
Toluene	5	3.1	2.4	3.8	3.8	4.3	3.5	4.4	4.6	5.3J
Trichloroethene	5	2.9	1.7	4.7	2.6	2.7	2.3	3.0	3	
Vinyl Chloride	2			4.2		1.4				
Total Xylenes	5			3.3	2.2J	2.7	1.5J	2.7	2.6	
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*	0.9J	0.7J		1.4J	1.0J	1.1J	0.98J	1.6J	1.2J
1,4-Dichlorobenzene	3*	3J	1J	2.3J	1.7J	1.6J	1.8J	1.5J	2.3J	0.48J
2,4-Dimethylphenol	50	46	31	110	41	43	47	82J	76J	62J
2-Methylphenol	NL	6	6	12	9.9J	11	11	12	13J	13
4-Methylphenol	NL	170	96	300	180	230	230	280	0.75J	200
Naphthalene	10	0.2J	0.5J							
Di-n-octyl phthalate	50									
Phenol	1	11	13	20	20	17	9.3J	16	26	16

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-4														
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**3/04/04**	**05/14/04**	**11/23/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**											NA		NA		
Acetone	50			7.9J			4.0J									
Benzene	1		0.21J	0.2J												
2-Butanone	50															
Chlorobenzene	5		0.49J	0.66J		0.83J/0.79J		0.46J		0.83J						
trans-1,2-Dichloroethene	5			0.22J												
Ethylbenzene	5		0.41J	0.39J		0.54J/0.53J	0.48J	0.39J		0.77J						0.44J
Methylene Chloride	5				5.1J/4.9J								4.6		2.0	
Tetrachloroethene	5	1.0J	1.2J	0.87J		0.86J/0.84J	1.1	0.78J		0.77J						
Toluene	5			1.0J		1.0/0.98J	1.4	0.72J		1.2						
Trichloroethene	5	1.6J	1.4J	1.5J		1.5/1.4	1.7	0.96J		1.5						0.53J
Vinyl Chloride	2															
Total Xylenes	5		1.0J	0.94J		0.84J/0.82J	1.1J			0.95J						
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50	8J	12	6J	8J/6J	7J/7J	8J		7J/7J	8J	4J	6J		4J		
2-Methylphenol	NL	0.9J	2J	35	2J/ND	1J/2J	2J			3J		3J		2J		
4-Methylphenol	NL	64	86	40	58/55	61/67	68		69/68	73	32	55		31	14	15
Naphthalene	10															
Di-n-octyl phthalate	50															
Phenol	1	310	560	400	420/460	710/1100	1100	1100	2400/2300	1800	1600		2400	1500	850	510

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**OGC-4**						
Date		**05/25/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**							
Acetone	50			1.6J				
Benzene	1							
2-Butanone	50							
Chlorobenzene	5							
trans-1,2-Dichloroethene	5							
Ethylbenzene	5							
Methylene Chloride	5							
Tetrachloroethene	5							
Toluene	5							
Trichloroethene	5							
Vinyl Chloride	2							
Total Xylenes	5							
Semi-Volatiles (µg/L)								
1,2-Dichlorobenzene	3*							
1,4-Dichlorobenzene	3*							
2,4-Dimethylphenol	50		0.9J		0.51J/ND			
2-Methylphenol	NL		0.5J	2.7J				
4-Methylphenol	NL	3J	6				2.8J	0.87J
Naphthalene	10		0.5J		3.4J/3.4J			
Di-n-octyl phthalate	50							
Phenol	1	84	66	25	15/15	5.5	0.97J	0.68J

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-8												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**05/08/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	78	31/29	19J		4.7J	3.6J				6.2	5.8	4.7J	
Benzene	1	11	14/14	14		2.6	5.3	3.3	3.6	3.1	1.8	1.2	1.1	0.92
2-Butanone	50	4.0J												
Chlorobenzene	5	3.7J	4.1J/4.1J	4.0J		0.87J	1.7	1.1		1.1	0.65J	0.48J	0.43J	0.44J
trans-1,2-Dichloroethene	5	4.3J	3.2J/3.1J	4.0J		0.76J	1.5	0.88J		1.0	0.50J	0.41J	1.0	
Ethylbenzene	5	13	16/16	15	1.6J	2.8	5.8	3.1	3.9	3.1	1.8	1.2		0.99J
Methylene Chloride	5		0.52J/0.48J	0.62J	1.8J									
Tetrachloroethene	5	40	51/52	59	7.7J	9.9	22	12	14	11	7.0	5.0	3.8	4.0
Toluene	5	140	140/140	110	17J	21	53	28	38	27	16	11	8.1	8.3
Trichloroethene	5	120	110/110	110	20J	22	53	27	35	27	17		7.7	7.6
Vinyl Chloride	2	3.7J	3.4/3.6	3.1	1.1J		1.4	0.70J		0.78J				
Total Xylenes	5	43	55/54	46	4.8J	8.3	18	9.5	11	9.9	5.4	3.7	3.0	3.2
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*													
1,4-Dichlorobenzene	3*													
2,4-Dimethylphenol	50	2J	4J/2J	4J	0.8J	0.8J	3J	1J						
2-Methylphenol	NL	18	30/25	16	4J	5J	13	7J	11	7J	4J	2J	2J	3J
4-Methylphenol	NL	30	51/45	28	8J	10	26	14	20	14J	9	5J	6J	8J
Naphthalene	10	1J	3J/25	1J			0.9J							
Di-n-octyl phthalate	50		0.1J/ND											
Phenol	1	30	49/44	31	5J	8J	11	10		4J	6J	2J		

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**OGC-8**						
Date		**05/24/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**							
Acetone	50		9.9	1.5J				
Benzene	1	0.54J	0.84	0.58J				0.50J
2-Butanone	50							
Chlorobenzene	5							
trans-1,2-Dichloroethene	5							
Ethylbenzene	5	0.53J	0.84J	0.50J				
Methylene Chloride	5							
Tetrachloroethene	5	2.0	2.3	1.6		0.94J	1.3	0.91J
Toluene	5	4.0	6.4	3.7		2.4	2.6	2.8
Trichloroethene	5	4.0	6.5	4.0		2.4	2.7	3.1
Vinyl Chloride	2							
Total Xylenes	5	1.1J	2.5J	1.5J		0.82J	0.86J	0.78J
Semi-Volatiles (µg/L)								
1,2-Dichlorobenzene	3*							
1,4-Dichlorobenzene	3*		0.2J					
2,4-Dimethylphenol	50		1J		0.73J		0.52J	1.1J
2-Methylphenol	NL	2J	2J		2.2J	1.5J	2.0J	2.6J
4-Methylphenol	NL	6	8	5.7	6.5J	5.3J	6.2J	
Naphthalene	10							
Di-n-octyl phthalate	50							
Phenol	1							

Notes:

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NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		River South														
Date		**05/18/01**	**09/17/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**	**05/24/07**	**05/29/08**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50						3.0J						3.2J			12
Benzene	1										0.42J					
2-Butanone	50												3.9J			3.1J
Chlorobenzene	5															
trans-1,2-Dichloroethene	5															
Ethylbenzene	5															
Methylene Chloride	5															
Tetrachloroethene	5						0.30J									
Toluene	5			0.29J			0.72J	0.35J			1.8					
Trichloroethene	5						0.44J									
Vinyl Chloride	2						0.27J									
Total Xylenes	5										1.8J					
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50															
2-Methylphenol	NL															
4-Methylphenol	NL															
Naphthalene	10															
Di-n-octyl phthalate	50															
Phenol	1															

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-8												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	52	12J	11J	75J	67	20			73		28/33	26	16
Benzene	1	6.5	4.3	4.1		8.6	12	12	8.1	12	23/24	10/12	4.2	4.4
2-Butanone	50													
Chlorobenzene	5	1.8J	1.0J	1.0J		3.2	4.9	4.4	3.6	6.2	6.0/6.4	2.7/3.3	2.4	2.4
trans-1,2-Dichloroethene	5	2.2J	1.8J	2.9J	4.8J	7.3	11	16	12	13	10/12	7.3/9.4	7.4	5.3
Ethylbenzene	5	5.7	3.7J	4.4J	8.2J	12	18	18	15	23	30/32	20/24	4.6	5.8
Methylene Chloride	5	1.1J	0.58J	0.66J	4.4J	1.2	1.4	1.6		1.3	2.2/2.2	7.3/9.2	1.7	0.64J
Tetrachloroethene	5	21	12	9.8	23J	32	61	58	54	80	91/100	120/130	62	71
Toluene	5	75	36	31	80	100	140	160	100	120	240/240	97/120	30	33
Trichloroethene	5	82	40	35	110	180	320	280	210	320	460/460	380/390	180	150
Vinyl Chloride	2	5.2	1.6J	3.3	23	12	18	14	12	18	21/21	13/16	5.8	5.1
Total Xylenes	5	22	13	16	30J	40	68	69	58	93	120/120	92/110	32	25
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*				2J	2J		2J		4J	3J/3J			
1,4-Dichlorobenzene	3*			0.6J	2J	1J	1J	2J		4J	3J/3J	19U/2J	4J	5J
2,4-Dimethylphenol	50	1J	11	16	19	18	15	27	20	27	37/38	15J/14	7J	6J
2-Methylphenol	NL	33	55	41	48	44	38	56	37	35	45/46	18J/18	18J	16
4-Methylphenol	NL	10	32	34	55	60	59	83	64	75	130/130	34/31		
Naphthalene	10				0.7J	0.8J	0.8J	1J			2J/2J			
Di-n-octyl phthalate	50													
Phenol	1	43	130	140	85	110	91	110	140	78	80/80	28/28	11J	4J

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compunds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-8								
Date		**05/24/07**	**05/29/08**	**05/29/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50	6.6/7.5	23	2.6J		3.1J				
Benzene	1	1.6/1.5	1.5	2.7		2.7	2.1	2.5	3.5	2.8J/2.9J
2-Butanone	50		4.4J							
Chlorobenzene	5	0.84J/0.82J	0.54J	0.99J		3.8	3.4	3.4	7.0	4.6J/4.8J
trans-1,2-Dichloroethene	5	4.4/3.9	3.6	6.8		3.5	3.4	3.4	6.5	5.3/6.1
Ethylbenzene	5	2.5/2.2	1.8	4.2		5.2	4.4	4.4	6.2	3.9J/3.9J
Methylene Chloride	5									
Tetrachloroethene	5	16/14	9.5	12		12	7.7	5.3	3.5	2.9J/2.8J
Toluene	5	12/11	10	26		18	6.5	6.5	4.9	4.0J/4.1J
Trichloroethene	5	40/36	29	68		34	22	21	22	17/17
Vinyl Chloride	2					3.0				
Total Xylenes	5	9.8/9.1	6.7	19		22	16	12	11	5.4J/5.0J
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*		0.4J		1.5J	1.2J	1.3J	0.87J	1.7J	1.2J/0.91J
1,4-Dichlorobenzene	3*	0.5J/0.4J	0.5J		2.1J	3.3J	6.9J	7.1J	21	12/11
2,4-Dimethylphenol	50	0.8J/0.6J	14	14	13	14	16	17	19	18/16
2-Methylphenol	NL	7/7	26	32	22	16	20	16	23	21/19
4-Methylphenol	NL	18/16	31	29	38	41J	30	25	1.0J	27/24
Naphthalene	10	22/22	1J							
Di-n-octyl phthalate	50									
Phenol	1	20/21	32	15	13	3.4J	4.0J	2.5J	4.5J	3.3J/2.7J

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-3												
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	13J / 19J	3.8J	15J		7.1	6.7			5.6			10/8.4	2.8J
Benzene	1	1.6J / 1.6J	1.6	1.8		1.8	1.2	1.5		1.6	1.4		1.2/1.1	0.93J
2-Butanone	50													
Chlorobenzene	5		0.24J	0.28J		0.28J		0.22J						
trans-1,2-Dichloroethene	5	1.6J / 1.6J	1.0J	1.4J	1.1J	1.1	0.98J	0.44J		1.0				
Ethylbenzene	5	1.6J / 1.5J	2.0J	2.3J	1.5J	2.4	1.7	1.8		2.0			1.4/1.3	1.1
Methylene Chloride	5				1.9J							6.3	1.2/1.0	
Tetrachloroethene	5	2.4J / 2.2J	3.0J	2.2J	1.7J	2.2	1.8	1.8		1.5			0.71J/0.63J	0.61J
Toluene	5	5.7 / 5.1	5.9	5.3		5.1	3.7	4.6	4.0	4.3	3.6	2.6	2.6/2.4	
Trichloroethene	5	20 / 20	18	19	14J	17	14	13	12	14	9.8	7.7	6.4/6.1	5.6
Vinyl Chloride	2	ND / 1.0J	0.4	0.72						0.62J				
Total Xylenes	5	5.6J / 5.4J	7.5	8.7	4.8J	7.8	5.8	5.8	5.0	6.6	3.9		3.3/3.0	2.9J
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*				1J									
1,4-Dichlorobenzene	3*				0.7J		0.5J							
2,4-Dimethylphenol	50	5J / 5J	9	8J	11	11	7J	8J	11	12	10	9J	8J/4J	6J
2-Methylphenol	NL	98 / 96	120	87	160	140	100	100	120	140	150	110	83/73	64
4-Methylphenol	NL	13 / 13	21	17	28	23	14	15	22	23	20	17	14/12	13
Naphthalene	10													
Di-n-octyl phthalate	50													
Phenol	1	120 / 110	140	130J	210	140	85	92	110	120	120	90	78/74	75

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-3								
Date		**05/24/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50	0.76	6.0	2.9J/2.6J		3.7J			3.1J	
Benzene	1		0.93	0.75/0.78		0.67J	0.45J	0.64J/0.71	5.3J	
2-Butanone	50									
Chlorobenzene	5									
trans-1,2-Dichloroethene	5									
Ethylbenzene	5	0.85J	0.92J	0.69J/0.73J		0.75J				
Methylene Chloride	5									
Tetrachloroethene	5	0.56J								
Toluene	5	1.7	1.8	1.4/1.4		1.2	0.88J	1.2/1.3	1.2J	
Trichloroethene	5	4.3	4.9	3.3/3.5		2.5	1.8	2.6/2.5	0.48J	
Vinyl Chloride	2								62J	
Total Xylenes	5	2.1J	2.3J	1.7J/1.7J		1.0J	0.71J	0.81J/0.77J	13	
									200	
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*	0.6J	0.7J		0.86J	0.40J	0.61J	0.46J/0.49J	16	0.47J
1,4-Dichlorobenzene	3*		0.6J		0.58J					
2,4-Dimethylphenol	50		6	6.2/5.9	4.3J	3.7J	5.8J	4.8J/4.8J	4.8J	4.1J
2-Methylphenol	NL	47	45	44/43	36	33	35	31/32	34	23
4-Methylphenol	NL	10	11	11/11	9.9	10	11	9.1J/9.5J	0.91J	7.6J
Naphthalene	10		0.8J							
Di-n-octyl phthalate	50									
Phenol	1	60	65	60/57	50	48	53	58/57	52	44J

Blank = Non-Detect

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		GW-5S		OGC-7												
Date		**12/17/87**	**08/12/88**	**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50	293		21J	0.25J	8.2J			3.6J							
Benzene	1	2				0.30J		0.28J	0.20J	0.26J				0.34J	0.34J	
2-Butanone	50	27														
Chlorobenzene	5															
trans-1,2-Dichloroethene	5	180	89	6.3	3.1J	5.4	4.9J	4.8J	4.2	4.7	4.0	5.4	5.0	5.9	4.9	5.8
Ethylbenzene	5	9	7J	1.1J	0.80J	1.0J		1.3	0.84J	0.91J		1.4	0.93J	1.5	1.4	1.3
Methylene Chloride	5	1														
Tetrachloroethene	5	11	7J	4.3J	3.6J	3.4J	2.9J	4.0	3.4	2.7	2.8	4.1	2.2	4.1	2.9	2.8
Toluene	5	75	49	12	5.8	6.7	5.7J	6.9	5.2	6.0	6.7	8.6	5.8	9.3	8.3	8.6
Trichloroethene	5	287	220	70	40	48	45	68	44	38	50	56	38	56	37J	37
Vinyl Chloride	2	7	4J	2.6J	0.84	1.7J	3.5J	2.2	1.8	1.8		2.3	2	2.9	3.0	2.9
Total Xylenes	5	54	37	6.0J	4.8J	6.5	3.9J	7.6	5.3	5.3	5.5	8.7	5.4	10	8.6	8.2
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*			2J												
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50	10		11				2J								
2-Methylphenol	NL	24		24	3J		2J		1.0J		0.8J		1J			
4-Methylphenol	NL	38							0.9J		0.7J		1J			
Naphthalene	10															
Di-n-octyl phthalate	50										0.6J					
Phenol	1	61	92	4J		0.7J										

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-7							
Date		**05/24/07**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/15**
Volatiles (µg/L)	**Class GA Level**								
Acetone	50								
Benzene	1								
2-Butanone	50								
Chlorobenzene	5								
trans-1,2-Dichloroethene	5	3.8		2.7	2.7	2.0	2.0	1.7	
Ethylbenzene	5	0.87J	0.84J	0.62J					
Methylene Chloride	5								
Tetrachloroethene	5	1.7	1.2J	0.80J	0.72J	0.69J	0.43J	0.50J	0.38J
Toluene	5	5.0	4.9J	3.3	3.4	2.4	2.6	2.5	1.9
Trichloroethene	5	22	21J	14	12	7.7	9.7	8.5	5.1
Vinyl Chloride	2		2.6J		2.4	1.6		1.7	0.94J
Total Xylenes	5	5.3	5.0J	3.6	4.0	2.8	2.9	2.8	0.95J
Semi-Volatiles (µg/L)									
1,2-Dichlorobenzene	3*								
1,4-Dichlorobenzene	3*								
2,4-Dimethylphenol	50								
2-Methylphenol	NL	0.6J	0.5J		0.45J		0.38J	0.52J	
4-Methylphenol	NL	0.6J	0.4J					1.1J	
Naphthalene	10								
Di-n-octyl phthalate	50								
Phenol	1								

Blank = Non-Detect

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**River Middle**														
Date		**05/18/01**	**09/17/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/31/06**	**05/24/07**	**05/29/08**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50						3.1J									2.8J
Benzene	1															
2-Butanone	50															
Chlorobenzene	5															
trans-1,2-Dichloroethene	5															
Ethylbenzene	5															
Methylene Chloride	5															
Tetrachloroethene	5														1.3	
Toluene	5															
Trichloroethene	5							0.21J								
Vinyl Chloride	2															
Total Xylenes	5															
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50															
2-Methylphenol	NL															
4-Methylphenol	NL															
Naphthalene	10															
Di-n-octyl phthalate	50							0.7J								
Phenol	1															

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-7														
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/31/06**	**05/24/07**	**05/29/08**	**05/26/10**
Volatiles (µg/L)	**Class GA Level**																
Acetone	50	5.7J		6.5J		4.3J	5.4			4.8			4.3J	3.0J	3.9J	3.3J/3.4J	
Benzene	1		1.9	2.0		2.0	1.3	1.8		0.90			0.58J				
2-Butanone	50																
Chlorobenzene	5																
trans-1,2-Dichloroethene	5		0.82J	1.1J		0.98J	0.89J	1					0.36J				
Ethylbenzene	5		0.85J	0.81J		1.0	0.61J	0.75J					0.32J				
Methylene Chloride	5				1.6J												
Tetrachloroethene	5			0.27J													
Toluene	5		3.5J	3.6J		3.3	1.9	3		1.1	2.8		0.93J				
Trichloroethene	5		0.55J	0.63J		0.43J	0.45J	0.36J									
Vinyl Chloride	2		1.6J	2.0	3.8J	2.9	1.7	2.2		1.3			0.80J			0.64J/0.61J	
Total Xylenes	5		2.1J	2.1J		2.7J	1.5J	1.9J		0.76J							
Semi-Volatiles (µg/L)																	
1,2-Dichlorobenzene	3*																
1,4-Dichlorobenzene	3*																
2,4-Dimethylphenol	50			2J	2J	3J	0.7J	2J									
2-Methylphenol	NL		3J	2J	4J	6J	1J	2J			2J					0.4J/0.5J	
4-Methylphenol	NL		3J	2J	4J	6J	1J	2J			1J				0.3J	0.5J/0.6J	
Naphthalene	10																
Di-n-octyl phthalate	50				0.6J												
Phenol	1		24	7J	10	26	2J	6J		5J	2J		1J				

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**MW-7**	
Date		**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**		
Acetone	50		
Benzene	1		
2-Butanone	50		
Chlorobenzene	5		
trans-1,2-Dichloroethene	5		
Ethylbenzene	5		
Methylene Chloride	5		
Tetrachloroethene	5		
Toluene	5		
Trichloroethene	5		
Vinyl Chloride	2		
Total Xylenes	5		
Semi-Volatiles (µg/L)			
1,2-Dichlorobenzene	3*		
1,4-Dichlorobenzene	3*		
2,4-Dimethylphenol	50		
2-Methylphenol	NL		
4-Methylphenol	NL		0.65J
Naphthalene	10		
Di-n-octyl phthalate	50		
Phenol	1		

Blank = Non-Detect

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-2														
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**	**05/25/07**	**05/29/08**	**05/26/10**
Volatiles (µg/L)	**Class GA Level**																
Acetone	50			11J			3.0J					4.5J	3.1				
Benzene	1																
2-Butanone	50																
Chlorobenzene	5																
trans-1,2-Dichloroethene	5																
Ethylbenzene	5																
Methylene Chloride	5				1.7J												
Tetrachloroethene	5																
Toluene	5										0.37J						
Trichloroethene	5		0.39J														
Vinyl Chloride	2			0.26J		0.25J	0.26J										
Total Xylenes	5																
Semi-Volatiles (µg/L)																	
1,2-Dichlorobenzene	3*																
1,4-Dichlorobenzene	3*																
2,4-Dimethylphenol	50																
2-Methylphenol	NL																
4-Methylphenol	NL																
Naphthalene	10																
Di-n-octyl phthalate	50																
Phenol	1																

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**OGC-2**	
Date		**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**		
Acetone	50		
Benzene	1		
2-Butanone	50		
Chlorobenzene	5		
trans-1,2-Dichloroethene	5		
Ethylbenzene	5		
Methylene Chloride	5		
Tetrachloroethene	5		
Toluene	5		
Trichloroethene	5		
Vinyl Chloride	2		
Total Xylenes	5		
Semi-Volatiles (µg/L)			
1,2-Dichlorobenzene	3*		
1,4-Dichlorobenzene	3*		
2,4-Dimethylphenol	50		
2-Methylphenol	NL		
4-Methylphenol	NL		0.79J
Naphthalene	10		
Di-n-octyl phthalate	50		
Phenol	1		

Blank = Non-Detect

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-6													
Date		**05/18/01**	**08/20/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**03/04/04**	**05/14/04**	**11/23/04**	**05/27/05**	**05/31/06**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50			6.6J			5.0			3.7J						8.6/8.7
Benzene	1									0.71	0.87	1.4		2.5	5.2	12/12
2-Butanone	50															
Chlorobenzene	5															
trans-1,2-Dichloroethene	5			0.23J	0.23J	0.37J	0.45J	0.55J		1.4	2.0	2.1		3.6	5.3	11/12
Ethylbenzene	5					0.31J				0.85J	1.1	2.0	3.3	3.1	7.4	20/20
Methylene Chloride	5				2.1J								4.4	2.5	2.2	
Tetrachloroethene	5		1.4J	0.73J		6.6	7.4	5	12	49	51	230	300	260	550	2000/2100
Toluene	5			0.55J		2.0	1.6	1.5	2.4	9.3	12	27	40	35	72	240/260
Trichloroethene	5	3.0J	4.7J	3.1J	5.9	16	19	13	26	95	120	330	530	330	610	1800/1800
Vinyl Chloride	2					0.22J	0.25J			0.45J						2.9/2.8
Total Xylenes	5		0.22J	0.53J	0.26J	1.7J	1.2J	1.0J		4.1	4.7	8.6	13	12	28	79/76
Semi-Volatiles (µg/L)												NA		NA		
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*															
2,4-Dimethylphenol	50							1J								
2-Methylphenol	NL		2J	2J	32	11	8J	9J	13	22	27		63		85	89/110
4-Methylphenol	NL			1J	0.02J	10							1J		2J	84/100
Naphthalene	10															1J/2J
Di-n-octyl phthalate	50															
Phenol	1		7J	2J	4J	5J	3J	2J		5J	3J		9J		8J	13/16

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-6								
Date		**05/24/07**	**05/29/08**	**05/27/09**	**05/26/10**	**05/26/11**	**05/30/12**	**05/24/13**	**05/29/14**	**05/29/2015**
Volatiles (µg/L)	**Class GA Level**									
Acetone	50			1.6J						
Benzene	1	7.2		3.2	3.6	1.8	1.9	4.7	1.3/1.4	
2-Butanone	50									
Chlorobenzene	5									
trans-1,2-Dichloroethene	5	7.1		4.4	8.2	7.6	4.8	7.3	4.5/4.6	
Ethylbenzene	5	12		4.8	5.2	2.4	2.0	4.8	1.2/1.2	
Methylene Chloride	5									
Tetrachloroethene	5	1400	34	400	640	220	100	1100	190/190	180
Toluene	5	97	2.9	34	38	14	16	57	10/10	8.1J
Trichloroethene	5	1100	31	320	410	180	92	460	100/110	99
Vinyl Chloride	2	1.5			1.2					
Total Xylenes	5	46		18	20	9.1	8.9	21	5.1/5.1	
Semi-Volatiles (µg/L)										
1,2-Dichlorobenzene	3*									
1,4-Dichlorobenzene	3*									
2,4-Dimethylphenol	50		0.9J						0.54J/0.59J	
2-Methylphenol	NL	76	76	32	32	15	16	23	9.4J/9.3	4.8J
4-Methylphenol	NL	2J	70	1.1J	1.4J	1.2J	1.1J	1.1J		0.88J
Naphthalene	10	2J	2J	1.2J	1.4J	1.1J	1.1J	1.2J	1.1J/1.1J	0.89J
Di-n-octyl phthalate	50									
Phenol	1	8	8				1.5J	57	1.2J/1.2J	0.71J

Blank = Non-Detect

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		River North												
Date		**05/18/01**	**09/17/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**	**05/31/07**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50						2.4J		NS			3.6J	3.6J		
Benzene	1					0.21J					2.0	0.39J			
2-Butanone	50														
Chlorobenzene	5					1.3						3.2			
trans-1,2-Dichloroethene	5					0.25J						1.0			
Ethylbenzene	5					20						40		2.9	
Methylene Chloride	5				1.6J										
Tetrachloroethene	5					3.8						7.7		1.3	
Toluene	5			0.39J		63				0.96J		130	2.2	14	
Trichloroethene	5			0.35J		4.5						6.4		0.59J	
Vinyl Chloride	2					3.7						9.3			
Total Xylenes	5					80				0.96J		210	3.7	23	
Semi-Volatiles (µg/L)															
1,2-Dichlorobenzene	3*														
1,4-Dichlorobenzene	3*														
2,4-Dimethylphenol	50										1J				
2-Methylphenol	NL														
4-Methylphenol	NL														
Naphthalene	10														
Di-n-octyl phthalate	50														
Phenol	1														

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-5											
Date		**05/20/01**	**08/21/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**													
Acetone	50	38J		11J			6.4			4.9J		0.61J		3.0J
Benzene	1		1.5	1.4		0.87	0.92	0.87		0.77				0.67J
2-Butanone	50													
Chlorobenzene	5													
trans-1,2-Dichloroethene	5		0.65J	0.76J		0.42J	0.57J	0.52J				0.34J		
Ethylbenzene	5		0.21J	0.23J										
Methylene Chloride	5				3.4J								2.4	
Tetrachloroethene	5		0.38J	0.27J										
Toluene	5		2.5J	2.2J		0.99J	0.87J	1.2		0.80J		0.80J		
Trichloroethene	5		0.87J	0.66J		0.36J	0.41J	0.40J				0.28J		
Vinyl Chloride	2		1.6J	1.2J		1.1	1.5	1.2		1.1		1.4		1.2
Total Xylenes	5		1.0J	1.0J		0.67J	0.37J	0.40J				1.0J		
Semi-Volatiles (µg/L)														
1,2-Dichlorobenzene	3*													
1,4-Dichlorobenzene	3*													
2,4-Dimethylphenol	50		8J	6J	5J			1J						6J
2-Methylphenol	NL		1J	1J	1J									
4-Methylphenol	NL		2J	5J	4J									2J
Naphthalene	10		1J	1J				0.5J						1J
Di-n-octyl phthalate	50			1J	0.8J									
Phenol	1		0.9J											

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		**OGC-5**				
Date		**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**					
Acetone	50		3.5J			
Benzene	1	0.54J	0.69J		0.58J	1.1
2-Butanone	50					
Chlorobenzene	5					
trans-1,2-Dichloroethene	5					
Ethylbenzene	5					
Methylene Chloride	5					
Tetrachloroethene	5					
Toluene	5					
Trichloroethene	5					
Vinyl Chloride	2	0.95J	1.4			
Total Xylenes	5					
Semi-Volatiles (µg/L)						
1,2-Dichlorobenzene	3*					
1,4-Dichlorobenzene	3*					
2,4-Dimethylphenol	50					
2-Methylphenol	NL	0.5J	0.3J			
4-Methylphenol	NL	0.9J	0.4J			0.66J
Naphthalene	10	2J	0.5J	1.6J	0.85J	1.1J
Di-n-octyl phthalate	50					
Phenol	1					

Blank = Non-Detect

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		GW-6S		MW-6												
Date		**12/15/1987**	**08/10/88**	**05/18/01**	**08/21/01**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/30/06**
Volatiles (µg/L)	**Class GA Level**															
Acetone	50	684	4.9J						4.4J			44		6.7	13	31
Benzene	1	3			0.64J			0.65J	0.59J	0.56J		0.57J				
2-Butanone	50															
Chlorobenzene	5		3.3J		1.5J	1.3J		0.65J		0.54J		0.81J		0.37J		
trans-1,2-Dichloroethene	5	58	4.4J		1.1J			0.37J	0.32J	0.34J		1.4		0.52J		
Ethylbenzene	5	2			0.21J											
Methylene Chloride	5						1.8J								2.1	
Tetrachloroethene	5	43			0.44J							0.67J		0.25J		
Toluene	5	16	3.0J		2.2J	0.29J		1.3	0.91J	1.1		2.1	3.6	0.92J		
Trichloroethene	5	62	5.1J		2.0J		1.2J		1.1	1.5	3.2	14	12	3.7	1.5	1.2
Vinyl Chloride	2	11	1.7J					0.29J	0.24J	0.22J		0.52J				
Total Xylenes	5	7			0.90J	0.44J		0.36J	0.27J							
Semi-Volatiles (µg/L)																
1,2-Dichlorobenzene	3*															
1,4-Dichlorobenzene	3*			1J		0.7J	2J					2J				
2,4-Dimethylphenol	50	5		5J	5J	3J	2J	1J	0.9J	9J		6J				
2-Methylphenol	NL	3		5J	6J	2J	2J	2J	1J	0.9J		5J				
4-Methylphenol	NL	4		15	13	5J	4J	3J	2J	2J		12				1J
Naphthalene	10			67	69		1J		14	13		76			5J	
Di-n-octyl phthalate	50						2J									
Phenol	1	3		14	4J	2J	0.8J					250				2J

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		MW-6				
Date		**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**					
Acetone	50					
Benzene	1					
2-Butanone	50					
Chlorobenzene	5					
trans-1,2-Dichloroethene	5					
Ethylbenzene	5					
Methylene Chloride	5					
Tetrachloroethene	5			0.55J		
Toluene	5			0.73J		
Trichloroethene	5	0.97J		2.3J	0.66J	1.0
Vinyl Chloride	2					
Total Xylenes	5					
Semi-Volatiles (µg/L)						
1,2-Dichlorobenzene	3*			0.66J		
1,4-Dichlorobenzene	3*	0.8J	0.6J	4.2J	2.9J	2.9J
2,4-Dimethylphenol	50			1.4J	1.4J	1.0J
2-Methylphenol	NL	0.5J	0.3J	1.8J	0.71J	1.1J
4-Methylphenol	NL	1J		2.5J	1.3J	1.0J
Naphthalene	10	2J	1J	7.8J	3.9J	
Di-n-octyl phthalate	50					
Phenol	1	0.6J	0.4J	1.9J		4.4J

Notes:

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NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-1												
Date		**05/18/01**	**05/25/07**	**8/21/2001**	**11/27/01**	**02/11/02**	**05/21/02**	**08/06/02**	**11/22/02**	**02/25/03**	**05/08/03**	**11/04/03**	**05/14/04**	**05/27/05**	**05/31/06**
Volatiles (µg/L)	**Class GA Level**														
Acetone	50	20J			11J			4.8J							
Benzene	1			0.64J	0.55J				0.26J						
2-Butanone	50	1.1J													
Chlorobenzene	5	2.2J	2.8	2.0J	1.7J		0.24J		0.78J		0.91J				
trans-1,2-Dichloroethene	5	5.6		3.7J	4.6J	1.8J	0.48J	0.58J	2.7		2.8	0.85J			0.55J
Ethylbenzene	5			0.52J	0.43J				0.21J						
Methylene Chloride	5					1.6J								1.8	
Tetrachloroethene	5			0.78J	0.54J		0.42J	0.53J	0.30J			0.29J			
Toluene	5	5.2	3.1	5.4	4.2J		0.48J	0.43J	1.9	1.7	2.6	0.59J			
Trichloroethene	5	15	2.9	16	11	4.5J	2.2	2.7	6.1	5.1	8.4	2.2	0.47J	1.2	1.9
Vinyl Chloride	2	1.3J		0.51J	0.72J				0.42J		0.64J				
Total Xylenes	5			2.1J	1.6J				0.49J		0.86J				
Semi-Volatiles (µg/L)															
1,2-Dichlorobenzene	3*			0.9J											
1,4-Dichlorobenzene	3*	1J	3J	3J	2J	1J			1J						
2,4-Dimethylphenol	50	9J	46	16	8J	3J		0.6J	9J		4J				
2-Methylphenol	NL	6J	6	12	5J	2J			2J		3J				
4-Methylphenol	NL	20	170	35	15J	5J		1J	5J	6J	8J				2J
Naphthalene	10	71	0.2J	130		21		7J	18		25	3J			
Di-n-octyl phthalate	50														
Phenol	1	150	11	290	57	15	1J	8J	4J		19				

Notes:

* Applies to sum of compounds
NL - Not listed
[ ] Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.6

Summary of Detected Compounds
Site Groundwater and River Water
Gratwick-Riverside Park
North Tonawanda, New York

Location		OGC-1				
Date		**05/24/07**	**05/29/08**	**05/26/10**	**05/30/12**	**05/29/14**
Volatiles (µg/L)	**Class GA Level**					
Acetone	50					
Benzene	1					
2-Butanone	50					
Chlorobenzene	5					
trans-1,2-Dichloroethene	5					
Ethylbenzene	5					
Methylene Chloride	5					
Tetrachloroethene	5					
Toluene	5					
Trichloroethene	5	0.53J	4.2			
Vinyl Chloride	2					
Total Xylenes	5					
Semi-Volatiles (µg/L)						
1,2-Dichlorobenzene	3*					
1,4-Dichlorobenzene	3*					
2,4-Dimethylphenol	50					
2-Methylphenol	NL					
4-Methylphenol	NL		0.4J		0.46J	
Naphthalene	10		0.5J			
Di-n-octyl phthalate	50					
Phenol	1					
					0.97J	

Notes:

* Applies to sum of compounds
NL - Not listed
Exceeds Class GA Level
NS - Not Sampled
J - Estimated
Blank = Non-Detect

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	MH2	MH3	MW-6	OGC-1	OGC-5	MH6	OGC-6	MW-7	MH8	OGC-2
Date										
01/29/10	9.52	9.33	10.04	9.96	9.53	9.91	10.47	10.64	11.11	10.37
02/26/10	9.98	9.79	10.03	10.01	9.55	9.84	10.78	10.28	10.87	10.43
03/30/10	9.48	9.45	9.78	10.06	9.91	9.85	10.68	10.58	10.08	10.76
04/30/10	9.60	9.53	9.82	10.01	9.65	9.94	11.09	11.00	10.91	10.77
05/26/10	9.54	9.84	10.63	9.33	9.27	9.84	11.24	10.60	9.37	10.75
06/28/10	8.46	8.82	9.63	9.51	8.62	9.17	9.86	10.25	9.14	9.44
07/27/10	8.53	8.82	10.88	10.82	9.42	9.77	11.21	11.73	10.75	10.98
08/26/10	10.03	10.89	10.73	10.33	8.73	9.81	11.96	10.51	9.77	10.69
09/28/10	9.94	10.83	10.87	10.38	9.40	10.33	10.61	10.82	10.20	10.97
10/27/10	9.53	9.75	10.56	10.15	9.63	10.02	10.28	10.47	10.31	10.19
11/24/10	9.54	9.90	10.70	10.04	9.24	9.54	10.32	10.09	9.65	9.97
12/28/10	9.48	9.56	10.84	10.37	9.60	10.00	10.42	10.17	9.76	10.33
01/31/11	11.01	10.24	10.53	10.37	9.20	8.72	10.49	10.37	9.80	10.47
02/28/11	9.45	9.33	9.87	9.95	9.56	9.59	10.75	10.11	9.76	10.13
03/30/11	8.72	8.40	10.40	8.65	9.42	8.98	10.56	9.46	9.23	9.51
04/21/11	8.86	8.80	10.80	9.34	9.17	9.80	11.32	10.13	9.40	9.86
05/26/11	8.59	8.50	10.49	9.22	8.95	9.49	11.11	9.80	8.84	9.91
06/22/11	8.91	9.63	10.63	9.07	8.92	9.42	11.21	9.68	9.10	9.00
07/27/11	8.87	9.56	10.94	10.21	8.85	9.32	10.97	10.22	9.08	9.84
08/26/11	8.84	9.51	11.16	10.20	8.87	9.45	11.01	10.34	9.21	9.89
09/27/11	8.61	9.22	10.47	9.74	8.86	9.37	10.60	9.26	9.10	9.51
10/28/11	9.21	9.65	10.60	10.25	9.33	9.77	10.70	9.71	9.33	9.87
11/30/11	9.25	9.93	10.00	9.34	8.24	9.82	10.84	10.46	9.26	9.57
12/29/11	9.24	9.28	10.82	9.80	9.38	9.66	10.91	9.86	9.31	10.02
01/26/12	9.21	8.93	10.84	9.46	9.13	9.36	10.99	10.02	9.06	10.47
02/28/12	9.49	9.33	10.69	9.74	9.51	9.60	11.22	10.49	9.10	10.73
03/29/12	9.75	9.69	10.05	9.97	9.57	9.63	9.93	9.98	9.62	10.13
04/26/12	10.05	11.29	11.22	9.92	9.58	9.59	11.85	10.05	9.14	10.26
05/30/12	10.20	11.54	11.54	10.91	6.33	9.84	11.87	10.24	9.49	9.30
06/27/12	10.20	10.53	10.18	10.23	9.62	9.91	10.55	10.08	9.86	10.19
07/31/12	9.80	11.00	11.34	10.74	9.22	9.42	11.15	11.84	9.56	10.48
08/27/12	9.55	10.69	11.55	10.77	8.56	9.44	10.94	11.89	8.98	10.54
09/24/12	9.50	9.67	10.42	9.89	9.31	9.82	10.31	10.27	9.71	10.29
10/26/12	9.56	9.97	10.14	9.41	9.32	9.90	10.11	10.37	9.77	10.17
11/26/12	9.43	9.59	10.02	9.79	8.87	9.64	10.18	9.63	9.48	9.49
12/26/12	9.79	9.69	10.62	8.78	8.71	9.37	10.05	9.50	9.31	9.42

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	MH2	MH3	MW-6	OGC-1	OGC-5	MH6	OGC-6	MW-7	MH8	OGC-2	MH9
Date											
01/30/13	9.91	8.85	8.45	8.52	8.53	9.07	9.46	8.76	8.76	8.94	
02/27/13	9.14	9.20	9.26	9.30	8.46	8.39	9.97	9.09	8.87	8.91	
03/27/13	10.65	9.01	9.82	8.54	8.30	8.57	9.73	9.01	8.74	8.90	
04/24/13	10.20	8.75	9.32	9.09	8.63	9.06	9.78	9.36	9.74	9.16	
05/24/13	9.44	9.29	10.02	8.49	8.39	8.70	10.49	9.00	8.85	8.94	
06/27/13	8.49	8.74	9.89	8.39	8.63	9.55	10.75	8.66	8.84	9.16	
07/24/13	8.02	8.59	9.75	9.16	8.13	8.73	10.82	9.68	8.43	8.80	
08/22/13	8.99	9.07	10.08	8.83	8.32	8.84	10.58	9.25	8.53	9.26	
09/30/13	8.45	9.48	9.17	8.46	8.20	8.95	10.52	9.24	8.17	9.00	
10/30/13	8.45	10.00	9.68	8.24	8.09	8.83	10.13	8.77	8.05	8.77	
11/27/13	8.70	10.06	10.01	7.99	8.04	8.62	10.38	8.89	8.29	8.90	
12/31/13	9.10	7.45	10.07	8.63	8.23	7.62	10.14	9.52	8.51	9.17	
01/30/14	8.98	8.56	9.97	9.06	8.17	8.52	10.44	9.45	8.89	9.26	
02/26/14	10.35	10.21	10.46	9.12	8.60	9.33	10.34	9.41	8.95	9.24	
03/28/14	8.97	8.54	10.15	9.24	8.43	8.61	10.37	9.24	8.63	9.06	10.33
04/25/14	8.68	8.29	10.19	8.24	8.43	8.68	10.52	8.94	8.57	9.04	10.36
05/29/14	8.81	8.42	10.74	8.76	8.57	9.34	11.23	9.88	9.04	9.81	11.01
06/25/14	8.91	9.25	10.32	8.63	8.62	9.39	10.96	9.52	9.30	9.33	10.99
07/29/14	8.51	8.59	8.75	8.26	7.99	8.35	10.34	9.37	8.18	9.25	10.39
08/26/14	8.27	8.69	8.77	8.64	7.95	8.65	10.35	8.56	8.04	8.94	10.56
09/30/14	8.43	9.64	8.94	8.39	8.26	8.70	10.34	9.22	8.15	9.05	10.66
10/29/14	8.12	9.66	9.80	8.83	8.16	8.87	10.22	9.11	8.29	8.94	10.42
11/25/14	9.11	10.59	9.72	9.19	8.44	8.90	10.84	9.25	8.60	8.80	10.74
12/30/14	10.84	10.75	10.55	9.17	8.83	9.13	10.60	9.69	8.88	9.51	10.98
01/28/15	9.25	7.51	10.18	9.01	8.40	8.65	10.33	9.11	8.63	8.94	5.97
02/24/15	9.28	9.08	10.49	9.63	8.90	9.14	9.93	9.08	NM	9.12	8.14
03/25/15	8.34	8.26	10.59	8.19	8.31	8.70	10.38	9.65	7.63	9.20	9.46
04/23/15	7.87	8.63	8.29	8.46	8.59	8.67	8.11	7.74	7.88	7.69	8.09
05/29/15	7.94	8.01	10.73	8.75	8.10	8.57	10.54	9.24	7.63	9.36	11.11

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	OGC-7	MH11	MW-8	OGC-3	MH12	OGC-8	MH14	MW-9	OGC-4	MH15	MH16
Date											
01/29/10	11.19	11.03	11.58	11.45	10.60	11.62	11.39	10.52	11.29	9.71	9.22
02/26/10	11.30	10.91	11.59	11.74	10.27	11.64	11.32	11.02	11.30	10.62	8.64
03/30/10	11.68	11.74	11.51	12.06	10.62	11.78	11.24	11.49	11.76	10.86	9.14
04/30/10	11.78	11.67	12.11	12.16	10.30	12.15	10.85	11.44	11.92	10.85	9.58
05/26/10	11.81	10.92	11.85	12.14	10.51	11.88	10.14	11.14	11.60	11.10	9.12
06/28/10	10.30	9.26	10.70	10.70	9.18	10.42	8.81	9.90	10.24	8.36	7.48
07/27/10	12.18	10.31	12.76	12.77	10.08	12.31	10.49	11.56	12.03	9.19	8.46
08/26/10	12.23	11.60	11.62	12.37	10.04	11.56	8.17	11.50	11.38	7.52	8.87
09/28/10	12.29	11.89	12.39	12.43	10.21	11.68	10.04	11.24	11.45	7.69	8.48
10/27/10	11.76	11.53	11.81	11.89	9.81	11.65	10.12	11.10	11.39	8.52	9.50
11/24/10	11.67	11.48	11.85	12.08	9.90	11.42	9.97	10.67	11.64	8.12	8.30
12/28/10	11.72	11.17	12.03	12.12	10.17	11.57	9.70	10.91	11.73	8.00	7.87
01/31/11	11.75	11.52	11.27	11.08	9.68	12.36	9.80	11.03	11.53	8.47	10.08
02/28/11	11.68	10.82	11.88	11.96	10.00	12.23	11.12	11.30	11.51	7.93	8.05
03/30/11	11.03	10.46	11.21	11.59	9.71	11.13	9.62	11.00	11.50	8.32	8.11
04/27/11	11.69	9.99	11.78	12.17	9.05	12.09	9.59	11.40	11.78	8.39	8.84
05/26/11	11.48	10.08	11.58	11.97	9.55	11.25	9.27	11.26	11.32	7.62	8.26
06/22/11	11.62	10.75	11.83	12.00	9.55	11.43	9.09	11.12	11.29	7.73	8.27
07/27/11	11.58	10.51	11.88	11.92	9.85	11.34	8.91	11.11	11.12	7.71	8.45
08/26/11	11.78	10.56	12.16	12.30	9.56	11.59	9.31	11.39	11.05	7.39	8.12
09/27/11	11.54	10.07	11.83	11.99	9.51	11.30	8.85	11.06	11.00	7.28	7.66
10/28/11	11.35	9.57	11.50	11.72	9.82	11.12	9.78	10.91	11.19	8.48	8.52
11/30/11	11.46	10.49	11.87	12.06	9.60	10.92	9.51	11.20	10.53	7.84	8.19
12/29/11	11.57	9.74	11.94	11.98	9.99	11.50	9.39	11.00	11.62	8.48	8.92
01/26/12	11.61	10.44	11.73	12.43	10.21	11.71	9.51	11.19	11.81	7.99	8.45
02/28/12	11.74	10.55	11.79	12.23	9.90	11.66	9.73	11.44	11.89	8.16	8.94
03/29/12	11.23	10.41	11.38	11.29	10.09	11.22	9.64	10.51	11.17	8.49	9.13
04/26/12	12.20	10.52	12.31	12.87	9.51	12.47	9.72	11.74	12.29	8.08	8.95
05/30/12	12.52	10.88	12.42	12.84	10.17	12.65	10.14	11.95	12.48	8.42	9.68
06/27/12	11.33	11.02	11.03	11.32	10.20	11.23	10.27	10.80	11.32	8.88	9.65
07/31/12	11.73	10.93	12.12	12.07	9.73	11.84	9.78	11.60	11.39	8.12	8.74
08/27/12	12.23	10.51	12.44	12.48	9.63	12.06	9.57	11.98	11.61	7.46	8.07
09/24/12	11.41	10.96	11.40	11.41	9.91	11.37	9.83	11.07	11.21	9.15	9.14
10/26/12	11.13	10.92	11.26	11.85	9.97	11.32	10.04	10.17	11.21	8.32	8.23
11/26/12	11.46	10.82	11.48	11.94	9.92	10.87	9.92	11.50	11.59	8.51	8.63
12/26/12	11.45	10.26	11.60	12.05	9.92	11.43	8.92	11.33	10.34	8.65	8.03

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	OGC-7	MH11	MW-8	OGC-3	MH12	OGC-8	MH14	MW-9	OGC-4	MH15	MH16
Date											
01/30/13	10.95	9.36	10.67	11.42	9.44	10.37	8.38	11.04	11.28	7.60	7.56
02/27/13	10.80	9.53	11.20	11.45	9.58	11.25	8.80	10.95	11.26	8.80	8.27
03/27/13	10.93	9.59	11.14	11.20	9.47	11.12	8.77	10.99	11.19	7.95	8.14
04/24/13	11.01	10.00	11.21	10.89	9.57	10.16	8.94	10.65	10.74	8.06	8.22
05/24/13	11.01	9.19	11.25	11.47	9.37	11.36	8.33	11.01	11.20	8.10	8.08
06/27/13	10.27	10.61	10.48	10.86	8.78	8.69	8.82	11.25	11.25	9.05	9.07
07/24/13	10.96	8.54	11.17	11.30	8.70	10.60	8.10	10.62	10.54	8.71	8.94
08/22/13	11.26	8.63	11.37	11.66	9.01	11.16	8.41	11.23	11.16	7.51	7.56
09/30/13	10.97	8.81	11.10	11.39	8.87	11.00	8.25	10.95	10.98	7.54	7.42
10/30/13	10.71	8.62	10.83	11.08	8.66	10.47	8.25	10.57	10.46	7.18	6.85
11/27/13	10.91	8.97	11.05	11.31	8.88	10.21	8.02	10.65	10.80	6.83	6.34
12/31/13	11.07	9.11	11.27	11.58	7.60	11.15	8.55	11.08	11.32	7.11	6.39
01/30/14	11.06	9.14	11.37	11.53	9.24	11.37	9.15	11.14	11.47	7.56	7.83
02/26/14	10.94	9.22	11.37	11.48	9.39	11.09	9.41	10.93	11.27	8.04	7.84
03/28/14	10.90	9.41	11.16	11.40	9.15	11.11	8.48	11.09	11.18	8.07	8.43
04/25/14	10.89	8.75	10.97	11.43	9.38	11.18	8.18	11.02	10.80	7.54	7.47
05/29/14	11.55	8.88	11.97	12.18	8.54	11.90	8.72	11.73	11.10	8.46	8.65
06/25/14	11.25	7.62	11.52	11.90	9.94	11.68	9.38	11.45	11.14	8.50	8.97
07/29/14	10.83	8.51	11.10	11.43	8.65	11.05	8.71	10.94	10.51	7.09	7.75
08/26/14	10.82	8.16	11.12	11.39	8.63	10.87	8.25	10.99	10.58	6.52	6.41
09/30/14	11.07	8.53	11.35	11.53	8.90	11.04	8.41	11.02	11.16	7.54	7.60
10/29/14	10.85	8.32	11.01	11.25	8.94	10.80	8.18	10.68	10.65	7.66	7.40
11/25/14	11.05	8.92	11.27	11.55	9.22	11.03	8.63	10.87	11.36	7.73	7.46
12/30/14	11.49	9.67	11.83	12.01	9.47	11.51	8.47	11.34	11.71	8.25	8.11
01/28/15	10.85	8.87	11.08	11.36	8.92	11.09	8.27	10.93	11.12	6.55	7.25
02/24/15	10.86	NM	10.85	11.00	8.57	10.88	NM	11.56	11.72	7.63	7.22
03/25/15	9.92	9.53	6.27	5.96	6.15	8.66	NM	8.97	8.96	8.99	8.89
04/23/15	8.46	8.33	8.05	8.73	9.36	8.99	9.26	11.26	11.26	8.38	8.21
05/29/15	11.49	8.35	11.58	11.95	8.77	11.92	9.32	11.54	11.40	8.21	7.51

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	City MH1	City MH2	City MH3
Date			
01/29/10	8.64	8.94	8.74
02/26/10	10.42	10.15	9.35
03/30./10	10.14	9.11	9.29
04/30/10	11.25	11.09	10.99
05/26/10	9.97	9.26	8.96
06/28/10	8.15	7.86	7.69
07/27/10	9.71	8.92	8.61
08/26/10	10.06	8.96	9.50
09/29/10	10.22	9.54	9.48
10/27/10	11.42	10.80	10.43
11/24/10	10.98	9.03	9.12
12/28/10	9.12	8.27	8.26
01/31/11	11.66	10.34	10.45
02/28/11	9.62	8.82	8.57
03/30/11	10.22	10.05	10.03
04/27/11	10.54	9.86	9.60
05/26/11	10.42	10.01	9.79
06/22/11	10.90	9.42	9.69
07/27/11	10.72	10.51	10.13
08/26/11	10.38	9.81	9.27
09/27/11	10.35	8.48	8.46
10/28/11	10.50	9.52	9.40
11/30/11	10.63	9.69	8.71
12/29/11	10.78	10.27	10.02
01/26/12	10.07	10.02	9.73
02/28/12	11.21	10.15	9.48
03/29/12	10.80	9.90	9.86
04/26/12	11.16	10.52	10.52
05/30/12	11.28	10.85	10.52
06/27/12	10.99	10.92	10.83
07/31/12	9.83	8.60	7.98
08/27/12	10.19	10.21	9.81
09/24/12	11.10	9.86	10.01
10/26/12	9.41	9.13	9.10
11/26/12	10.02	9.75	9.47
12/26/12	8.89	9.17	8.08

Table 2.7

PH Readings
Gratwick-Riverside Park Site
North Tonawanda, New York

Monitoring Location	City MH1	City MH2	City MH3
Date			
01/30/13	6.20	6.49	8.05
02/27/13	9.84	9.69	9.34
03/27/13	10.15	8.91	8.64
04/24/13	9.06	9.10	9.04
05/24/13	10.21	8.97	9.02
06/27/13	9.55	9.05	9.34
07/24/13	6.49	6.99	7.03
08/22/13	8.09	7.96	7.92
09/30/13	8.74	7.75	7.57
10/30/13	8.88	7.48	7.30
11/27/13	NM	NM	NM
12/31/13	NM	NM	NM
01/30/14	10.87	8.86	7.57
02/26/14	8.59	7.91	7.70
03/28/14	9.61	8.79	9.06
04/25/14	8.70	8.57	8.76
05/29/14	10.66	9.69	9.53
06/25/14	10.42	10.05	9.84
07/29/14	9.78	9.01	8.80
08/26/14	10.04	9.26	8.83
09/30/14	10.09	9.44	8.96
10/29/14	10.05	9.63	9.29
11/25/14	10.46	8.21	8.41
12/30/14	10.62	8.82	9.02
01/28/15	7.50	6.75	6.28
02/24/15	6.17	6.61	6.22
03/25/15	7.61	7.49	7.73
04/23/15	8.63	8.46	8.30
05/29/15	10.46	9.80	8.98

Note:

NM - Not Measured due to Unsafe Road Conditions or Inaccessible due to Snow Cover.

Table 2.8

Effluent Sampling Summary
Subsequent to February 2007
Gratwick-Riverside Park Site
North Tonawanda, New York

LOCATIONS

Effluent monitoring station at Site discharge point

FREQUENCY

Semi-Annual (Spring and Fall as dictated by the City of North Tonawanda Industrial Wastewater Discharge Permit dated January 31, 2007)

PARAMETERS

Volatiles

Acetone
Benzene
2-Butanone
Chlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane
trans-1,2-Dichloroethene
Ethylbenzene
Methylene Chloride
Styrene
Tetrachloroethene
Toluene
1,1,1-Trichloroethane
Trichloroethene
Vinyl Chloride
Xylenes (Total)

Semi-Volatiles

1,4-Dichlorobenzene
1,2-Dichlorobenzene
2,4-Dimethylphenol
2-Methylphenol
4-Methylphenol
Naphthalene
Di-n-octylphthalate
Phenols (4AAP)

Wet Chemistry

Chloride
Cyanide
NH3
NO3
Phosphorous
Sulfate
Sulfide

Table 2.9

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park Site

Sample ID:												
Sample Date:		**03/07/11**	**09/15/11**	**03/08/12**	**09/13/12**	**03/14/13**	**09/12/13**	**04/16/14**	**10/07/14**	**04/16/15**	**Surface Water Standard**	
Parameter	**Unit**											(1)
Volatiles												
1,1,1-Trichloroethane	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5	
1,1-Dichloroethane	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5	
1,2-Dichloroethane	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	0.6	
2-Butanone	µg/L	25U	25U	25U	25U	25U	25U	25U	25U	25U	50	
Acetone	µg/L	25U	25U	25U	25U	25U	25U	25U	25U	25U	50	
Benzene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	1	
Chlorobenzene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.1	5.0U	5	
Ethylbenzene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5	
Methylene chloride	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5	
Styrene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5	
Tetrachloroethene	µg/L	5.0U	5.0U	5.0U	6.3	5.0U	5.0U	5.0U	5.0U	5.0U	0.7	(2)
Toluene	µg/L	12	11	15	27	16	13	14	13	5.0U	5	
trans-1,2-Dichloroethene	µg/L	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.0U	5.4	5.0U	5	
Trichloroethene	µg/L	30	20	43	50	45	34	38	26	5.0	5	
Vinyl chloride	µg/L	5.0U	5.0U	5.0U	5.3	5.0U	5.0U	5.0U	5.0U	5.0U	0.3	(2)
Xylene (total)	µg/L	10U	10U	17	18	18	10U	10U	10U	10U	5	
Semi-Volatiles												
1,2-Dichlorobenzene	µg/L	0.15U	0.15U	0.84	0.68	1.2	6.2	0.92	4.8U	4.8U	3	(7)
1,4-Dichlorobenzene	µg/L	0.090U	1.7	3.6	3.6	7.7	5.7	6.4	9.4	7.0	3	(7)
2,4-Dimethylphenol	µg/L	0.13U	2.5	7.4	5.5	7.3	6.5	10	7.8J	13	50	(2)
2-Methylphenol	µg/L	0.22U	0.22U	0.91	0.62	3.4	0.22U	0.44	5.3	6.2	NL	
4-Methylphenol	µg/L	0.62U	0.62U	3.1	3.0	6.7	1.3	0.62	7.4	59	NL	
Di-n-octyl phthalate	µg/L	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	4.6U	50	(2)
Naphthalene	µg/L	0.080U	0.080U	0.57	1.4	0.53	0.080U	0.47	0.82U	0.97	10	
Phenol	µg/L	0.12U	0.12U	0.12U	0.12U	5.5	0.12U	0.12U	22	4.0	1	

Table 2.9

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park Site

Sample ID:												
Sample Date:		**03/07/11**	**09/15/11**	**03/08/12**	**09/13/12**	**03/14/13**	**09/12/13**	**04/16/14**	**10/07/14**	**04/16/15**	**Surface Water Standard**	
Parameter	**Unit**											
Metals												
Aluminum	mg/L	0.45	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	NL	
Antimony	mg/L	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.020U	0.003	
Arsenic	mg/L	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.050	
Barium	mg/L	0.086	0.063	0.083	0.068	0.085	0.064	0.096	0.067	0.092	1.0	
Beryllium	mg/L	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	0.0020U	1.1	(6)
Cadmium	mg/L	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.0010U	0.005	
Chromium	mg/L	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.0040U	0.050	
Copper	mg/L	0.023	0.010U	0.010U	0.013	0.050	0.013	0.010U	0.014	0.010U	0.023	(3)
Iron	mg/L	0.39	0.050U	0.050U	0.050U	0.050U	0.050U	0.40	0.050U	0.17	0.30	
Lead	mg/L	0.0050U	0.0050U	0.0050U	0.0067	0.0050U	0.0050U	0.0050U	0.0050U	0.0050U	0.012	
Magnesium	mg/L	3.5	1.6	2.2	0.99	2.9	0.78	5.5	1.1	6.5	35	
Manganese	mg/L	0.012	0.030U	0.0030U	0.0030U	0.0030U	0.0030U	0.010	0.0030U	0.018	0.30	
Mercury	mg/L	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	0.00020U	2.6E-06	(4)
Nickel	mg/L	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.10	
Selenium	mg/L	0.015U	0.015U	0.015U	0.015U	0.015U	0.015U	0.015U	0.015U	0.015U	0.0046	(4)
Silver	mg/L	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.0030U	0.050	
Sodium	mg/L	372	267	380	238	353	206	359	233	361	NL	
Zinc	mg/L	0.010	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	0.010U	2.0	(2)

Table 2.9

Analytical Results Summary
Site Effluent
Gratwick-Riverside Park Site

Sample ID:											
Sample Date:		**03/07/11**	**09/15/11**	**03/08/12**	**09/13/12**	**03/14/13**	**09/12/13**	**04/16/14**	**10/07/14**	**04/16/15**	**Surface Water Standard** (1)
Parameter	**Unit**										
General Chemistry											
pH	S.U.	9.95	9.75	10.51	10.82	10.32	10.38	10.22	9.90	9.20	NL
Hardness	mg/L	235	244	268	176	250	192	252	180	340	NL
Total Dissolved Solids (TDS)	mg/L	1450	1030	1280	911	1170	823	1360	872	1430	NL
Total Suspended Solids (TS	mg/L	6	3	4	4	7	12	8	2	16	NL
Chloride	mg/L	655	425	551	326	398	333	633	386	662	250
BOD	mg/L	16	22	21	45	16	18	10.3	20	13.3	NL
COD	mg/L	37	28	33	70	37	21	17	75	5.0U	NL
Oil and Grease	mg/L	0.10U	0.10U	0.20	0.10U	0.2	0.10U	0.10U	0.10U	0.10U	NL
Organic Carbon	mg/L	8.1	7.2	6.9	8.2	8.0	7.6	6.6	13.4	5.0U	NL
Alkalinity, Total (As CaCO3)	mg/L	57	30.5	32.0	44.6	48.9	47.2	29	47.3	40.0	NL
Bicarbonate (as CaCO3)	mg/L	11.1	5.0	8.0	5.0U	5.0U	5.0U	21	5.0U	40.0	NL
Ammonia	mg/L	1.12	1.12	1.68	2.52	2.52	0.84	1.1	1.12	0.84	2.0
Nitrate (as N)	mg/L	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	10
TKN	mg/L	2.24	1.68	2.24	4.48	3.08	1.12	1.68	1.68	1.12	NL
Sulfate	mg/L	135	150	191	159	118	166	183	136	216	250
Sulfide	mg/L	2.0	4.8	4.0	3.0	4.4	3.6	3.2	3.6	2.0	0.002
Phenol	mg/L	0.008U	0.009U	0.009	0.008U	0.012U	0.011U	0.009U	0.011U	0.085U	0.001
Phosphorous	mg/L	0.13	0.17	0.09	0.15	0.12	0.16	0.16	0.17	0.10	0.020 (2)
Cyanide	mg/L	0.005	0.005U	0.005	0.005U	0.005U	0.005U	0.005U	0.005U	0.005U	0.0052

Notes:

U - Non-detect at associated value
- - Not Analyzed
J - Estimated
NL - Not Listed
SL - Sample Lost
(1) - Lowest Standard/Guidance Value shown
(2) - Guidance Value
(3) - Calculated using a hardness of 300 ppm
(4) - Applies to dissolved form
(5) - TOC analyzer malfunction prevented analysis of this compound
(6) - Hardness >75 mg/L
(7) - Sum of isomers <5 µg/L

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons)	
	Monthly	Total
May 2001	2,900,000	2,900,000
June 2001	2,353,800	5,253,800
July 2001	1,488,500	6,742,300
August 2001	712,800	7,455,100
September 2001	473,100	7,928,200
October 2001	1,213,100	9,141,300
November 2001	1,281,100	10,422,400
December 2001	231,700 (1)	10,654,100
January 2002	1,383,200 (2)	12,037,300
February 2002	1,186,000	13,223,300
March 2002	233,600	13,456,900
April 2002	736,000	14,192,900
May 2002	348,200	14,541,100
June 2002	1,137,200	15,678,300
July 2002	869,300	16,547,600
August 2002	1,060,800	17,608,400
September 2002	707,000	18,315,400
October 2002	679,800	18,995,100
November 2002	489,500	19,484,700
December 2002	743,500	20,228,200
January 2003	1,150,700	21,378,900
February 2003	483,300	21,862,200
March 2003	402,300	22,264,500
April 2003	531,900	22,796,400
May 2003	655,600	23,452,000
June 2003	682,100	24,134,000
July 2003	942,000	25,076,100
August 2003	627,500	25,703,600
September 2003	349,600	26,053,200
October 2003	966,500	27,019,700
November 2003	442,200	27,461,900
December 2003	463,900	27,925,800
January 2004	443,900	28,369,700
February 2004	253,700	28,623,400
March 2004	403,700	29,027,100
April 2004	433,600	29,460,700
May 2004	377,400	29,838,100
June 2004	395,000	30,233,100
July 2004	384,300	30,617,400
August 2004	479,700	31,097,100
September 2004	413,900	31,511,000
October 2004	319,400	31,902,400
November 2004	249,200	32,151,600
December 2004	209,900	32,361,500

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
January 2005	310,100	32,671,600
February 2005	301,100	32,972,700
March 2005	250,200	33,222,900
April 2005	378,400	33,601,300
May 2005	458,800	34,060,100
June 2005	455,900	34,516,000
July 2005	270,200	34,786,200
August 2005	285,100	35,071,300
September 2005	395,600	35,466,900
October 2005	333,200	35,800,100
November 2005	360,200	36,160,300
December 2005	395,300	36,555,600
January 2006	297,500	36,853,100
February 2006	508,300	37,361,400
March 2006	244,700	37,606,100
April 2006	224,400	37,830,500
May 2006	153,300	37,983,800
June 2006	262,300	38,246,100
July 2006	212,900	38,459,000
August 2006	357,500	38,816,500
September 2006	777,000	39,593,500
October 2006	254,700	39,848,200
November 2006	778,700	40,626,900
December 2006	496,600	41,123,500
January 2007	410,500	41,534,000
February 2007	494,600	42,028,600
March, April & May 2007	1,489,200[3]	43,517,800
June 2007	334,300	43,852,100
July 2007	258,600	44,110,700
August 2007	239,000	44,349,700
September 2007	59,500[4]	44,409,200
October 2007 through January 2008	50,600[4]	44,459,800
February 2008	23,800[4]	44,483,600
March 2008	1,238,300	45,721,900
April 2008	2,126,700	47,848,600
May 2008	1,771,100	49,619,700
June 2008	618,000	50,237,700
July 2008	1,559,200	51,796,900
August 2008	1,365,900	53,162,800
September 2008	1,998,000	55,160,800
October 2008	2,511,100	57,671,900
November 2008	1,151,600	58,823,500
December 2008	572,700	59,396,200

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons)	
	Monthly	Total
January 2009	1,021,700	60,417,900
February 2009	2,661,400	63,079,300
March 2009	4,239,300	67,318,600
April 2009	1,189,900	68,508,500
May 2009	1,362,500	69,871,000
June 2009	1,035,200	70,906,200
July 2009	1,010,100	71,916,300
August 2009	1,058,000	72,974,400
September 2009	947,000	73,921,400
October 2009	690,800	74,612,200
November 2009	697,500	75,309,700
December 2009	1,100,900	76,410,600
January 2010	767,100	77,177,700
February 2010	398,600	77,576,300
March 2010	1,094,500	78,670,800
April 2010	761,000	79,431,800
May 2010	354,700	79,786,500
June 2010	170,300	79,956,800
July 2010	323,600	80,280,400
August 2010	1,292,400	81,572,800
September 2010	672,800	82,245,600
October 2010	972,800	83,218,400
November 2010	433,500	83,651,900
December 2010	483,900	84,135,800
January 2011	420,300	84,556,100
February 2011	257,000	84,813,100
March 2011	1,136,700	85,949,800
April 2011	875,300	86,825,100
May 2011	727,500	87,552,600
June 2011	489,500	88,042,100
July 2011	459,300	88,501,400
August 2011	296,900	88,798,300
September 2011	390,300	89,188,600
October 2011	414,800	89,603,400
November 2011	393,100	89,996,500
December 2011	583,300	90,579,800
January 2012	651,800	91,231,600
February 2012	276,900	91,508,500
March 2012	586,600	92,095,100
April 2012	400,600	92,495,700
May 2012	458,800	92,954,500
June 2012	369,300	93,323,800
July 2012	15,600[5]	93,339,400
August 2012	399,400	93,738,800
September 2012	513,500	94,252,300

Table 2.10

Groundwater Volumes Discharged
to North Tonawanda POTW
Gratwick-Riverside Park Site
North Tonawanda, New York

Month	Volumes (gallons) Monthly	Total
October 2012	344,500	94,596,800
November 2012	336,600	94,933,400
December 2012	286,800	95,220,200
January 2013	329,800	95,550,000
February 2013	217,400	95,767,400
March 2013	260,200	96,027,600
April 2013	249,900	96,277,500
May 2013	200,500	96,478,000
June 2013	211,300	96,689,300
July 2013	245,600	96,934,900
August 2013	165,100	97,100,000
September 2013	216,500	97,316,500
October 2013	118,600	97,435,100
November 2013	203,800	97,638,900
December 2013	117,400	97,756,300
January 2014	111,700	97,868,000
February 2014 (6)	66,700	97,934,700
March 2014 (6)	5,800	97,940,500
April 2014 (6)	5,000	97,945,500
May 2014 (6)	8,600	97,954,100
June 2014 (6)	8,500	97,962,600
July 2014 (6)	15,400	97,978,000
August 2014	1,385,800	99,363,800
September 2014	869,700	100,233,500
October 2014	1,426,200	101,659,700
November 2014	638,400	102,298,100
December 2014	753,200	103,051,300
January 2015 (7)	126,600	103,177,900
February 2015 (7)	43,200	103,221,100
March 2015	2,115,700	105,336,800
April 2015	2,113,500	107,450,300
May 2015	1,939,200	109,389,500

Notes:

(1) To December 7, 2001.

(2) From December 8, 2001.

(3) Plotted as 496,400 gallons on Figure 2.18 for each of March, April, and May 2007.

(4) Flow Meter malfunctioned due to tar-like material buildup inside meter. Meter was cleaned on March 14, 2008. Volumes not plotted on Figure 2.18 as volumes are not representative of actual volume removed.

(5) Flow low due to pump failure. Two pumps replaced.

(6) Flow meter malfunctioning. Cleaned and repaired on August 8, 2014. Volumes not plotted on Figure 2.18

(7) PS#1, PS#2 and PS#3 not operational as of January 28, 2015.
PS#1 operational on March 2, 2015.
PS#2 operational on March 17, 2015.

Table 2.11

Summary of OJM Activities
June 2014 to May 2015

Date	Description
June 10, 2014	For cemain in the vicinity of P.S.#3 was jetted
July 22, 2014	High amp draw on P.S.#2 cleaned with acid bath
August 8, 2014	Flow meter was cleaned and repaired
September 30, 2014	P.S.#3 was observed not to be operational
October 29, 2014	Subsidence in ground was observed adjacent to MH4
December 26, 2014	P.S.#1 was observed not to be operational
January 15, 2015	New pumps ordered for P.S.#1
January 28, 2015	All three P.S. observed not to be operational
February 5, 2015	New pumps ordered for P.S.#2 and P.S.#3
February 20, 2015	New pump installed in P.S.#1. Difficulties encountered in seating pump properly.
March 2, 2015	New pump in P.S.#1 operational.
March 11, 2015	New pumps for P.S.#2 and P.S.#3 received.
March 12, 2015	Letter received from NYSDEC.
March 17, 2015	New pump installed and operational in P.S.#2.
March 19, 2015	New pump installed in P.S.#3. Difficulties encountered in seating pump properly.
April 9, 2015	Response submitted for March 12, 2015 letter from NYSDEC.
April 28, 2015	High amp draw on P.S.#2. Cleaned with acid bath.
April and May 2015	Continuing effors being made to have the P.S.#3 pump seat properly with the discharge forcemain.
May 11, 2015	High amp draw on P.S.#2. Cleaned with acid bath.

Appendices

Appendix A
City Of North Tonawanda Industrial Wastewater Discharge Permit

CITY OF NORTH TONAWANDA
INDUSTRIAL WASTEWATER DISCHARGE PERMIT

Permit Number: 2628011

In accordance with the provisions of the Clean Water Act as amended, all terms and conditions set forth in this permit, the City of North Tonawanda Local Sewer Use Ordinance and any applicable Federal, State or local laws or regulations, authorization is hereby granted to: City of North Tonawanda
830 River Road
North Tonawanda, New York 14120

Site: **Gratwick Riverside Park**
River Road
North Tonawanda, New York 14120

Classified by S.I.C. Number(s): N/A

for the discharge of remedial action ground water into the City of North Tonawanda Sewerage System.

This permit is granted in accordance with an application filed on 05/01/96 in the offices of the Wastewater Treatment Plant Superintendent located at 830 River Road, and in conformity with specifications and other required data submitted in support of the above named application, all of which are filed with and considered part of this permit. This permit is also granted in accordance with discharge limitations and requirements, monitoring and reporting requirements, and all other conditions set forth in Parts I and II hereof.

Effective this 1st day of March, 2013

To expire the 28th day of February, 2016

_____

David A. Scott, Water Works Superintendent

Signed this ____ day of March, 2013

PART I. SPECIFIC CONDITIONS

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of this permit and lasting until the expiration date, discharge from the permitted facility outfall(s) shall be limited and monitored by the permittee as specified below (Refer to attached map for sampling and monitoring sites).

Sample Point	Parameter	Discharge Limitations mg/l except pH Daily Max.	Sampling Period	Sampling Type
001	Total Flow		1 Sampling Day Monthly	continuous
	pH	Monitor Only	1 Sampling Day Monthly	grab
	Vinyl Chloride	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Acetone	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Methylene Chloride	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,1,1-Trichloroethane	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,1-Dichloroethane	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,2-Dichloroethane (total)	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	2-Butanone	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Trichlorethene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Benzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.

Sample Point	Parameter	Discharge Limitations mg/l except pH Daily Max. Monthly Avg.	Sampling Period	Sampling Type
001	Tetrachloroethene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Toluene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Chlorobenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Ethylbenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Styrene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Xylenes (total)	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Phenol (4AAP)	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	trans-1,2-Dichloroethene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,4-Dichlorobenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	1,2-Dichlorobenzene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	2-Methylephenol	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	4-Methylephenol	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	2,4-Dimethylphenol	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Di-n-octylphthalate	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Napthalene	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Cyanide	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	NH3	Monitor Only	1 Sampling Day semi-annual	grab
	Chloride	Monitor Only	1 Sampling Day semi-annual	24 hr comp.

Sample Point	Parameter	Discharge Limitations mg/l except pH Daily Max. Monthly Avg.	Sampling Period	Sampling Type
001	NO3	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Phosphorous	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Sulfate	Monitor Only	1 Sampling Day semi-annual	24 hr comp.
	Sulfide	Monitor Only	1 Sampling Day semi-annual	24 hr comp.

*/- See Special requirements page for sub-note requirements.

PART I. SPECIFIC CONDITIONS
DISCHARGE MONITORING AND REPORTING REQUIREMENTS

During the period beginning the effective date of this permit and lasting until the expiration date, discharge monitoring results shall be summarized and reported by the permittee no later than the days specified below.

Sample Point	Parameter	Initial Monitoring Report	Subsequent Monitoring Reports
001	Vinyl Chloride	January 31, 2007	Semi-annual for all
	Acetone	January 31, 2007	
	Carbon Disulfide	January 31, 2007	
	1,1-Dichloroethene	January 31, 2007	
	1,1-Dichloroethane	January 31, 2007	
	1,2-Dichloroethane (total)	January 31, 2007	
	2-Butanone	January 31, 2007	
	Trichlorethene	January 31, 2007	
	Benzene	January 31, 2007	
	Tetrachloroethene	January 31, 2007	
	Toluene	January 31, 2007	
	Chlorobenzene	January 31, 2007	
	Ethylbenzene	January 31, 2007	
	Styrene	January 31, 2007	
	Xylenes (total)	January 31, 2007	

Sample Point	Parameter	Initial Monitoring Report	Subsequent Monitoring Reports
001	Phenol	January 31, 2007	Semi-annual for all
	1,3-Dichlorobenzene	January 31, 2007	
	1,4-Dichlorobenzene	January 31, 2007	
	1,2-Dichlorobenzene	January 31, 2007	
	2-Methylephenol	January 31, 2007	
	4-Methylephenol	January 31, 2007	
	2,4-Dimethylphenol	January 31, 2007	
	1,2,4-Trichlorobenzene	January 31, 2007	
	Napthalene	January 31, 2007	
	2-Methylnaphthalene	January 31, 2007	
	n-Nitrosodidiphenylamine	January 31, 2007	
	Di-n-butylphthalate	January 31, 2007	

PART I. SPECIFIC CONDITIONS

C. SPECIAL REQUIREMENTS

1) This permit is written for a duration of three (3) years. Upon renewal of this permit, all parameters will be re-evaluated to develop a parameter list based on chemical concentrations present in the extracted groundwater.

2) Fequency of monitoring is to be re-evaluated after each year. Sampling to be done semi-annual (Spring – Fall).

3) All monitoring reports (initial and subsequent), are to be received by the Superintendent, no later than thirty (30) days after receipt of validated data.

4) It is required that the Permittee have a Site Operations Manual available at all times. All emergency phone numbers must be listed in an appropriate place for easy access by operations personnel. All pumping operations shall be accomplished under no-bypass conditions. The Permittee is required to cease all pumping operations upon verbal request of the North Tonawanda Water/Wastewater Superintendent or his designee. Pumping operations shall not recommence until approval by the North Tonawanda Water/Wastewater Superintendent or his designee.

5) Analysts are required to use GC/MS method detection limits for most organics (if GC/MS is appropriate); GC/ECD for PCB's/Pesticides and GF method detection limits for metals (where GF is appropriate), as contained in attachment 5 of the NYSDEC TOGs 1.3.8 – New Discharges to Publicly Owned Treatment Works – dated 10/26/94.

Appendix B
Monthly Inspection Logs
(June 2014 to May 2015)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 0|6|2|5|1|4| (MM DD YY)

INSPECTOR(S): D. Tyran

	Item	*Inspect For*	*Action Required*	*Comments*
	1. Perimeter Collection System/Off-Site Forcemain			
X	Manholes	- cover on securely	None	6" lid for MH8 observation
X		- condition of cover		Port missing
X		- condition of inside of manhole		
		- flow conditions		
X	Wet Wells	- cover on securely		
X		- condition of cover		
X		- condition of inside of wet well		
	2. Landfill Cap			
X	Vegetated Soil Cover	- erosion		wire mesh exposed in areas
X		- bare areas		along top of bank
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 06/25/19 (MM DD YY)

INSPECTOR(S): D. Tyler

Item	Inspect For	Action Required	Comments
2. **Landfill Cap (continued)**			
☒ Access Roads	- bare areas, dead/dying veg.	None	
☒	- erosion		
☒	- potholes or puddles		
☒	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
	- change in water budget		
	- general condition of wetlands		
4. **Other Site Systems**			
☐ Perimeter Fence	- integrity of fence	NA	
☐	- integrity of gates		
☐	- integrity of locks		
☐	- placement and condition of signs		

FORM 17

CRA 7937 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 10/27/11 (MM DD YY)

INSPECTOR(S): D. Tynan

	Item	Inspect For	Action Required	Comments
	4. Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	None	Oily sheen along shore just North of River South outfall
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X		- dead/dying vegetation		
X		- cable concrete/ gabion mats and riprap		Lots of gabion mats exposed along Shoreline
X	Culverts	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions	12" piece of driftwood blocking River Middle outfall	
X	Gas Vents	- intact / damage		
X	Wells	- locks secure		Gabion mats exposed along shoreline
X	Shoreline Stabilization	- condition of gabion mats and riprap		

FORM 17

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 07/29/14 (MM DD YY)

INSPECTOR(S): S. Gardner, S. Zimmerman

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	None	6" lid for MH 8 Missing from observation port
X		- condition of cover		
X		- condition of inside of manhole	MH-16, MH-14, MH-3, MH-6, MH-2	lids bolted down no sediment depths taken
		- flow conditions		
X	Wet Wells	- cover on securely		
X		- condition of cover		
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion		Wire mesh exposed in areas along bank between MH-15 and OGC-4
X		- bare areas		
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/29/14 (MM DD YY)

INSPECTOR(S): S. Gardner S. Zimmerman

	Item	*Inspect For*	*Action Required*	*Comments*
2.	**Landfill Cap (continued)**			
☐	Access Roads	- bare areas, dead/dying veg.	None	
☐		- erosion	↓	
☐		- potholes or puddles	↓	
☐		- obstruction	↓	
3.	**Wetlands (Area "F")**	- dead/dying vegetation	↓	
		- change in water budget	↓	
		- general condition of wetlands	↓	
4.	**Other Site Systems**			
☐	Perimeter Fence	- integrity of fence	N/A	
☐		- integrity of gates	↓	
☐		- integrity of locks	↓	
☐		- placement and condition of signs		

FORM 17

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/29/14 (MM DD YY)

INSPECTOR(S): S. Gardner S. Zimmerman

	Item	*Inspect For*	*Action Required*	*Comments*
4.	**Other Site Systems (continued)**			
☐	Drainage Ditches/ Swale Outlets	- sediment build-up	None	
☐		- erosion		
☐		- condition of erosion protection		
☐		- flow obstructions		
☐		- dead/dying vegetation		
☐		- cable concrete/gabion mats and riprap		
☐	Culverts	- sediment build-up	None	
☐		- erosion		
☐		- condition of erosion protection		
☐		- flow obstructions	Cleared out	River North outfall full of debris and small pieces of driftwood
☐	Gas Vents	- intact / damage		
☐	Wells	- locks secure		
☐	Shoreline Stabilization	- condition of gabion mats and riprap		

FORM 17

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 08/26/14 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
1. **Perimeter Collection System/Off-Site Forcemain**			
Manholes	- cover on securely	WELL L10 MISSING FROM OBSERVATION WELL (MH 8)	
	- condition of cover		
	- condition of inside of manhole	MH10, MH14, MH8, MH6, MH2 LIDS BOLTED DOWN	
	- flow conditions	NO SEDIMENT DEPTHS TAKEN	
Wet Wells	- cover on securely	NONE	
	- condition of cover		
	- condition of inside of wet well		
2. **Landfill Cap**			
Vegetated Soil Cover	- erosion	WIRE MESH EXPOSED IN AREAS ALONG BANK BETWEEN	
	- bare areas	MH 15 AND OGC-4	
	- washouts	NONE	
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

CRA 7987 (24)

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 08/26/14 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
2. **Landfill Cap (continued)**			
Access Roads	- bare areas, dead/dying veg.	NONE	
	- erosion		
	- potholes or puddles		
	- obstruction		
3. **Wetlands (Area "F")**	- dead/dying vegetation		
	- change in water budget		
	- general condition of wetlands		
4. **Other Site Systems**			
Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

CRA 7987 (24)

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 08/26/14 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
4. **Other Site Systems (continued)**			
Drainage Ditches/ Swale Outlets	- sediment build-up	NONE	
	- erosion		
	- condition of erosion protection		
	- flow obstructions		
	- dead/dying vegetation		
	- cable concrete/gabion mats and riprap		LOTS OF GABION MATS EXPOSED ALONG SHORE LINE
Culverts	- sediment build-up		
	- erosion		
	- condition of erosion protection		
	- flow obstructions		
Gas Vents	- intact / damage	NA	
Wells	- locks secure	NONE	
Shoreline Stabilization	- condition of gabion mats and riprap		GABION MATS EXPOSED ALL ALONG SHORELINE

FORM 17

Sharon Gardner

CRA 7987 (24)

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 09/30/14 (MM DD YY)

INSPECTOR(S): D. Tyran S. Gardner

Item	*Inspect For*	*Action Required*	*Comments*
1. Perimeter Collection System/Off-Site Forcemain			
✓ Manholes	- cover on securely	None	
✓	- condition of cover		
✓	- condition of inside of manhole		
✓	- flow conditions		
✓ Wet Wells	- cover on securely		
✓	- condition of cover		
✓	- condition of inside of wet well		
2. Landfill Cap			
✓ Vegetated Soil Cover	- erosion		
✓	- bare areas		
✓	- washouts		
✓	- leachate seeps		
✓	- length of vegetation		
✓	- dead/dying vegetation		

FORM 17

CRA 7987 (24)

David J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 09/30/14 (MM DD YY)

INSPECTOR(S): D. Tyran S. Gardner

Item	*Inspect For*	*Action Required*	*Comments*
2. Landfill Cap (continued)			
✓ Access Roads	- bare areas, dead/dying veg.	None	
✓	- erosion	None	
✓	- potholes or puddles	Small potholes along edges of main roadway	
✓	- obstruction	None	
3. Wetlands (Area "F")	- dead/dying vegetation		
	- change in water budget		
	- general condition of wetlands		
4. Other Site Systems			
Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

CRA 7987 (24)

David J. Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 09 | 30 | 14 (MM DD YY)

INSPECTOR(S): D. Tyran S. Gardner

Item	Inspect For	Action Required	Comments
4. Other Site Systems (continued)			
✓ Drainage Ditches/ Swale Outlets	- sediment build-up	None	
✓	- erosion		
✓	- condition of erosion protection		
✓	- flow obstructions		
✓	- dead/dying vegetation		
✓	- cable concrete/gabion mats and riprap		
✓ Culverts	- sediment build-up		
✓	- erosion		
✓	- condition of erosion protection		
✓	- flow obstructions	Stones & driftwood blocking River N. outfall	Cleared blockage.
X Gas Vents	- intact / damage	None	
✓ Wells	- locks secure	None	
✓ Shoreline Stabilization	- condition of gabion mats and riprap	gabion mats exposed in various locations	

FORM 17

CRA 7987 (24)

D. Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 1 1 0 2 9 1 4 (MM DD YY)

INSPECTOR(S): D Tyran S Gardner

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	MH 15 level is high Level floats are	
X		- condition of cover	out of the water sitting on the grating	
X		- condition of inside of manhole	MH 4 which was noted to have small caved in	
X		- flow conditions	area has since increased to hole approx 4x 2x	
X	Wet Wells	- cover on securely	1½ feet Deep	
X		- condition of cover		
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	None	
X		- bare areas		
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 10/29/14 (MM DD YY)

INSPECTOR(S): D. Tyran S. Gardner

	Item	Inspect For	Action Required	Comments
2.	**Landfill Cap (continued)**			
X	Access Roads	- bare areas, dead/dying veg.	None	
X		- erosion	↓	
X		- potholes or puddles	Small Pot holes along edges of Main Roadway	
X		- obstruction	None	
3.	**Wetlands (Area "F")**	- dead/dying vegetation	↓	
		- change in water budget		
		- general condition of wetlands		
4.	**Other Site Systems**			
	Perimeter Fence	- integrity of fence	N/A	
		- integrity of gates	↓	
		- integrity of locks		
		- placement and condition of signs		

FORM 17

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 10/29/14 (MM DD YY)

INSPECTOR(S): D. Tyran S. Gardner

	Item	Inspect For	Action Required	Comments
4.	**Other Site Systems (continued)**			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	Gabion mats exposed in various locations	

FORM 17

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 11/25/14 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
1. **Perimeter Collection System/Off-Site Forcemain**			
Manholes	- cover on securely	MH IS LEVEL STILL HIGH LEVEL FLOATS ARE OUT	
	- condition of cover	OF THE WATER SITING ON GRATING	
	- condition of inside of manhole		
	- flow conditions		
Wet Wells	- cover on securely		
	- condition of cover		
	- condition of inside of wet well		
2. **Landfill Cap**			
Vegetated Soil Cover	- erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

CRA 7987 (24)

Sharon Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 11 | 25 | 14 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
2. **Landfill Cap (continued)**			
Access Roads	- bare areas, dead/dying veg.	NONE	
	- erosion		
	- potholes or puddles		
	- obstruction		
3. **Wetlands (Area "F")**	- dead/dying vegetation		
	- change in water budget		
	- general condition of wetlands		
4. **Other Site Systems**			
Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

CRA 7987 (24)

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 11/25/14 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

	Item	*Inspect For*	*Action Required*	*Comments*
4.	**Other Site Systems (continued)**			
☒	Drainage Ditches/ Swale Outlets	- sediment build-up	RIVER MIDDLE OUTLET NOT MEASURED DUE TO HIGH WINDS + WAVES CRASHING INTO THE SHORELINE MAKING IT VERY SLIPPERY & DANGEROUS	
		- erosion		
		- condition of erosion protection		
		- flow obstructions	NONE	
		- dead/dying vegetation		
		- cable concrete/ gabion mats and riprap		
☒	Culverts	- sediment build-up		
		- erosion		
		- condition of erosion protection		
		- flow obstructions		
☐	Gas Vents	- intact / damage		
	Wells	- locks secure		
☒	Shoreline Stabilization	- condition of gabion mats and riprap	GABION MATS EXPOSED IN VARIOUS AREAS ALONG SHORELINE	

FORM 17

CRA 7987 (24)

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 1 2 3 0 1 4 (MM DD YY)

INSPECTOR(S): D. Tyran / S. Gardner

	Item	Inspect For	Action Required	Comments
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	None	
X		- condition of cover	↓	
X		- condition of inside of manhole		
X		- flow conditions		
X	Wet Wells	- cover on securely	Level in Pump chamber 3 still high. Control floats are sitting on the grate. MH 3 (Pump Chamber #1) is very high less than 3' from ground surface	
X		- condition of cover		
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	None	
X		- bare areas	↓	
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

CRA 7987 (24)

Dave J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 12/30/14 (MM DD YY)

INSPECTOR(S): D. Tyran / S. Gardner

	Item	*Inspect For*	*Action Required*	*Comments*
2.	**Landfill Cap (continued)**			
X	Access Roads	- bare areas, dead/dying veg.	None	
X		- erosion		
X		- potholes or puddles		
X		- obstruction		
3.	Wetlands (Area "F")	- dead/dying vegetation		
		- change in water budget		
		- general condition of wetlands		
4.	**Other Site Systems**			
	Perimeter Fence	- integrity of fence	NA	
		- integrity of gates		
		- integrity of locks		
		- placement and condition of signs		

FORM 17

CRA 7987 (24)

David Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 1/23/0/14 (MM DD YY)

INSPECTOR(S): D. Tyran / S. Gardner

	Item	*Inspect For*	*Action Required*	*Comments*
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions	Large log 12"Ø 40' Long in front of River North	
X	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	Gabion Mats exposed in various areas along entire Shoreline	

FORM 17

CRA 7987 (24)

D. Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/28/15 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
1. **Perimeter Collection System/Off-Site Forcemain**			
Manholes	- cover on securely	NONE	
	- condition of cover		
	- condition of inside of manhole		
	- flow conditions		
Wet Wells	- cover on securely	LEVELS IN ALL THREE PUMPING CHAMBERS WERE HIGH, NONE OF THE PUMPS WERE RUNNING MH15 PUMP CHAMBER 3, MH-9 PUMP CHAMBER 2, MH-3 PUMP CHAMBER 1	
	- condition of cover		
	- condition of inside of wet well		
2. **Landfill Cap**			
Vegetated Soil Cover	- erosion	NONE	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

Shayne Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/28/15 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
2. **Landfill Cap (continued)**			
[X] Access Roads	- bare areas, dead/dying veg.	NONE	
[X]	- erosion		
[X]	- potholes or puddles		
[X]	- obstruction		
3. **Wetlands (Area "F")**	- dead/dying vegetation		
[X]	- change in water budget		
	- general condition of wetlands		
4. **Other Site Systems**			
[ ] Perimeter Fence	- integrity of fence	NA	
[ ]	- integrity of gates		
[ ]	- integrity of locks		
[ ]	- placement and condition of signs		

FORM 17

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 01/28/15 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
4. Other Site Systems (continued)			
Drainage Ditches/ Swale Outlets	- sediment build-up	NONE	
	- erosion		
	- condition of erosion protection		
	- flow obstructions		
	- dead/dying vegetation		
	- cable concrete/gabion mats and riprap		
Culverts	- sediment build-up		
	- erosion		
	- condition of erosion protection		
	- flow obstructions	LARGE LOG 12" Φ 40' LONG IN FRONT OF RIVER	
Gas Vents	- intact / damage	NORTH OUTFALL	
Wells	- locks secure		
Shoreline Stabilization	- condition of gabion mats and riprap		

FORM 17

Shaun Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 02/24/15 (MM DD YY)

INSPECTOR(S): O TYRAN, S GARDNER

Item	*Inspect For*	*Action Required*	*Comments*
1. **Perimeter Collection System/Off-Site Forcemain**			
Manholes	- cover on securely	MANHOLES 11, 8, 14 ALL UNDER 3' TO 6' OF	
	- condition of cover	SNOW & ICE NOT MEASURED	
	- condition of inside of manhole		
	- flow conditions		
Wet Wells	- cover on securely	W/LS IN ALL PUMPING CHAMBERS MH-15, MH-9,	
	- condition of cover	MH-3 ALL HIGH PUMPS STILL NOT RUNNING	
	- condition of inside of wet well		
2. **Landfill Cap**			
Vegetated Soil Cover	- erosion	ENTIRE SITE COVERED UNDER 3' TO 6' OF SNOW	
	- bare areas		
	- washouts		
	- leachate seeps		
	- length of vegetation		
	- dead/dying vegetation		

FORM 17

CRA 7987 (24)

Shayne Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 02/24/15 (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
2. **Landfill Cap (continued)**			
X Access Roads	- bare areas, dead/dying veg.	NONE	
	- erosion		
	- potholes or puddles		
	- obstruction		
3. **Wetlands (Area "F")**	- dead/dying vegetation		
X	- change in water budget		
	- general condition of wetlands		
4. **Other Site Systems**			
Perimeter Fence	- integrity of fence	NA	
	- integrity of gates		
	- integrity of locks		
	- placement and condition of signs		

FORM 17

CRA 7987 (24)

Shawn Gardner

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 02/24/ST (MM DD YY)

INSPECTOR(S): D TYRAN, S GARDNER

Item	Inspect For	Action Required	Comments
4. **Other Site Systems (continued)**			
Drainage Ditches/ Swale Outlets	- sediment build-up	RIVER MIDDLE + NORTH OUTFALL NOT MEASURED DUE TO 2' OF SNOW & ICE PILED UP INFRONT OF THE PIPE	
	- erosion		
	- condition of erosion protection		
	- flow obstructions	NONE	
	- dead/dying vegetation		
	- cable concrete/ gabion mats and riprap		
Culverts	- sediment build-up		
	- erosion		
	- condition of erosion protection		
	- flow obstructions		
Gas Vents	- intact / damage	NA	
Wells	- locks secure	NONE	
Shoreline Stabilization	- condition of gabion mats and riprap		

FORM 17

CRA 7987 (24)

Shawn Maidment

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: ~~Wheatfield,~~ N. Tonawanda New York

DATE: 03/25/15 (MM DD YY)

INSPECTOR(S): A. Iwanicki D. Tyran

	Item	Inspect For	Action Required	Comments
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	Manhole 14 not located still under 3ft of Snow	
X		- condition of cover	Large boulder pushed onto MH8. Pulled boulder off MH	
X		- condition of inside of manhole	with truck & towing strap.	
X		- flow conditions		
X	Wet Wells	- cover on securely	W/L in Manhole 15 (pump chamber 3) still high	
X		- condition of cover	pump not running	
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	None	
X		- bare areas		
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

Dave Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: N Tonawanda (DST) ~~Wheatfield,~~ New York

DATE: 03/25/15 (MM DD YY)

INSPECTOR(S): A. Iwanicki D. Tyran

	Item	*Inspect For*	*Action Required*	*Comments*
2.	**Landfill Cap (continued)**			
☑	Access Roads	- bare areas, dead/dying veg.	None	
☒		- erosion		
☒		- potholes or puddles		
☒		- obstruction		
3.	**Wetlands (Area "F")**	- dead/dying vegetation		
		- change in water budget		
		- general condition of wetlands		
4.	**Other Site Systems**			
☐	Perimeter Fence	- integrity of fence	NA	
☐		- integrity of gates		
☐		- integrity of locks		
☐		- placement and condition of signs		

FORM 17

David J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: N. Tonawanda (top) ~~Wheatfield,~~ New York

DATE: 03/25/15 (MM DD YY)

INSPECTOR(S): A. Iwanicki D. Tyran

	Item	Inspect For	Action Required	Comments
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
	Gas Vents	- intact / damage	NA	
X	Wells	- locks secure	None	
X	Shoreline			

FORM 17

David J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 04 23 15 (MM DD YY)

INSPECTOR(S): D. Tyran K. VanderMeer

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	None	
X		- condition of cover		
X		- condition of inside of manhole		
X		- flow conditions		
X	Wet Wells	- cover on securely	W/L in MH 15 (pump chamber 3) still High	
X		- condition of cover	pump Not running	
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	None	
X		- bare areas		
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

CRA 7987 (24)

Dave Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 04/23/15th (MM DD YY)

INSPECTOR(S): D. Tyran K. VanderMeer

Item	*Inspect For*	*Action Required*	*Comments*
2. Landfill Cap (continued)			
[X] Access Roads	- bare areas, dead/dying veg.	None	
[X]	- erosion		
[X]	- potholes or puddles		
[X]	- obstruction		
3. Wetlands (Area "F")	- dead/dying vegetation		
	- change in water budget		
	- general condition of wetlands		
4. Other Site Systems			
[ ] Perimeter Fence	- integrity of fence	NA	
[ ]	- integrity of gates		
[ ]	- integrity of locks		
[ ]	- placement and condition of signs		

FORM 17

CRA 7987 (24)

David J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 04/23/15 (MM DD YY)

INSPECTOR(S): D. Tyran K. VanderMeer

	Item	Inspect For	Action Required	Comments
4.	**Other Site Systems (continued)**			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions	Large tree trunk 18"Ø 40' Long blocking River North outfall	
X		- dead/dying vegetation		
X		- cable concrete/gabion mats and riprap		
X	Culverts	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	Gabion mats exposed @ various points along shoreline	

FORM 17

Dave J. Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 05/29/15 (MM DD YY)

INSPECTOR(S): D. Tyran

	Item	*Inspect For*	*Action Required*	*Comments*
1.	**Perimeter Collection System/Off-Site Forcemain**			
X	Manholes	- cover on securely	None	
X		- condition of cover		
X		- condition of inside of manhole		
X		- flow conditions		
X	Wet Wells	- cover on securely	w/L in MH 15 (pump chamber 3) high	
X		- condition of cover	pump sitting on grating out of water	
X		- condition of inside of wet well		
2.	**Landfill Cap**			
X	Vegetated Soil Cover	- erosion	None	
X		- bare areas		
X		- washouts		
X		- leachate seeps		
X		- length of vegetation		
X		- dead/dying vegetation		

FORM 17

CE.A 7987 (24)

Dave J Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 05/29/15 (MM DD YY)

INSPECTOR(S): D. Tyran

	Item	*Inspect For*	*Action Required*	*Comments*
2.	**Landfill Cap (continued)**			
[X]	Access Roads	- bare areas, dead/dying veg.	None	
[X]		- erosion		
[X]		- potholes or puddles		
[X]		- obstruction		
3.	**Wetlands (Area "F")**	- dead/dying vegetation	None	
		- change in water budget		
		- general condition of wetlands		
4.	**Other Site Systems**			
[ ]	Perimeter Fence	- integrity of fence	N/A	
[ ]		- integrity of gates		
[ ]		- integrity of locks		
[ ]		- placement and condition of signs		

FORM 17

CRA 7987 (24)

D. J. Tyran

GRATWICK-RIVERSIDE PARK SITE
MONTHLY INSPECTION LOG

PROJECT NAME: Gratwick-Riverside Park Site

LOCATION: North Tonawanda, New York

DATE: 05/29/15 (MM DD YY)

INSPECTOR(S): D. Tyran

	Item	Inspect For	Action Required	Comments
4.	Other Site Systems (continued)			
X	Drainage Ditches/ Swale Outlets	- sediment build-up	None	
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions	Large tree trunk blocking River North of Falls	
X		- dead/dying vegetation	None	
X		- cable concrete/ gabion mats and riprap		
X	Culverts	- sediment build-up		
X		- erosion		
X		- condition of erosion protection		
X		- flow obstructions		
X	Gas Vents	- intact / damage		
X	Wells	- locks secure		
X	Shoreline Stabilization	- condition of gabion mats and riprap	Gabion mats exposed @ various points along Shoreline	

FORM 17

CRA 7987 (24)

Dave J. Tyran

Appendix C
QA/QC Reviews and Data Usability Summary

CONESTOGA-ROVERS & ASSOCIATES

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MEMORANDUM

TO: Klaus Schmidtke

REF. NO.: 7987

FROM: Susan Scrocchi/bjw/18 SCS

DATE: January 21, 2015

RE: **Analytical Results and Reduced Validation**
Waste Water Treatment Plant Sampling
Gratwick-Riverside Park
North Tonawanda, New York
October 2014

1.0 Introduction

The following document details a reduced validation of analytical results for one effluent sample collected in support of the semi-annual monitoring program at the North Tonawanda Wastewater Treatment Plant during October 2014. Samples were submitted to TestAmerica Laboratory, located in Amherst, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard Conestoga--Rovers & Associates (CRA) report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, duplicate data, recovery data from surrogate spikes, laboratory control samples (LCS), matrix spikes (MS), and field QC samples.

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 documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", United States Environmental Protection Agency (USEPA) 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

These items will subsequently be referred to as the "Guidelines" in this Memorandum.

2.0 Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

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

3.0 Laboratory Method 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 blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4.0 Surrogate Spike Recoveries - Organic Analyses

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

All samples submitted for volatile and semi-volatile determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

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

5.0 Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

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

The LCS or LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision (where applicable) with the exception of high SVOC recoveries. All associated positive sample results were qualified as estimated (see Table 4) and all non-detect results would not have been impacted by the implied high bias.

6.0 Matrix Spike Analyses - Inorganic Analyses

To evaluate the effects of sample matrices on the preparation, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples. For this study, MS samples were prepared and analyzed only for method 245.1.

All MS analyses performed were acceptable, demonstrating acceptable analytical accuracy.

7.0 Duplicate Sample Analyses – Inorganic Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed for method SM2540C. The duplicate results were evaluated per the "Guidelines". All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8.0 Field QA/QC Samples

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

Trip Blank Sample Analysis

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

9.0 Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the practical quantitation limit (PQL) but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the PQL in Table 2 for all parameters except SVOCs. The laboratory reported to project specific reporting limits. These limits were less than the PQL, but greater than or equal to the MDL.

10.0 Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the qualifications noted.

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
OCTOBER 2014

					Analysis/Parameters									
Sample Identification	***Location***	***Matrix***	***Collection Date (mm/dd/yyyy)***	***Collection Time (hr:min)***	***TAL Metals***	***Chloride/Sulfate***	***Nitrate/Nitrite***	***Site-Specific VOCs***	***Site-Specific SVOCs***	***Alkalinity***	***Total Hardness***	***TDS***	***Sulfide***	***Comments***
GRP	Effluent	Water	10/07/2014	8:00	X	X	X	X	X	X	X	X	X	
TRIP BLANK	-	-	10/07/2014	-				X						Trip Blank

Notes:

TAL - Target Analyte List
VOCs - Volatile Organic Compounds
SVOCs - Semi-Volatile Organic Compounds
TDS - Total Dissolved Solids

TABLE 2

ANALYTICAL RESULTS SUMMARY
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
OCTOBER 2014

	Sample Location:	***Effluent***
	Sample ID:	***GRP***
	Sample Date:	***10/7/2014***
Parameters	***Units***	
Volatile Organic Compounds		
1,1,1-Trichloroethane	µg/L	5.0 U
1,1-Dichloroethane	µg/L	5.0 U
1,2-Dichloroethane	µg/L	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	25 U
Acetone	µg/L	25 U
Benzene	µg/L	5.0 U
Chlorobenzene	µg/L	5.1
Ethylbenzene	µg/L	5.0 U
Methylene chloride	µg/L	5.0 U
Styrene	µg/L	5.0 U
Tetrachloroethene	µg/L	5.0 U
Toluene	µg/L	13
trans-1,2-Dichloroethene	µg/L	5.4
Trichloroethene	µg/L	26
Vinyl chloride	µg/L	5.0 U
Xylenes (total)	µg/L	10 U
Semi-volatile Organic Compounds		
1,2-Dichlorobenzene	µg/L	4.8 U
1,4-Dichlorobenzene	µg/L	9.4
2,4-Dimethylphenol	µg/L	7.8 J
2-Methylphenol	µg/L	5.3
4-Methylphenol	µg/L	7.4
Di-n-octyl phthalate (DnOP)	µg/L	4.6 U
Naphthalene	µg/L	0.82 U
Phenol	µg/L	22
Metals		
Aluminum	mg/L	0.20 U
Antimony	mg/L	0.020 U
Arsenic	mg/L	0.010 U
Barium	mg/L	0.067
Beryllium	mg/L	0.0020 U
Cadmium	mg/L	0.0010 U
Chromium	mg/L	0.0040 U
Copper	mg/L	0.014

TABLE 2

ANALYTICAL RESULTS SUMMARY
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
OCTOBER 2014

	Sample Location:	***Effluent***
	Sample ID:	***GRP***
	Sample Date:	***10/7/2014***
Parameters	***Units***	
Metals (Continued)		
Iron	mg/L	0.050 U
Lead	mg/L	0.0050 U
Magnesium	mg/L	1.1
Manganese	mg/L	0.0030 U
Mercury	mg/L	0.00020 U
Nickel	mg/L	0.010 U
Selenium	mg/L	0.015 U
Silver	mg/L	0.0030 U
Sodium	mg/L	233
Zinc	mg/L	0.010 U
General Chemistry		
Alkalinity, bicarbonate	mg/L	5.0 U
Alkalinity, total (as CaCO3)	mg/L	47.3
Ammonia	mg/L	1.12
Biochemical oxygen demand (BOD)	mg/L	20.09
Chemical oxygen demand (COD)	mg/L	75
Chloride	mg/L	386
Cyanide (total)	mg/L	0.005 U
Hardness, carbonate	mg/L	180
Nitrate (as N)	mg/L	0.050 U
Oil and grease	mg/L	0.10 U
pH (water)	s.u.	9.90
Phenolics (total)	mg/L	0.011 U
Phosphorus	mg/L	0.17
Sulfate	mg/L	136
Sulfide	mg/L	3.6
Total dissolved solids (TDS)	mg/L	872
Total kjeldahl nitrogen (TKN)	mg/L	1.68
Total organic carbon (TOC)	mg/L	13.36
Total suspended solids (TSS)	mg/L	2
Volatile suspended solids	mg/L	1

Notes:

J - Estimated Concentration
U - Not present at or above the associated value

TABLE 3

ANALYTICAL METHODS AND HOLDING TIME CRITERIA
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
OCTOBER 2014

Parameter	*Method*	*Matrix*	*Holding Time*	
			Collection to Extraction (Days)	*Collection or Extraction to Analysis (Days)*
VOC	EPA 624[1]	Water	-	14
SVOC	EPA 625[1]	Water	7	40
TAL Metals	EPA 200.7[1]	Water	-	180
Mercury	EPA 245.1[1]	Water	-	28
Chloride/Sulfate	EPA 300.0[1]	Water	-	28
Nitrate/Nitrite	EPA 353.2[1]	Water	-	48 hours
Hardness	SM 2340[2]	Water	-	180
Alkalinity	SM2320B[2]	Water	-	24 hours
TDS	SM2540C[2]	Water	-	7
Sulfide	SM4500-S2-F[2]	Water	-	7

Notes:

[1] - "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, with subsequent revisions
[2] - "Methods for Chemical Analysis of Water and Wastes", USEPA-600/4-79-020, March 1983, with subsequent revisions
VOCs - Volatile Organic Compounds
SVOCs - Semi-Volatile Organic Compounds
TAL - Target Analyte List
TDS - Total Dissolved Solids

TABLE 4

QUALIFIED SAMPLE RESULTS DUE TO OUTLYING LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
OCTOBER 2014

Parameter	*Analyte*	*LCS Date*	*LCS % Recovery*	*LCSD % Recovery*	*RPD (percent)*	*Control Limits*		*Associated Sample ID*	*Qualified Result*	*Units*
						% Recovery	*RPD*			
SVOC	2,4-Dimethylphenol	10/8/2014	124	127	2	32-119	20	GRP	7.8 J	µg/L

Notes:

LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
RPD - Relative Percent Difference
J - Estimated concentration
SVOC - Semi-Volatile Organic Compound

CONESTOGA-ROVERS & ASSOCIATES

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MEMORANDUM

TO:	Klaus Schmidtke	REF. NO.:	007987
FROM:	Susan Scrocchi/mma/19-NF	DATE:	June 25, 2015
RE:	**Analytical Results and Reduced Validation Waste Water Treatment Plant Sampling Gratwick-Riverside Park North Tonawanda, New York April 2015**		

1.0 Introduction

The following document details a reduced validation of analytical results for one effluent sample collected in support of the semi-annual monitoring program at the North Tonawanda Wastewater Treatment Plant during April 2015. Samples were submitted to TestAmerica Laboratory, located in Amherst, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard Conestoga-Rovers & Associates (CRA) report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, duplicate data, recovery data from surrogate spikes, laboratory control samples (LCS), matrix spikes (MS), and field QC samples.

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 documents entitled:

i. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", United States Environmental Protection Agency (USEPA) 540-R-10-011, January 2010
ii. "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

These items will subsequently be referred to as the "Guidelines" in this Memorandum.

2.0 Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

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

3.0 Laboratory Method 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 blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4.0 Surrogate Spike Recoveries - Organic Analyses

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

All samples submitted for volatile and semi-volatile determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

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

5.0 Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

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.

6.0 Matrix Spike Analyses - Inorganic Analyses

To evaluate the effects of sample matrices on the preparation, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples. For this study, MS samples were prepared and analyzed only for method 200.7.

All MS analyses performed were acceptable, demonstrating acceptable analytical accuracy.

7.0 Duplicate Sample Analyses – Inorganic Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed for method SM2540C and SM2340. The duplicate results were evaluated per the "Guidelines". All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8.0 Field QA/QC Samples

No field QA/QC samples were submitted with this investigative sample.

9.0 Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the practical quantitation limit (PQL) but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the PQL in Table 2 for all parameters except SVOCs. The laboratory reported to project specific reporting limits. These limits were less than the PQL, but greater than or equal to the MDL.

10.0 Conclusion

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

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
APRIL 2015

					Analysis/Parameters									
Sample Identification	***Location***	***Matrix***	***Collection Date (mm/dd/yyyy)***	***Collection Time (hr:min)***	***TAL Metals***	***Chloride/Sulfate***	***Nitrate***	***Site-Specific VOCs***	***Site-Specific SVOCs***	***Alkalinity***	***Total Hardness***	***TDS***	***Sulfide***	***Comments***
GRP	Effluent	Water	04/15/2015	9:00	X	X	X	X	X	X	X	X	X	

Notes:

TAL - Target Analyte List
VOCs - Volatile Organic Compounds
SVOCs - Semi-Volatile Organic Compounds
TDS - Total Dissolved Solids

TABLE 2

ANALYTICAL RESULTS SUMMARY
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
APRIL 2015

Sample Location:		***Effluent***
Sample ID:		***GRATWICK RIVERSIDE PARK (GRP)***
Sample Date:		***4/16/2015***
Parameters:	***Units***	
Volatile Organic Compounds		
1,1,1-Trichloroethane	ug/L	5.0 U
1,1-Dichloroethane	ug/L	5.0 U
1,2-Dichloroethane	ug/L	5.0 U
2-Butanone (Methyl ethyl ketone) (MI	ug/L	25 U
Acetone	ug/L	25 U
Benzene	ug/L	5.0 U
Chlorobenzene	ug/L	5.0 U
Ethylbenzene	ug/L	5.0 U
Methylene chloride	ug/L	5.0 U
Styrene	ug/L	5.0 U
Tetrachloroethene	ug/L	5.0 U
Toluene	ug/L	5.0 U
trans-1,2-Dichloroethene	ug/L	5.0 U
Trichloroethene	ug/L	5.0
Vinyl chloride	ug/L	5.0 U
Xylenes (total)	ug/L	10 U
Semi-volatile Organic Compounds		
1,2-Dichlorobenzene	ug/L	4.8 U
1,4-Dichlorobenzene	ug/L	7.0
2,4-Dimethylphenol	ug/L	13
2-Methylphenol	ug/L	6.2
4-Methylphenol	ug/L	59
Di-n-octyl phthalate (DnOP)	ug/L	4.6 U
Naphthalene	ug/L	0.97
Phenol	ug/L	4.0
Metals		
Aluminum	mg/L	0.20 U
Antimony	mg/L	0.020 U
Arsenic	mg/L	0.010 U
Barium	mg/L	0.092
Beryllium	mg/L	0.0020 U
Cadmium	mg/L	0.0010 U
Chromium	mg/L	0.0040 U
Copper	mg/L	0.010 U
Iron	mg/L	0.17
Lead	mg/L	0.0050 U
Magnesium	mg/L	6.5
Manganese	mg/L	0.018
Mercury	mg/L	0.00020 U
Nickel	mg/L	0.010 U
Selenium	mg/L	0.015 U
Silver	mg/L	0.0030 U
Sodium	mg/L	361
Zinc	mg/L	0.010 U

TABLE 2

ANALYTICAL RESULTS SUMMARY
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
APRIL 2015

Sample Location:		***Effluent***
Sample ID:		***GRATWICK RIVERSIDE PARK (GRP)***
Sample Date:		***4/16/2015***
Parameters:	***Units***	
General Chemistry		
Alkalinity, bicarbonate	mg/L	40.0
Alkalinity, total (as CaCO3)	mg/L	40.0
Ammonia	mg/L	0.84
Biochemical oxygen demand (BOD)	mg/L	13.34
Chemical oxygen demand (COD)	mg/L	50 U
Chloride	mg/L	662
Cyanide (total)	mg/L	0.005 U
Hardness	mg/L	340
Nitrate (as N)	mg/L	0.050 U
Oil and grease	mg/L	0.10 U
pH (water)	s.u.	9.20
Phenolics (total)	mg/L	0.085 U
Phosphorus	mg/L	0.10
Sulfate	mg/L	216
Sulfide	mg/L	2.0
Total dissolved solids (TDS)	mg/L	1430
Total kjeldahl nitrogen (TKN)	mg/L	1.12
Total organic carbon (TOC)	mg/L	5.0 U
Total suspended solids (TSS)	mg/L	16

Notes:
U - Not detected at the associated reporting limit.

TABLE 3

ANALYTICAL METHODS AND HOLDING TIME CRITERIA
WASTE WATER TREATMENT PLANT SAMPLING
GRATWICK-RIVERSIDE PARK
NORTH TONAWANDA, NEW YORK
APRIL 2015

Parameter	*Method*	*Matrix*	*Holding Time*	
			Collection to Extraction (Days)	*Collection or Extraction to Analysis (Days)*
VOC	EPA 624[1]	Water	-	14
SVOC	EPA 625[1]	Water	7	40
TAL Metals	EPA 200.7[1]	Water	-	180
Mercury	EPA 245.1[1]	Water	-	28
Chloride/Sulfate	EPA 300.0[1]	Water	-	28
Nitrate	EPA 353.2[1]	Water	-	48 hours
Hardness	SM 2340[2]	Water	-	180
Alkalinity	SM2320B[2]	Water	-	24 hours
TDS	SM2540C[2]	Water	-	7
Sulfide	SM4500-S2-F[2]	Water	-	7

Notes:

[1] - "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, with subsequent revisions
[2] - "Methods for Chemical Analysis of Water and Wastes", USEPA-600/4-79-020, March 1983, with subsequent revisions
VOCs - Volatile Organic Compounds
SVOCs - Semi-Volatile Organic Compounds
TAL - Target Analyte List
TDS - Total Dissolved Solids

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MEMORANDUM

TO:	Klaus Schmidtke	REF. NO.:	007987
FROM:	Susan Scrocchi/adh/20	DATE:	June 26, 2015
RE:	**Analytical Results and Reduced Validation Annual Groundwater Monitoring Gratwick-Riverside Park Site North Tonawanda, New York June 2015**		

1.0 Introduction

This Data Usability Summary Report (DUSR) has been prepared per the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation DER-10, Technical Guidance for the Site Investigation and Remediation, Appendix 2B-Guidance for the Data Deliverables and Development of Data Usability Summary Reports, May 2010.

The following document details a reduced validation of analytical results for groundwater samples collected in support of the Annual Monitoring Program at the Gratwick-Riverside Park Site (Site) during June 2015.

2.0 Analytical Methodologies and Data Validation

Samples were submitted to TestAmerica Laboratory (TA), located in Amherst, New York. Samples were analyzed for:

i) Selected Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method SW-846 8260
ii) Selected Semi-volatile Organic Compounds (SVOCs) by USEPA Method SW-846 8270

The quality assurance/quality control (QA/QC) criteria by which these data have been assessed are outlined in the analytical methods and the document entitled "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008.

The reduced validation included a review of completeness of all required deliverables to determine if the data are within acceptable QC limits and specification. These included reviews of holding times, instrument tunes, calibration summaries, blanks, spike recoveries, field duplicate analyses, and surrogate/internal

standard recoveries. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, QC summary forms, and calibration summary forms.

A summary of qualified data is presented in Table 1.

3.0 Data Deliverable Completeness

A full deliverable data package (NYSDEC Analytical Services Protocol [ASP] Category B or equivalent) was provided by the laboratory, including all reporting forms and raw data necessary to fully evaluate and verify the reported analytical results.

4.0 Sample Holding Time and Preservation

Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and 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).

5.0 Instrument Tuning

The Gas Chromatograph/Mass Spectrometer (GC/MS) was properly tuned and calibrated prior to sample analyses.

6.0 Initial and Continuing Calibration

Initial and continuing calibration summary forms were reviewed for VOCs and SVOCs.

The proper calibration procedures were followed, and all compounds met the method criteria for sensitivity and linearity.

7.0 Laboratory Method 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 blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

8.0 Surrogate Spike Recoveries - Organic Analyses

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

All samples submitted for volatile and semi-volatile determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

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

9.0 Laboratory Control Sample Analyses

Laboratory control samples (LCS) are prepared and 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 the compounds specified in the method. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

10.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the extraction or digestion 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 relative percent difference (RPD) between the MS and MSD is used to assess analytical precision.

MS/MSD analyses were performed using investigative sample OGC3.

The MS/MSD samples were spiked with the compounds specified in the method. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

11.0 Field QA/QC Samples

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

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.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, one field duplicate sample was collected and submitted "blind" to the laboratory. 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 practical quantitation limit (PQL), the evaluation criterion is one times the PQL value for water samples.

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

12.0 Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the PQL but greater than the MDL were qualified as estimated (J) in Table 1 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the PQL in Table 1.

13.0 Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 1 are acceptable without qualification.

TABLE 1

ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING
GRATWICK-RIVERSIDE PARK SITE
NORTH TONAWANDA, NEW YORK
JUNE 2015

Sample Location:		*MW8*	*MW8*	*MW9*	*OGC3*	*OGC6*	*OGC7*
Sample ID:		*WG-7987-052915-SG-001*	*WG-7987-052915-SG-002*	*WG-7987-052915-SG-004*	*WG-7987-052915-SG-003*	*WG-7987-052915-SG-006*	*WG-7987-052915-SG-005*
Sample Date:		*5/29/2015*	*5/29/2015 (Duplicate)*	*5/29/2015*	*5/29/2015*	*5/29/2015*	*5/29/2015*
Parameters	***Units***						
Volatile Organic Compounds							
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	25 U	25 U	50 U	50 U	50 U	5.0 U
Acetone	µg/L	25 U	25 U	50 U	50 U	50 U	5.0 U
Benzene	µg/L	2.8 J	2.9 J	7.0 U	7.0 U	7.0 U	0.70 U
Chlorobenzene	µg/L	4.6 J	4.8 J	10 U	10 U	10 U	1.0 U
Ethylbenzene	µg/L	3.9 J	3.9 J	10 U	10 U	10 U	1.0 U
Methylene chloride	µg/L	5.0 U	5.0 U	10 U	10 U	10 U	1.0 U
Tetrachloroethene	µg/L	2.9 J	2.8 J	10 U	10 U	180	0.38 J
Toluene	µg/L	4.0 J	4.1 J	5.3 J	10 U	8.1 J	1.9
trans-1,2-Dichloroethene	µg/L	5.3	6.1	10 U	10 U	10 U	1.0 U
Trichloroethene	µg/L	17	17	10 U	10 U	99	5.1
Vinyl chloride	µg/L	5.0 U	5.0 U	10 U	10 U	10 U	0.94 J
Xylenes (total)	µg/L	5.4 J	5.0 J	20 U	20 U	20 U	0.95 J
Semi-volatile Organic Compounds							
1,2-Dichlorobenzene	µg/L	1.2 J	0.91 J	1.2 J	0.47 J	9.3 U	9.7 U
1,4-Dichlorobenzene	µg/L	12	11	0.48 J	9.2 U	9.3 U	9.7 U
2,4-Dimethylphenol	µg/L	18	16	62 J	4.1 J	9.3 U	9.7 U
2-Methylphenol	µg/L	21	19	13	23	4.8 J	9.7 U
4-Methylphenol	µg/L	27	24	200	7.6 J	0.88 J	9.7 U
Di-n-octyl phthalate (DnOP)	µg/L	9.7 U	9.4 U	9.3 U	9.2 U	9.3 U	9.7 U
Naphthalene	µg/L	9.7 U	9.4 U	9.3 U	9.2 U	0.89 J	9.7 U
Phenol	µg/L	3.3 J	2.7 J	16	44 J	0.71 J	9.7 U

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Appendix D
Laboratory Deliverables (on CD)

Appendix E
NYSDEC Correspondence

7987

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue, Buffalo, New York 14203-2915
Phone: (716) 851-7220 Fax: (716) 851-7226
Website: www.dec.ny.gov

Joe Martens
Commissioner

March 12, 2015

The Honorable Arthur G. Pappas
Mayor of North Tonawanda
City Hall
216 Payne Avenue
North Tonawanda, New York 14120

Dear Mayor Pappas,

Groundwater Withdrawal System
Gratwick Riverside Park
NYSDEC Site No. 932060

The New York State Department of Environmental Conservation (NYSDEC) is responsible for enforcement of Article 27, Title 13 of the Environmental Conservation Law of the State of New York ("ECL"), entitled "Inactive Hazardous Waste Disposal Sites." The Gratwick Riverside Park Site is an inactive hazardous waste disposal site that has been listed in the Registry of Inactive Hazardous Disposal Sites in New York State as Site Number 932060. Gratwick Riverside Park underwent remediation and was reclassified to a Class 4 on July 14, 2008. Class 4 is a site that has been properly closed, but requires continued site management; operation, maintenance and monitoring (OM&M). The City of North Tonawanda (City) is responsible for OM&M at this site. One of the Engineering Controls (EC) is the Groundwater Withdrawal System for the collection of leachate and its' conveyance to the municipal wastewater treatment plant. The removal and treatment of the chemically laden leachate is a critical component of the remedial system for the protection of the Niagara River. We have reason to believe that this EC has failed. Pump Station 3 has been down for nearly two years and Pump Stations 1 & 2 have been down for the last three months.

On December 2, 2014 the City asked their consultant; Conestoga Rovers and Associates (CRA) for a proposal to perform a pilot program to clean the resin-like deposits in the downstream portion of the force main. In addition, the City also asked CRA to evaluate the current pumping scheme and make recommendations on new pump specifications in an effort to save on energy and pump replacement costs. The Department agreed with this approach and asked for a schedule of these events on January 7, 2015. To date we have not received a response from the City. On February 13, 2015, we were informed that new pumps were on order and requested that they be installed and brought online as soon as possible. We were also informed that the City planned to meet with the Potential Responsible Party (PRP) Group that participated in the original remediation of the site, for assistance/support in operating and maintaining the Groundwater Withdrawal System. We asked for the opportunity to attend the meeting and to notify us of the date and time. Again, there has been no response received from the City.

The NYSDEC has determined that the Groundwater Withdrawal System is not adequately protecting the environment. You are required to submit a Corrective Measures Work Plan, including a schedule for the completion of the planned work, within 30 days of receipt of this letter.

Should you have any questions, please feel free to contact me at (716) 851-7220.

Sincerely,

Gregory P. Sutton, P.E.
Regional Hazardous Waste Remediation Engineer

GPS/BS/bb

ec: Mr. Dale Marshall - City Engineer
Mr. Brian Sadowski, NYSDEC, Region 9
Mr. Matt Forcucci, NYSDOH

City of North Tonawanda
Department of Engineering
City Hall, 216 Payne Avenue
North Tonawanda, NY 14120-5493
www.northtonawanda.org

Dale W. Marshall, P. E.
City Engineer
Phone: (716) 695-8565
Fax: (716) 695-8568

April 9, 2015

Gregory P. Sutton, P.E.
Regional Hazardous Waste Remediation Engineer
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203-2999

Re Groundwater Withdrawal System
Gratwick Riverside Park Site, North Tonawanda
Corrective Measures Plan

Dear Mr. Sutton,

Prior to the Mayor of the City of North Tonawanda receiving your March 12, 2015 letter of concern regarding the operation of the groundwater withdrawal system at the Gratwick Riverside Park Site, pumps had been ordered by the city and were in the process of being installed.

The city's Department of Public Works ordered two (2) 7.5 HP pumps on January 15th for Pump Station No. 1 (MH- 3), that were delivered on February 19th, one of which was installed on February 20th with the other pump held as a spare. After some difficulty getting the pump to seat properly, flow was immediately observed at the meter building, as well as visually at the downstream discharge point.

New 3 HP pumps were ordered on February 5th for the other two pump stations and delivered to the city on March 11th. The DPW completed the new overload wiring and pump installation at P.S. No. 2 (MH 9) on March 17th . The pump became operational later that afternoon.

On Thursday, March 19th, the new pump was installed at P.S. No. 3 (MH 15). The crew had problems getting the pump to seat properly at this installation. If you recall, this pump station's wet well was pumped down last September and the sediment was sucked out by Kandey Company with their vac truck. At that time, we were suspecting that the downstream portion of the last 600 feet of the 6 inch forcemain, from the pump station to the discharge point at the marina, may have been restricted with the resin like deposits that have been encountered. As it turns out, this might not be the case. We suspect now that the pump is recirculating back into the wet well because of some mechanical problem with the connection.

In the next two weeks, we intend to pump down the wet well at P.S. No. 3, which is easily accomplished with a hose connection to the piping in the meter building 200 feet away. Once this is done, we will have a contractor enter into the confined space to correct the problem at the pump connection to the forcemain and also inspect the check valve.

At this point, the city feels that the work performed thus far in correcting the pump problems falls within the category of normal operation and maintenance of the GRP facilities as spelled out in

the Agreement for Joint Performance of Remedial Design/Remedial Action entered amongst the Performing Parties. The city currently finds no reason to meet with the PPs to discuss the possibility of performing an expensive rehabilitation of the collection and discharge system since the pumps are discharging properly with adequate flowrates being obtained and recorded.

Although the pumping capability of the collection system was down over the late winter months this year, at no point was the environment not adequately protected. The 36 inch thick clay bentonite barrier slurry wall, which is keyed into the confining soil layer below, provides the ultimate protection. The average temperature for the month of February was 10.2 degrees Fahrenheit, with a frost penetrating the ground to a depth over 42 inches. Absolutely no melting occurred to cause groundwater elevations to rise. Water elevations observed within the wet wells during this time were several feet below the top of the slurry wall elevation of 568.50 feet amsl.

This letter to you will serve as the city's corrective measures work plan you requested, within the 30 day period as ordered.

If you have any questions, please do not hesitate to contact me at (716) 695-8565.

Very truly yours,

Dale W. Marshall, P.E.
City Engineer

DWM:dwm

cc: Arthur G. Pappas, Mayor (electronic copy)
Brad Rowles, Superintendent of Public Works (electronic copy)
Amanda Reimer, Assistant City Accountant (electronic copy)
Brian Sadowski, NYSDEC Region 9 (electronic copy)
Mathew Forcucci, NYSDOH (electronic copy)
Klaus Schmidtke, CRA (electronic copy)
Michael Marino, CRA (electronic copy)