December 22, 2016 Reference No. 11109628

Mr. Mike Hinton
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Mr. Hinton:

Re: 2016 Periodic Review Report
Cascades Containerboard Packaging Inc. - Frontier Site (formerly Norampac)

Pursuant to the Site Management Plan - Frontier Chemical Site, Niagara Falls, New York (SMP) dated April 23, 2014 by GHD (formerly Conestoga-Rovers & Associates [CRA]), this correspondence provides the 2016 Periodic Review Report (PRR) for the Cascades Containerboard Packaging Inc. (Cascades) Facility (Former Frontier Chemical Site) located in Niagara Falls, New York. This PRR and Institutional Controls/Engineering Controls (IC/EC) Certification presents the field activities and monitoring results for the annual monitoring period of November 18, 2015 through November 18, 2016.

1. Introduction

The Frontier Chemical Royal Avenue Site Potentially Responsible Party (PRP) Group (the Frontier Group) entered into an Order on Consent (Index #89-0571-00-01, executed on August 15, 2008) with the New York State Department of Environmental Conservation (NYSDEC) to perform additional Site characterization and remediation of the conditions at the Cascades Containerboard Packaging site (Site). The Site was previously referred to as the Norampac Facility in the 2015 PRR. The Frontier Group consisted of the Site owner and numerous parties who performed the additional investigations and completed the remediation of the Site in accordance with the approved Remedial Design Report (CRA-February 2013). The Site is now owned and maintained by Cascades. The Site is a 9-acre property located in an industrialized area of Niagara Falls, New York.

Following completion of the additional Site characterization, the Frontier Group worked with the NYSDEC to develop and implement the various components of the Site remedy. The overburden and shallow bedrock groundwater remedy was implemented as specified in the 2006 Record of Decision (ROD). The deep bedrock groundwater, designated as OU2, was investigated, and a remedial action consisting of monitored natural attenuation was determined to be the appropriate remedy and set forth in the OU2 ROD (March 2011). For the source area soil, a remedy consisting of excavation and ex situ thermal treatment was selected and implemented as the appropriate remedy.

After completion of the remedial work described in the Remedial Design Report, the Remedial Action Objectives were met although some minimal residual contamination remains in place at subsurface locations on the Site, which is hereafter referred to as "residual material". A SMP was prepared to manage

the residual material at the Site until the Environmental Easement is removed in accordance with ECL Article 71, Title 36.

This 2016 Periodic Review Report presents the measures taken in 2016 to evaluate the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site and to assess the conditions of the asphalt/concrete and soil cover system at the Site.

2. Site Overview

The Cascades Facility is located in an industrial area of the City of Niagara Falls, County of Niagara, New York and is identified as Block 1 and Lot 6 on the Niagara County Tax Map (160.09). The Site is an approximately 9-acre area parcel bordered to the north by property identified as owned by Sentry Metals, to the northwest by Cascades, to the west by the Greenpac Mill, to the south by Elkem Metal Company, and to the east by 47th Street, beyond which is an industrial site (Strator).

After Site remediation activities were completed in early 2014, the SMP provided a series of Engineering Controls (ECs) and Industrial Controls (ICs). The ROD requires that the Site surface either be covered with the existing asphalt or concrete surface or 1 foot of clean fill material. At the completion of excavation activities associated with the source area soil remediation that was completed in 2014, the cover system was made compliant with the ROD. The existing undisturbed asphalt and concrete-covered areas were allowed to remain "as is". All previously existing soil cover areas and the area disturbed due to the excavation of the source area soil were covered with clean fill material. Recycled concrete and hard demolition material from the Site remediation project were also used as part of the 1 foot of clean surface material that was placed over all previously existing and post-excavation soil cover areas. The recycled concrete/demolition material was crushed to 2-inch-minus prior to placement and compacted in place. The remainder of the 1 foot of clean cover was completed using imported crushed stone from a quarry.

Adherence to these ICs on the Site is required by the Environmental Easement and is being implemented under the SMP. The ICs that are implemented are as follows:

- Compliance with the Environmental Easement and the SMP by the Grantor (Site owner) and the Grantor's successors and assigns (Cascades).
- All ECs must be operated and maintained as specified in the SMP.
- All ECs on the Controlled Property must be inspected at a frequency and in the manner defined in the SMP.
- Groundwater and other environmental or public health monitoring must be performed as defined in the SMP.
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in the manner defined in the SMP.

ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The Site has a series of ICs in the form of Site restrictions. Adherence to these ICs is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The industrial zoned property may only be used for industrial use provided that the long-term ECs and ICs included in the SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted, restricted residential, or commercial use without additional evaluation (including possible additional remediation) and amendment of the Environmental Easement, as approved by the NYSDEC.
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP.
- The use of the groundwater underlying the property as a source of potable or process water is prohibited without treatment rendering it safe for the intended use as determined by the NYSDEC, New York State Department of Health (NYSDOH), or Niagara County Health Department.
- The potential for vapor intrusion must be evaluated for any building developed on the Site in the future, and any potential impacts that are identified must be monitored or managed through implementation of appropriate vapor mitigation measures.
- Vegetable gardens and farming on the property are prohibited.
- The Site owner will submit to NYSDEC a written statement that certifies, under penalty of perjury, that:
  - Controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC.
  - Nothing has occurred that impairs the ability of the controls to protect public health and the environment or that constitutes a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

3. Evaluate Remedy Performance, Effectiveness, and Protectiveness

In accordance with the SMP, annual inspections are made of the asphalt/concrete cover system, soil cover system, and monitoring wells at the Site. The 2016 annual inspection was conducted on October 24, 2016. A copy of the annual inspection report is presented in Attachment A. The 2016 inspection shows that the asphalt/concrete cover system is in good condition. The inspection also noted that areas of fenceline along both Royal Avenue and 47th Street were repaired in between the 2015 and 2016 Site inspections. The inspection indicated that well MW88-13A requires repairs to the well casing,

which is broken at the ground surface. Those repairs will be made in 2017 and will be documented in the 2017 Periodic Review Report.

4. Monitoring Plan Compliance

Commencing in November 2010, groundwater samples have been collected on a semiannual basis from eight on-Site wells in the A-Zone and B-Zone of the bedrock formation at the Site, in accordance with the monitoring plan provided in the SMP. The results of the semiannual groundwater monitoring were used to calculate the volume of groundwater and the chemical loading associated with the groundwater that discharges into the Falls Street Tunnel and the 47th Street Tunnel, which are located immediately adjacent to the Cascades Site. Semiannual Groundwater Discharge Reports are submitted to the Niagara Falls Water Board (NFWB). In addition to the semiannual groundwater sampling, annual groundwater samples were collected from three on-Site deep groundwater monitoring wells (C-Zone). As stated in the SMP, the annual sampling of the deep groundwater monitoring wells will continue for a period of 5 years, starting in 2014 and continuing until 2018. Thereafter, a determination will be made as to the need for and frequency of future sampling.

4.1 Semiannual Groundwater Sampling

Semiannual groundwater sampling was performed on April 6, 2016 and October 25-26, 2016. The eight wells were sampled for Target Compound List (TCL) volatile organic compounds (VOCs), Target Analyte List (TAL) metals, and total phenols and in accordance with Environmental Protection Act (EPA) Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. The calculated groundwater volumes and chemical loadings were presented in the Semiannual Groundwater Discharge Reports submitted to the NFWB on May 19, 2016 and November 30, 2016. The 2016 Semiannual Groundwater Discharge Reports are presented in Attachment B. There were no exceedances of the discharge limitations and monitoring requirements in either the May or December reports.

For both the May 2016 and November 2016 Semiannual Groundwater Discharge Reports, the calculated groundwater volumes and chemical loadings were compared to the discharge limitations and monitoring requirements presented in the NFWB Significant Industrial User (SIU) Permit #78, which was issued on October 1, 2015 by the NFWB to the Norampac-Frontier Site. SIU Permit #78 was revised on August 31, 2016 to accommodate the corporate name change from "Norampac Industries Inc. Niagara Falls Division" to "Cascades Containerboard Packaging Inc. – Frontier Site". SIU Permit #78 was further revised on September 6, 2016 in order to increase the daily maximum groundwater flow from 3,600 gallons per day to 4,000 gallons per day. There were no other changes to the limitations and requirements from the previous revision of SIU Permit #78.

A copy of the revised SIU Permit #78 is presented as Attachment C.

4.2 Annual Groundwater Sampling

Annual sampling of three C-Zone wells (MW1-C-08, MW2-C-08, and MW3-C-08) was conducted on October 25-26, 2016. The wells were sampled in order to assess the bedrock groundwater quality over time. The wells were sampled for VOCs in accordance with EPA Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. Table 1 presents the 2016 analytical results for the groundwater samples from the three C-Zone wells.

The C-Zone wells had previously been sampled in December 2008 and March-April 2009, as described in the Remedial Pre-Investigation Design Report (CRA, September 2010), as well as in October 2014 and October 2015. Table 2 shows the 2016 analytical results for the three C-Zone wells as compared to the results from the 2008, 2009, 2014, and 2015 samples, as well as the New York State Technical and Operational Guidance Series (NYS TOGs) guidance values and standards. A discussion of the sample results for the three wells is presented below.

- **MW1-C-08** - As seen in Table 2, the 2016 sample from MW1-C-08 had results that were below the NYS TOGs standards, as well as below the results from 2008, 2009, 2014, and 2015.
- **MW2-C-08** - The 2016 sample results from MW2-C-08 exceeded the NYS TOGS standards for 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, benzene, and chlorobenzene. The 2016 results at MW2-C-08 were also slightly higher for those parameters than the 2008, 2009, 2014, and 2015 samples, with the exception of benzene (which was lower than the 2008 and 2009 samples, but higher than the 2014 and 2015 samples).
- **MW3-C-08** - The 2016 sample results for MW3-C-08 exceeded the NYS TOGs standards for 1,2-dichlorobenzene,1,3-dichlorobenzene 1,4-dichlorobenzene, and chlorobenzene, and the results for those parameters were also higher than during the 2008, 2009, 2014, and 2015 sampling events. While the 2015 sample at MW3-C-08 had a cis-1,2-dichloroethene detection of 45 micrograms per liter (µg/L) and a vinyl chloride detection of 9 µg/L, the 2016 sample had no detections of cis-1,2-dichloroethene and vinyl chloride.

In accordance with the current schedule, semiannual sampling events will occur in April and October 2017. Semiannual groundwater discharge reports will be submitted to the NFWB in May and November 2017. The next annual sampling event, as well as the annual inspection, will occur in October 2017, followed by the preparation and submission of the next Periodic Review Report.

4.2.1 Total Concentration Trends

GHD compared the 2016 total VOC concentrations from the three C-Zone wells (MW1-C-08, MW2-C-08, and MW3-C-08) to the historical total VOC concentrations at those wells. Figure 1 shows the total VOC concentrations at MW1-C-08 since measurements began in December 2008. Figure 2 shows the total VOC concentrations at MW2-C-08 since 2008, and Figure 3 shows the same for MW3-C-08.

Figure 1 shows that total VOC concentrations at MW1-C-08 have remained below 6 µg/L since the 2013/2014 source area soil remediation activities were completed, with a total VOC concentration of

0.75 µg/L in 2016. Figure 2 shows an increase of total VOCs at MW2-C-08 since the 2013/2014 remediation activities were completed, with the increase continuing in 2016, as the total VOC concentration at MW2-C-08 was 210.8 µg/L in 2016. Figure 3 shows that while the 2016 total VOC concentration at MW3-C-08 exceeds the total VOC concentrations from 2008 through 2014, the total VOC concentration decreased from 2015 to 2016.

4.2.2 Loading to the Sanitary Sewer System

As discussed in Section 4.1, semiannual discharge reports were submitted to the NFWB in May and November 2016. The discharge reports are included in Attachment B. Table 4 of the November 2016 discharge report lists the total chemical flux from all the A-Zone and B-Zone wells along Royal Avenue and 47th Street, in order to determine the chemical loading (with regard to VOCs) to the tunnel sewer system. Based on the calculated loadings from the Royal Avenue West Side Mass Flux (Zone A), the Royal Avenue East Side Mass Flux (Zone A), the 47th Street Mass Flux (Zone A), and the 47th Street Mass Flux (Zone B), the total chemical loading (VOCs) to the tunnel sewer system for the November 2016 reporting period was 0.0741 pounds/day. Table 4 of the May 2016 discharge report lists a total chemical flux of 0.2798 pounds /day from all the A-Zone and B-Zone wells along Royal Avenue and 47th Street. The following table provides the average daily flow and total daily chemical loading (VOCs) to the tunnel sewer system from the A-Zone and B-Zone wells going back to 2014.

Reporting Period	Calculated Daily Flow (gal/day)	Total Chemical Loading (VOCs) from A-Zone and B-Zone wells (pounds/day)
November 2016	1,809	0.0741
May 2016	3,457	0.2798
November 2015	2,097	0.1273
May 2015	2,395	0.1396
November 2014	3,220	0.0902
May 2014	3,077	0.1463

4.3 Vertical Gradients

Groundwater elevations were collected from wells in the C-Zone (MW1-C-08, MW2-C-08, and MW3-C-08) during the October 2016 semiannual and annual groundwater sampling activities. The groundwater elevations were compared to the groundwater contours in the B-Zone at the same locations of the C-Zone wells that were generated using groundwater elevations from B-Zone wells during the October 2016 sampling activities. The following table shows the groundwater elevations (measured in feet above mean sea level) in the B-Zone and C-Zone at the locations of MW1-C-08, MW2-C-08, and MW3-C-08 in October 2016.

Zone	MW-1	MW-2	MW-3
B	546	555	555
C	556.99	557.18	557.71

The upward gradient between the C-Zone and B-Zone was confirmed by the groundwater elevations collected from the C-Zone wells and the B-Zone groundwater contours in October 2016.

5. Overall Conclusions and Recommendations

All of the required work was completed and is reported herein. The remedy has effectively isolated and secured the residual material, and there is no risk to human health or the environment. It is noted that there are a few chemicals present in the C-Zone groundwater that exceed the NYS TOGS standards. However, there is an upward gradient from the C-Zone into the B-Zone that should protect the C-Zone from impact associated with any of the residual materials left in the Site soils. It is recommended that the annual groundwater monitoring of the C-Zone wells continue as described in the SMP in order to track the current condition. Semiannual groundwater monitoring and annual inspections will also continue as described in the SMP.

As required, a completed copy of the Site Management Periodic Review Report Notice – Institutional and Engineering Controls Certificate Form is included as Attachment D.

Should there be any questions, please do not hesitate to contact me at 716-205-1975 or Michelle Hamm and Bill Rajczak of Cascades at 716-490-0595.

Sincerely,

GHD

Shaun McEvoy

SM/adh/1

Encl.

cc: Michelle Hamm, Cascades
Bill Rajczak, Cascades
Robert Adams, GHD

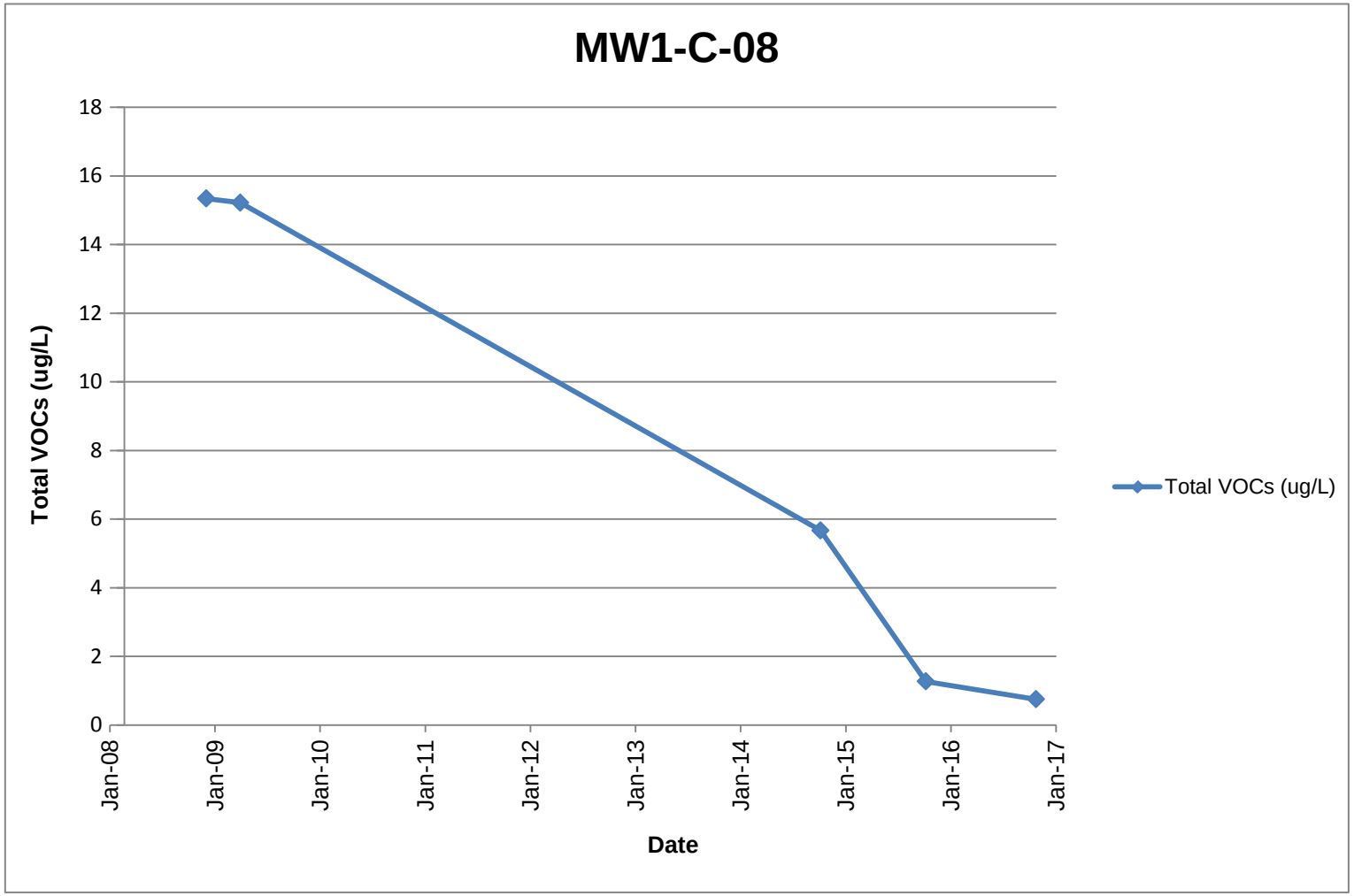


figure 1
Total VOC Concentration Trend, MW1-C-08 (2008 - 2016)
Cascades Containerboard Packaging Site
2016 Periodic Review Report
GHD

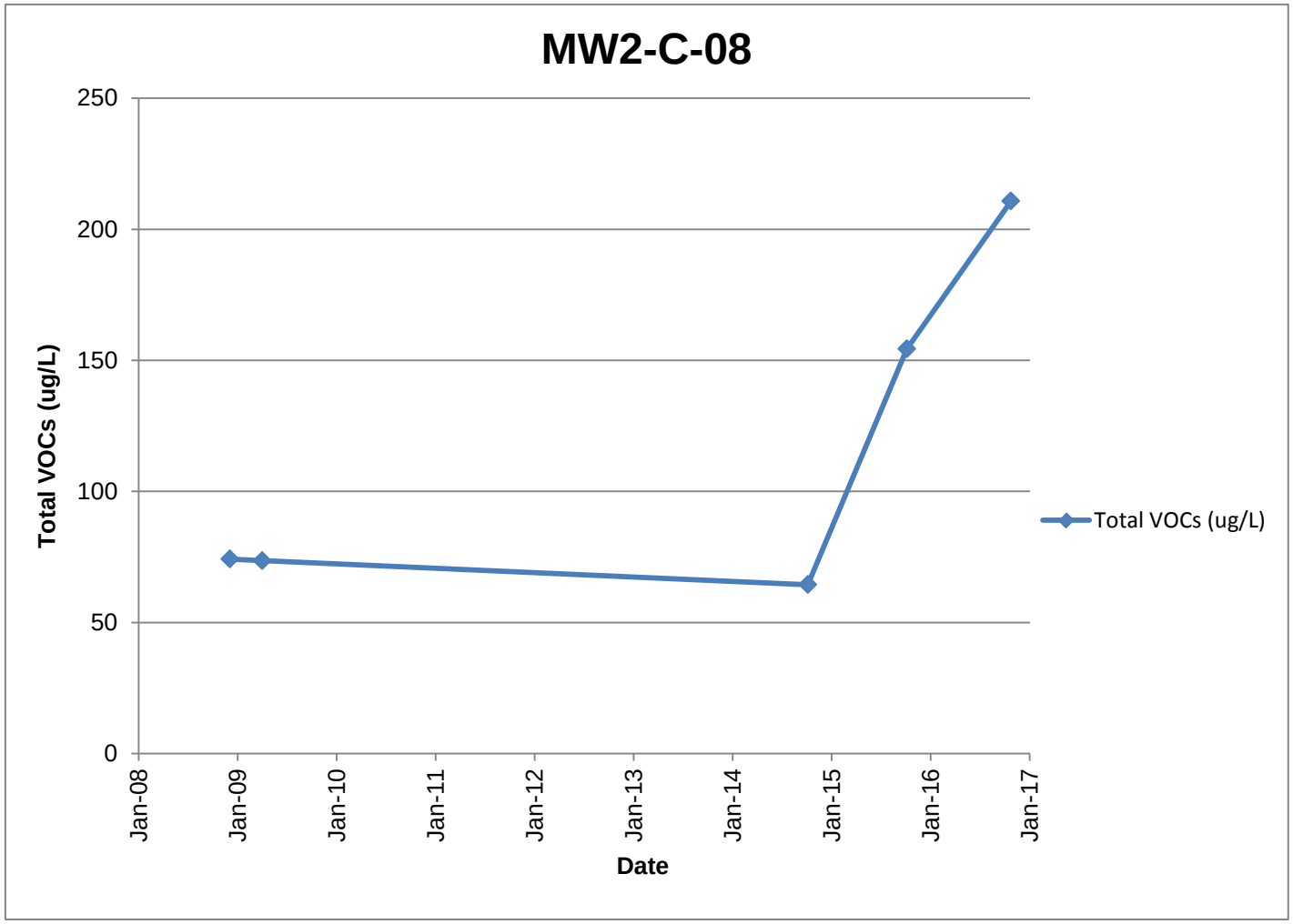


figure 2
Total VOC Concentration Trend, MW2-C-08 (2008 - 2016)
Cascades Containerboard Packaging Site
2016 Periodic Review Report
GHD

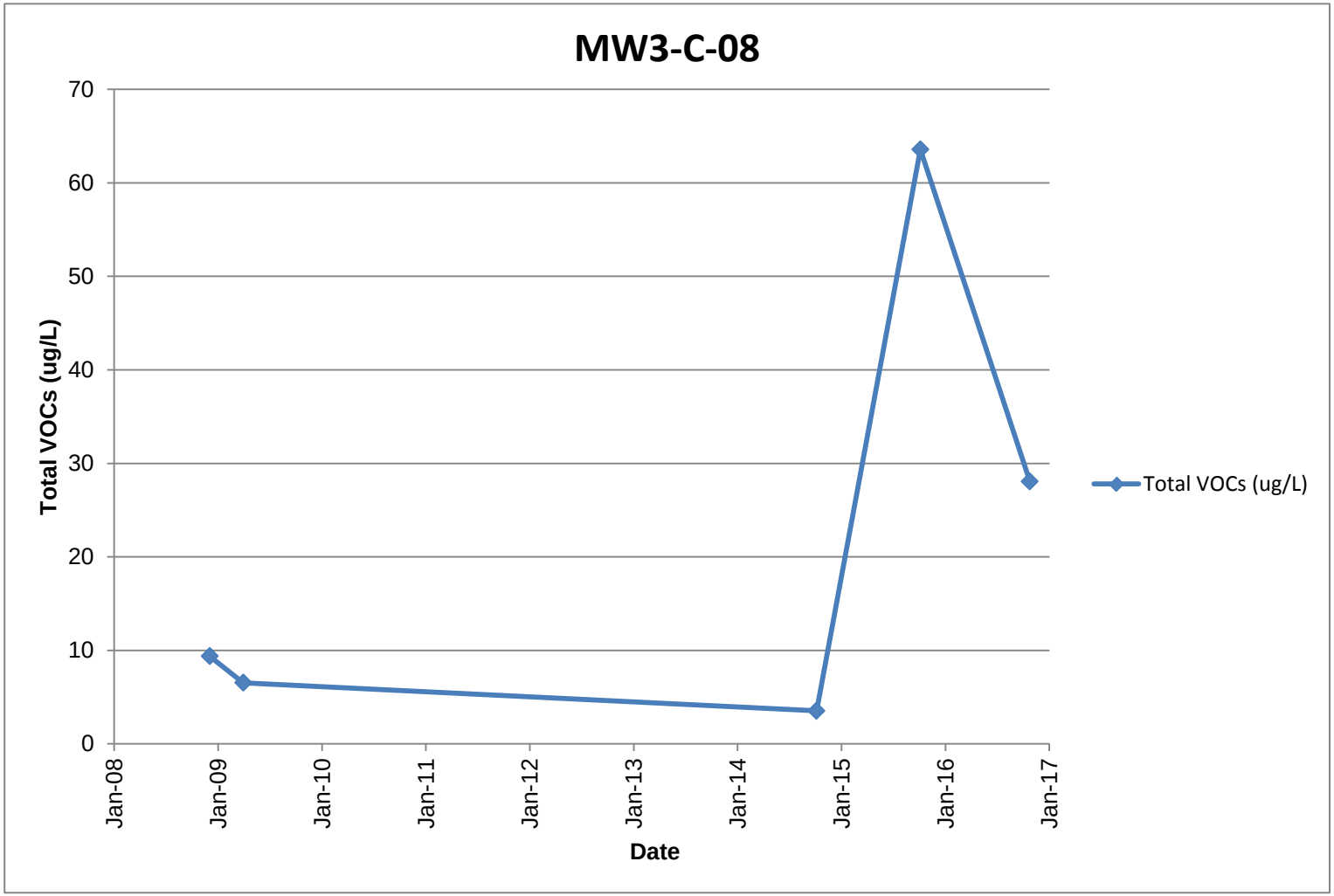


figure 3
Total VOC Concentration Trend, MW3-C-08 (2008 - 2016)
Cascades Containerboard Packaging Site
2016 Periodic Review Report
GHD

Table 1

Analytical Results Summary
C-Zone Groundwater Sampling
Cascades Containerboard Packaging Site
Niagara Falls, New York
October 2016

	Location ID:	MW1-C-08	MW2-C-08	MW3-C-08
	Sample Name:	WG-11109628-102516-SG-003	WG-11109628-102516-SG-006	WG-11109628-102616-SG-008
	Sample Date:	10/25/2016	10/25/2016	10/26/2016
Parameters	**Unit**			
Volatile Organic Compounds				
1,1,1-Trichloroethane	µg/L	5.0 U	20 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	5.0 U	20 U	5.0 U
1,1,2-Trichloroethane	µg/L	5.0 U	20 U	5.0 U
1,1-Dichloroethane	µg/L	0.75 J	20 U	5.0 U
1,1-Dichloroethene	µg/L	5.0 U	20 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	5.0 U	20 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	5.0 U	20 U	5.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	5.0 U	20 U	5.0 U
1,2-Dichlorobenzene	µg/L	5.0 U	6.8 J	3.5 J
1,2-Dichloroethane	µg/L	5.0 U	20 U	5.0 U
1,2-Dichloropropane	µg/L	5.0 U	20 U	5.0 U
1,3-Dichlorobenzene	µg/L	5.0 U	20	3.2 J
1,4-Dichlorobenzene	µg/L	5.0 U	37	13
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	25 U	100 U	25 U
2-Hexanone	µg/L	25 U	100 U	25 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	25 U	100 U	25 U
Acetone	µg/L	25 U	100 U	25 U
Benzene	µg/L	5.0 U	13 J	5.0 U
Bromodichloromethane	µg/L	5.0 U	20 U	5.0 U
Bromoform	µg/L	5.0 U	20 U	5.0 U
Bromomethane (Methyl bromide)	µg/L	5.0 U	20 U	5.0 U
Carbon disulfide	µg/L	5.0 U	20 U	5.0 U
Carbon tetrachloride	µg/L	5.0 U	20 U	5.0 U
Chlorobenzene	µg/L	5.0 U	120	5.6
Chloroethane	µg/L	5.0 U	20 U	5.0 U
Chloroform (Trichloromethane)	µg/L	5.0 U	20 U	5.0 U
Chloromethane (Methyl chloride)	µg/L	5.0 U	20 U	5.0 U
cis-1,2-Dichloroethene	µg/L	5.0 U	20 U	5.0 U
cis-1,3-Dichloropropene	µg/L	5.0 U	20 U	5.0 U
Dibromochloromethane	µg/L	5.0 U	20 U	5.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	5.0 U	20 U	5.0 U
Ethylbenzene	µg/L	5.0 U	20 U	5.0 U
Isopropyl benzene	µg/L	5.0 U	20 U	5.0 U
Methyl tert butyl ether (MTBE)	µg/L	5.0 U	20 U	5.0 U
Methylene chloride	µg/L	5.0 U	20 U	5.0 U
Styrene	µg/L	5.0 U	20 U	5.0 U
Tetrachloroethene	µg/L	5.0 U	20 U	5.0 U
Toluene	µg/L	5.0 U	20 U	5.0 U
trans-1,2-Dichloroethene	µg/L	5.0 U	20 U	5.0 U
trans-1,3-Dichloropropene	µg/L	5.0 U	20 U	5.0 U
Trichloroethene	µg/L	5.0 U	20 U	5.0 U
Trichlorofluoromethane (CFC-11)	µg/L	5.0 U	20 U	5.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	5.0 U	20 U	5.0 U
Vinyl chloride	µg/L	5.0 U	20 U	5.0 U
Xylenes (total)	µg/L	10 U	40 U	10 U

Notes:

U - Not present at or above the associated Method Detection Limit (MDL)
J - Estimated concentration between the MDL and Reporting Limit

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

Parameter	Units	New York State TOGs Guidance Value	New York State TOGs Standard	Location ID: MW1-C-08 Sample Name: GW-47392-120308-JJW-001 Sample Date: 12/03/2008	MW1-C-08 GW-47392-033109-JJW-014 03/31/2009	MW1-C-08 GW-47392-033109-JJW-015 03/31/2009 Duplicate	MW1-C-08 WG-47392-100714-DJT-010 10/07/2014
Volatile Organic Compounds (VOCs)							
1,1,1-Trichloroethane	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	NC	1	1.0 U	1.0 U	1.0 U	5.0 U
1,1-Dichloroethane	µg/L	NC	5	1.0 U	1.0 U	1.0 U	0.77J
1,1-Dichloroethene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	1.0 U	1.0 U	1.0 U	--
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	1.0 U	1.0 U	1.0 U	--
1,2-Dichlorobenzene	µg/L	NC	3	1.0 U	1.0 U	1.0 U	5.0 U
1,2-Dichloroethane	µg/L	NC	0.6	1.0 U	1.0 U	1.0 U	5.0 U
1,2-Dichloropropane	µg/L	NC	1	1.0 U	1.0 U	1.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	NC	3	1.0 U	1.0 U	1.0 U	5.0 U
1,4-Dichlorobenzene	µg/L	NC	3	1.0 U	1.0 U	1.0 U	5.0 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	5.0 U	5.0 U	5.0 U	--
2-Chlorotoluene	ug/L	NC	5	1.0 U	1.0 U	1.0 U	--
2-Chloroethyl vinyl ether	µg/L	NC	NC	--	--	--	25 U
2-Hexanone	µg/L	50	NC	5.0 U	5.0 U	5.0 U	--
3-Chlorotoluene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	--
4-Chlorotoluene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	5.0 U	5.0 U	5.0 U	--
Acetone	µg/L	50	NC	5.0 U	5.0 U	5.0 U	25 U
Acrolein	µg/L	NC	5	--	--	--	100 U
Acrylonitrile	µg/L	NC	5	--	--	--	50 U
Benzene	µg/L	NC	1	0.84 J	**3.1**	**2.6**	**1.6 J**
Bromodichloromethane	µg/L	50	NC	1.0 U	1.0 U	1.0 U	5.0 U
Bromoform	µg/L	50	NC	1.0 U	1.0 U	1.0 U	5.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Carbon disulfide	µg/L	60	NC	1.0 U	1.0 U	1.0 U	--
Carbon tetrachloride	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Chlorobenzene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Chloroethane	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	**10**	1.0 U	0.65 J	5.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	1.0 U	1.0 UJ	1.0 UJ	5.0 U
cis-1,2-Dichloroethene	µg/L	NC	5	1.0 U	1.6	1.2	0.84 J
cis-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	1.0 U	1.0 U	5.0 U
Cyclohexane	µg/L	NC	NC	1.1	1.0 U	1.0 U	--
Dibromochloromethane	µg/L	50	NC	1.0 U	1.0 U	1.0 U	5.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	1.0 U	1.0 U	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	1.0 U	--	--	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

Parameter	Units	New York State TOGs Guidance Value	New York State TOGs Standard	Location ID: MW1-C-08 Sample Name: GW-47392-120308-JJW-001 Sample Date: 12/03/2008	MW1-C-08 GW-47392-033109-JJW-014 03/31/2009	MW1-C-08 GW-47392-033109-JJW-015 03/31/2009 Duplicate	MW1-C-08 WG-47392-100714-DJT-010 10/07/2014
Volatile Organic Compounds (VOCs)							
Ethylbenzene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Isopropylbenzene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	--
Methyl acetate	µg/L	NC	NC	1.0 U	1.0 U	1.0 U	--
Methyl cyclohexane	µg/L	NC	NC	1.8	1.0 U	1.0 U	--
Methyl Tert Butyl Ether	µg/L	10	NC	1.0 U	1.0 U	1.0 U	--
Methylene chloride	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Styrene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	--
Tetrachloroethene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Toluene	µg/L	NC	5	1.6	4.7 J	**9.8 J**	5.0 U
Total Monochlorotoluenes	µg/L	NC	NC	1 U	1 U	1 U	5.0 U
trans-1,2-Dichloroethene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	0.96 J
trans-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	1.0 U	1.0 U	5.0 U
Trichloroethene	µg/L	NC	5	1.0 U	1.0 U	1.0 U	5.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	1.0 U	1.0 U	1.0 U	--
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	1.0 U	1.0 U	1.0 U	--
Vinyl chloride	µg/L	NC	2	1.0 U	1.5	0.97 J	1.5 J
Xylene (total)	µg/L	NC	NC	3.0 U	2.0 U	2.0 U	--
Total VOCs	µg/L	NC	NC	15.34	10.9	15.22	5.67

Notes:

6.24	- Concentration exceed NYS TOGs
U	- Not present at or above the associated MDL
J	- Estimated concentration between the MDL and Reporting Limit
MDL	- Method Detection Limit
NC	- No criteria
NYS TOGs	- New York State Technical and Operational Guidance Series
--	- Not analyzed

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

			Location ID:	**MW1-C-08**	**MW1-C-08**	**MW2-C-08**
			Sample Name:	**WG-11109628-100815-SG-012**	**WG-11109628-102516-SG-003**	**GW-47392-120508-JJW-011**
			Sample Date:	**10/08/2015**	**10/25/2016**	**12/05/2008**
		New York State TOGs				
Parameter	**Units**	**Guidance Value**	**Standard**			
Volatile Organic Compounds (VOCs)						
1,1,1-Trichloroethane	µg/L	NC	5	5.0 U	5.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	5.0 U	5.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	NC	1	5.0 U	5.0 U	1.0 U
1,1-Dichloroethane	µg/L	NC	5	0.65 J	0.75 J	1.0 U
1,1-Dichloroethene	µg/L	NC	5	5.0 U	5.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	5.0 U	5.0 U	1.0 UJ
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	--	5.0 U	1.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	--	5.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	NC	3	5.0 U	5.0 U	1.5
1,2-Dichloroethane	µg/L	NC	0.6	5.0 U	5.0 U	1.0 U
1,2-Dichloropropane	µg/L	NC	1	5.0 U	5.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	NC	3	5.0 U	5.0 U	2.3
1,4-Dichlorobenzene	µg/L	NC	3	5.0 U	5.0 U	**3.6**
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	--	25 U	5.0 U
2-Chlorotoluene	ug/L	NC	5	--		2.0
2-Chloroethyl vinyl ether	µg/L	NC	NC	25 U	--	--
2-Hexanone	µg/L	50	NC	--	25 U	5.0 U
3-Chlorotoluene	µg/L	NC	5	--		1.0 U
4-Chlorotoluene	µg/L	NC	5	--		1.0 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	--	25 U	5.0 U
Acetone	µg/L	50	NC	25 U	25 U	5.0 UJ
Acrolein	µg/L	NC	5	100 U	--	--
Acrylonitrile	µg/L	NC	5	50 U	--	--
Benzene	µg/L	NC	1	0.62 J	5.0 U	**33**
Bromodichloromethane	µg/L	50	NC	5.0 U	5.0 U	1.0 U
Bromoform	µg/L	50	NC	5.0 U	5.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	5.0 U	5.0 U	1.0 U
Carbon disulfide	µg/L	60	NC	--	5.0 U	0.57 J
Carbon tetrachloride	µg/L	NC	5	5.0 U	5.0 U	1.0 U
Chlorobenzene	µg/L	NC	5	5.0 U	5.0 U	**24**
Chloroethane	µg/L	NC	5	5.0 U	5.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	5.0 U	5.0 U	1.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	5.0 U	5.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	NC	5	5.0 U	5.0 U	2.8
cis-1,3-Dichloropropene	µg/L	NC	NC	5.0 U	5.0 U	1.0 U
Cyclohexane	µg/L	NC	NC	--	--	1.0 U
Dibromochloromethane	µg/L	50	NC	5.0 U	5.0 U	1.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	--	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	--	5.0 U	1.0 U

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

			Location ID:	**MW1-C-08**	**MW1-C-08**	**MW2-C-08**
			Sample Name:	**WG-11109628-100815-SG-012**	**WG-11109628-102516-SG-003**	**GW-47392-120508-JJW-011**
			Sample Date:	**10/08/2015**	**10/25/2016**	**12/05/2008**
		New York State TOGs				
Parameter	**Units**	**Guidance Value**	**Standard**			
Volatile Organic Compounds (VOCs)						
Ethylbenzene	µg/L	NC	5	5.0 U	5.0 U	1.0 U
Isopropylbenzene	µg/L	NC	5	--	5.0 U	1.0 U
Methyl acetate	µg/L	NC	NC	--	--	1.0 UJ
Methyl cyclohexane	µg/L	NC	NC	--	--	1.0 U
Methyl Tert Butyl Ether	µg/L	10	NC	--	5.0 U	1.0 U
Methylene chloride	µg/L	NC	5	5.0 U	5.0 U	1.0 U
Styrene	µg/L	NC	5	--	5.0 U	1.0 U
Tetrachloroethene	µg/L	NC	5	5.0 U	5.0 U	1.0 U
Toluene	µg/L	NC	5	5.0 U	5.0 U	1.0
Total Monochlorotoluenes	µg/L	NC	NC	5.0 U	25 U	2
trans-1,2-Dichloroethene	µg/L	NC	5	5.0 U	5.0 U	0.80 J
trans-1,3-Dichloropropene	µg/L	NC	NC	5.0 U	5.0 U	1.0 U
Trichloroethene	µg/L	NC	5	5.0 U	5.0 U	0.63 J
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	--	5.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5	--	5.0 U	1.0 U
Vinyl chloride	µg/L	NC	2	5.0 U	5.0 U	2.0
Xylene (total)	µg/L	NC	NC	--	10 U	3.0 U
Total VOCs	µg/L	NC	NC	1.27	0.75	74.2

Notes:

6.24	- Concentration exceed NYS TOGs
U	- Not present at or above the associated MDL
J	- Estimated concentration between the MDL and Reporting Limit
MDL	- Method Detection Limit
NC	- No criteria
NYS TOGs	- New York State Technical and Operational Guidance Series
--	- Not analyzed

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW2-C-08	MW2-C-08
				Sample Name:	GW-47392-040309-JJW-023	WG-47392-100714-SG-011	WG-11109628-100715-SG-008
				Sample Date:	04/03/2009	10/7/2014	10/07/2015
		New York State TOGs					
Parameter	**Units**	**Guidance Value**	**Standard**				
Volatile Organic Compounds (VOCs)							
1,1,1-Trichloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	NC	1	1.0 U	5.0 U	5.0 U
1,1-Dichloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,1-Dichloroethene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	1.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	1.0 U	--	--
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	1.0 U	--	--
1,2-Dichlorobenzene	µg/L	NC	3	1.5	2.8 J	**6.2**
1,2-Dichloroethane	µg/L	NC	0.6	1.0 U	5.0 U	5.0 U
1,2-Dichloropropane	µg/L	NC	1	1.0 U	5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	NC	3	**3.1**	**3.4 J**	**13**
1,4-Dichlorobenzene	µg/L	NC	3	**4.0**	**7.8**	**25**
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	5.0 U	--	--
2-Chlorotoluene	ug/L	NC	5	1.0 U	--	--
2-Chloroethyl vinyl ether	µg/L	NC	NC	--	25 U	25 U
2-Hexanone	µg/L	50	NC	5.0 U	--	--
3-Chlorotoluene	µg/L	NC	5	2.3	--	--
4-Chlorotoluene	µg/L	NC	5	1.0 U	--	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	5.0 U	--	--
Acetone	µg/L	50	NC	5.0 U	25 U	25 U
Acrolein	µg/L	NC	5	--	100 U	100 U
Acrylonitrile	µg/L	NC	5	--	50 U	50 U
Benzene	µg/L	NC	1	**30**	**8.6**	**12**
Bromodichloromethane	µg/L	50	NC	1.0 U	5.0 U	--
Bromoform	µg/L	50	NC	1.0 U	5.0 U	5.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Carbon disulfide	µg/L	60	NC	1.0 U	--	--
Carbon tetrachloride	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Chlorobenzene	µg/L	NC	5	**26**	**38**	**86**
Chloroethane	µg/L	NC	5	1.0 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	1.0 U	5.0 U	5.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	1.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	NC	5	2.6	5.0 U	0.67 J
cis-1,3-Dichloropropene	µg/L	NC	NC	1.0 U	5.0 U	5.0 U
Cyclohexane	µg/L	NC	NC	1.0 U	--	--
Dibromochloromethane	µg/L	50	NC	1.0 U	5.0 U	5.0 U
Dibromodifluoromethane	µg/L	NC	NC	1.0 U	--	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	--	--	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW2-C-08	MW2-C-08
				Sample Name:	GW-47392-040309-JJW-023	WG-47392-100714-SG-011	WG-11109628-100715-SG-008
				Sample Date:	04/03/2009	10/7/2014	10/07/2015
		New York State TOGs					
Parameter	**Units**	**Guidance Value**	**Standard**				
Volatile Organic Compounds (VOCs)							
Ethylbenzene	µg/L	NC	5		1.0 U	5.0 U	5.0 U
Isopropylbenzene	µg/L	NC	5		1.0 U	--	--
Methyl acetate	µg/L	NC	NC		1.0 UJ	--	--
Methyl cyclohexane	µg/L	NC	NC		1.0 U	--	--
Methyl Tert Butyl Ether	µg/L	10	NC		1.0 U	--	--
Methylene chloride	µg/L	NC	5		1.0 U	5.0 U	5.0 U
Styrene	µg/L	NC	5		1.0 U	--	--
Tetrachloroethene	µg/L	NC	5		1.0 U	5.0 U	5.0 U
Toluene	µg/L	NC	5		1.0 U	5.0 U	0.56 J
Total Monochlorotoluenes	µg/L	NC	NC		2.3	3.0 J	9.84 J
trans-1,2-Dichloroethene	µg/L	NC	5		0.61 J	5.0 U	5.0 U
trans-1,3-Dichloropropene	µg/L	NC	NC		1.0 U	5.0 U	5.0 U
Trichloroethene	µg/L	NC	5		0.52 J	5.0 U	5.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5		1.0 U	--	--
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5		1.0 U	--	--
Vinyl chloride	µg/L	NC	2		**3.0**	0.85 J	1.1 J
Xylene (total)	µg/L	NC	NC		2.0 U	--	--
Total VOCs	µg/L	NC	NC		73.63	64.45	154.37

Notes:

6.24	- Concentration exceed NYS TOGs
U	- Not present at or above the associated MDL
J	- Estimated concentration between the MDL and Reporting Limit
MDL	- Method Detection Limit
NC	- No criteria
NYS TOGs	- New York State Technical and Operational Guidance Series
--	- Not analyzed

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW3-C-08	MW3-C-08
				Sample Name:	WG-11109628-102516-SG-006	GW-47392-120408-JJW-006	GW-47392-040109-JJW-019
				Sample Date:	10/25/2016	12/04/2008	04/01/2009
		New York State TOGs					
Parameter	**Units**	**Guidance Value**	**Standard**				
Volatile Organic Compounds (VOCs)							
1,1,1-Trichloroethane	µg/L	NC	5	20 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	20 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	NC	1	20 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	NC	5	20 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	NC	5	20 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	20 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	20 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	20 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	NC	3	**6.8 J**	0.54 J	0.58 J
1,2-Dichloroethane	µg/L	NC	0.6	20 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	NC	1	20 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	NC	3	**20**	0.50 J	0.47 J
1,4-Dichlorobenzene	µg/L	NC	3	**37**	1.0	1.2
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	100 U	5.0 U	5.0 U
2-Chlorotoluene	ug/L	NC	5		0.67 J	1.0 U
2-Chloroethyl vinyl ether	µg/L	NC	NC	--	--	--
2-Hexanone	µg/L	50	NC	100 U	5.0 U	5.0 U
3-Chlorotoluene	µg/L	NC	5		1.0 U	0.56 J
4-Chlorotoluene	µg/L	NC	5		1.0 U	1.0 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	100 U	5.0 U	5.0 U
Acetone	µg/L	50	NC	100 U	5.0 U	5.0 U
Acrolein	µg/L	NC	5	--	--	--
Acrylonitrile	µg/L	NC	5	--	--	--
Benzene	µg/L	NC	1	**13 J**	0.83 J	1.0 U
Bromodichloromethane	µg/L	50	NC	20 U	1.0 U	1.0 U
Bromoform	µg/L	50	NC	20 U	1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	20 U	1.0 U	1.0 U
Carbon disulfide	µg/L	60	NC	20 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	NC	5	20 U	1.0 U	1.0 U
Chlorobenzene	µg/L	NC	5	**120**	1.3	1.1
Chloroethane	µg/L	NC	5	20 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	20 U	0.60 J	1.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	20 U	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	µg/L	NC	5	20 U	1.8	1.9
cis-1,3-Dichloropropene	µg/L	NC	NC	20 U	1.0 U	1.0 U
Cyclohexane	µg/L	NC	NC	--	1.0 U	1.0 U
Dibromochloromethane	µg/L	50	NC	20 U	1.0 U	1.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	--	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	20 U	1.0 U	--

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

				Location ID:	MW2-C-08	MW3-C-08	MW3-C-08
				Sample Name:	WG-11109628-102516-SG-006	GW-47392-120408-JJW-006	GW-47392-040109-JJW-019
				Sample Date:	10/25/2016	12/04/2008	04/01/2009
		New York State TOGs					
Parameter	**Units**	**Guidance Value**	**Standard**				
Volatile Organic Compounds (VOCs)							
Ethylbenzene	µg/L	NC	5		20 U	1.0 U	1.0 U
Isopropylbenzene	µg/L	NC	5		20 U	1.0 U	1.0 U
Methyl acetate	µg/L	NC	NC		--	1.0 U	1.0 U
Methyl cyclohexane	µg/L	NC	NC		--	1.0 U	1.0 U
Methyl Tert Butyl Ether	µg/L	10	NC		20 U	1.0 U	1.0 U
Methylene chloride	µg/L	NC	5		20 U	1.0 U	1.0 U
Styrene	µg/L	NC	5		20 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	NC	5		20 U	1.0 U	1.0 U
Toluene	µg/L	NC	5		20 U	1.0 U	1.0 U
Total Monochlorotoluenes	µg/L	NC	NC		14 J	0.67 J	0.56 J
trans-1,2-Dichloroethene	µg/L	NC	5		20 U	0.54 J	0.73 J
trans-1,3-Dichloropropene	µg/L	NC	NC		20 U	1.0 U	1.0 U
Trichloroethene	µg/L	NC	5		20 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5		20 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5		20 U	1.0 U	1.0 U
Vinyl chloride	µg/L	NC	2		20 U	1.5	1.0 U
Xylene (total)	µg/L	NC	NC		40 U	3.0 U	2.0 U
Total VOCs	µg/L	NC	NC		210.8	9.28	6.54

Notes:

6.24	- Concentration exceed NYS TOGs
U	- Not present at or above the associated MDL
J	- Estimated concentration between the MDL and Reporting Limit
MDL	- Method Detection Limit
NC	- No criteria
NYS TOGs	- New York State Technical and Operational Guidance Series
--	- Not analyzed

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

				Location ID:	MW3-C-08	MW3-C-08	MW3-C-08
				Sample Name:	WG-47392-100714-SG-012	WG-11109628-100715-DT-007	WG-11109628-102616-SG-008
				Sample Date:	10/7/2014	10/07/2015	10/26/2016
		New York State TOGs					
Parameter	**Units**	**Guidance Value**	**Standard**				
Volatile Organic Compounds (VOCs)							
1,1,1-Trichloroethane	µg/L	NC	5	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	NC	5	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	NC	1	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	µg/L	NC	5	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	µg/L	NC	5	5.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	µg/L	NC	5	5.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	--	--	5.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	NC	0.0006	--	--	5.0 U
1,2-Dichlorobenzene	µg/L	NC	3	5.0 U	0.98 J	**3.5 J**
1,2-Dichloroethane	µg/L	NC	0.6	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	µg/L	NC	1	5.0 U	5.0 U	5.0 U
1,3-Dichlorobenzene	µg/L	NC	3	5.0 U	1.7 J	**3.2 J**
1,4-Dichlorobenzene	µg/L	NC	3	1.0 J	**3.3 J**	**13**
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	NC	--	--	25 U
2-Chlorotoluene	ug/L	NC	5	--	--	
2-Chloroethyl vinyl ether	µg/L	NC	NC	25 U	25 U	--
2-Hexanone	µg/L	50	NC	--	--	25 U
3-Chlorotoluene	µg/L	NC	5	--	--	25 U
4-Chlorotoluene	µg/L	NC	5	--	--	25 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	NC	--	--	25 U
Acetone	µg/L	50	NC	25 U	25 U	25 U
Acrolein	µg/L	NC	5	100 U	100 U	--
Acrylonitrile	µg/L	NC	5	50 U	50 U	--
Benzene	µg/L	NC	1	5.0 U	5.0 U	5.0 U
Bromodichloromethane	µg/L	50	NC	5.0 U	5.0 U	5.0 U
Bromoform	µg/L	50	NC	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl Bromide)	µg/L	NC	5	5.0 U	5.0 U	5.0 U
Carbon disulfide	µg/L	60	NC	--	--	5.0 U
Carbon tetrachloride	µg/L	NC	5	5.0 U	5.0 U	5.0 U
Chlorobenzene	µg/L	NC	5	5.0 U	1.1 J	**5.6**
Chloroethane	µg/L	NC	5	5.0 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	µg/L	NC	7	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl Chloride)	µg/L	NC	5	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	µg/L	NC	5	1.6 J	**45**	5.0 U
cis-1,3-Dichloropropene	µg/L	NC	NC	5.0 U	5.0 U	5.0 U
Cyclohexane	µg/L	NC	NC	--	--	--
Dibromochloromethane	µg/L	50	NC	5.0 U	5.0 U	5.0 U
Dibromodifluoromethane	µg/L	NC	NC	--	--	--
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	--	--	5.0 U

Table 2

Summary of Deep Groundwater (C-Zone) Analytical Results
Cascades Containerboard Packaging Site
Niagara Falls, New York

				Location ID:	MW3-C-08	MW3-C-08	MW3-C-08
				Sample Name:	WG-47392-100714-SG-012	WG-11109628-100715-DT-007	WG-11109628-102616-SG-008
				Sample Date:	10/7/2014	10/07/2015	10/26/2016
		New York State TOGs					
Parameter	**Units**	**Guidance Value**	**Standard**				
Volatile Organic Compounds (VOCs)							
Ethylbenzene	µg/L	NC	5		5.0 U	5.0 U	5.0 U
Isopropylbenzene	µg/L	NC	5		--	--	5.0 U
Methyl acetate	µg/L	NC	NC		--	--	--
Methyl cyclohexane	µg/L	NC	NC		--	--	--
Methyl Tert Butyl Ether	µg/L	10	NC		--	--	5.0 U
Methylene chloride	µg/L	NC	5		5.0 U	5.0 U	5.0 U
Styrene	µg/L	NC	5		--	--	5.0 U
Tetrachloroethene	µg/L	NC	5		5.0 U	5.0 U	5.0 U
Toluene	µg/L	NC	5		5.0 U	5.0 U	5.0 U
Total Monochlorotoluenes	µg/L	NC	NC		5.0 U	5.0 U	2.75 J
trans-1,2-Dichloroethene	µg/L	NC	5		5.0 U	0.70 J	5.0 U
trans-1,3-Dichloropropene	µg/L	NC	NC		5.0 U	5.0 U	5.0 U
Trichloroethene	µg/L	NC	5		5.0 U	1.8 J	5.0 U
Trichlorofluoromethane (CFC-11)	µg/L	NC	5		--	--	5.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	NC	5		--	--	5.0 U
Vinyl chloride	µg/L	NC	2		0.93 J	**9**	5.0 U
Xylene (total)	µg/L	NC	NC		--	--	10 U
Total VOCs	µg/L	NC	NC		3.53	63.58	28.05

Notes:

6.24	- Concentration exceed NYS TOGs
U	- Not present at or above the associated MDL
J	- Estimated concentration between the MDL and Reporting Limit
MDL	- Method Detection Limit
NC	- No criteria
NYS TOGs	- New York State Technical and Operational Guidance Series
--	- Not analyzed

Attachment A
2016 Site Inspection Form

SITE INSPECTION FORM
CASCADES CONTAINERBOARD PACKAGING SITE
NIAGARA FALLS, NEW YORK
NYSDEC SITE NO. 932110

INSPECTION DATE: 10/24/16

INSPECTED BY: D. Tyran / S. Gardner

Overall Site

Has the Site use changed since the last inspection? *Yes* _____ *No* ✓

If yes, please describe the changes: _____

Have neighboring property uses changed? *Yes* _____ *No* ✓

If yes, please describe the changes: _____

Asphalt/Concrete Cover System

Potential Problems	***Concern***	***Corrective Action***
Potholes and cracks	• Deterioration of asphalt pavement or concrete • Safety hazard	• Use cold mix or hot mix asphalt and liquid bituminous material to patch, repair, or replace asphalt • For concrete, select repair method based on type and extent of damage
Ponding water	• Safety hazard	• No action required if ponding is minor • If ponding is significant, install drainage holes in asphalt/concrete pavement
Obstructions/Debris	• Safety hazard	• Remove obstructions as soon as possible

Inspect For	***Inspection Item Identified (circle one)***		***Action Required (circle one)***		***Comments***
Deterioration	Yes	(No)	Yes	(No)	
Obstruction/Debris	Yes	(No)	Yes	(No)	
Potholes	Yes	(No)	Yes	(No)	
Drainage/Puddles	(Yes)	No	Yes	(No)	
Other	Yes	(No)	Yes	(No)	

SITE INSPECTION FORM
CASCADES CONTAINERBOARD PACKAGING SITE
NIAGARA FALLS, NEW YORK
NYSDEC SITE NO. 932110

INSPECTION DATE: 10/24/16

INSPECTED BY: D. Tyran / S. Gardner

Soil Cover System

Potential Problems	***Concern***	***Corrective Action***
Erosion	• Deterioration of integrity of crushed concrete cover • Washed out cover	• Backfill with additional imported crushed stone as needed • If persistent erosion occurs, erosion control mats may be required in selected areas
Animal burrows	• Potential for crushed concrete erosion • Safety hazard	• Contract exterminator regarding trapping and relocation of persistent rodents • Fill all holes with crushed stone
Damage to fence	• Potential access to Site by unauthorized persons	• No action if damage is minor and does not allow access by unauthorized persons • Repair fence if appropriate

Inspect For	***Inspection Item Identified (circle one)***		***Action Required (circle one)***		***Comments***
Erosion	(Yes)	No	Yes	(No)	Some large/deep ruts from truck traffic
Animal Burrows	Yes	(No)	Yes	(No)	
Damage to fence	Yes	(No)	Yes	(No)	
Other	Yes	(No)	Yes	(No)	

All fence problems noted in 2015 inspection have been corrected

D. Tyran

SITE INSPECTION FORM
CASCADES CONTAINERBOARD PACKAGING SITE
NIAGARA FALLS, NEW YORK
NYSDEC SITE NO. 932110

INSPECTION DATE: 10/24/16

INSPECTED BY: D. Tyrell / S. Gardner

Monitoring Wells

Potential Problems	***Concern***	***Corrective Action***
Missing locks	• Potential access by unauthorized persons	• Replace lock
Missing J-plugs	• Potential well contamination from surface water or rain water	• Replace J-plug
Concrete surface seal	• Damaged seal can allow water infiltration around casing and contamination of groundwater	• Contract drilling subcontractor to have surface seal replaced
Damaged flush-mount or stickup casing	• Damaged casing can result in damage to riser	• Contract drilling subcontractor to have casing replaced

Monitoring Well	***Well Condition (circle one)***			***Comments***
MW3C-08	(Good)	Fair	Needs Repair	
BH87-3A	(Good)	Fair	Needs Repair	
BH87-3B	(Good)	Fair	Needs Repair	
MW01-9A	(Good)	Fair	Needs Repair	
MW-9	Good	(Fair)	Needs Repair	
MW2C-08	(Good)	Fair	Needs Repair	
MW88-13A	Good	Fair	(Needs Repair)	casing broken off at ground surface
BH87-28	Good	(Fair)	Needs Repair	
MW-12	(Good)	Fair	Needs Repair	
MW1C-08	(Good)	Fair	Needs Repair	
MW-13	(Good)	Fair	Needs Repair	

Attachment B
May 2016 and November 2016 Semiannual Discharge Reports

May 19, 2016 Reference No. 11109628

Mr. Joel Paradise
Niagara Falls Water Board
5815 Buffalo Avenue
Niagara Falls, NY 14304

Dear Mr. Paradise:

Re: Semiannual Groundwater Discharge Report
SIU Permit #72
Norampac Facility (Former Frontier Chemical Site)

This semiannual report has been prepared in accordance with Paragraph G of the Significant Industrial User Permit #78 issued on October 1, 2015 by the Niagara Falls Water Board to Norampac Industries, Inc. (formerly Frontier Chemical Site PRP Group) in Niagara Falls, New York (Site). The report presents the analytical data and field measurements taken for the semiannual period covering December 2015 through May 2016. The data collected have been used to calculate the volume of groundwater and the chemical loading associated with the groundwater that discharges into the Falls Street Tunnel (FST) and the 47th Street Tunnel which are located immediately adjacent to the Frontier Chemical Site.

1. Data Collection

Groundwater levels were measured in all of the available monitoring wells in the A Zone and B Zone of the bedrock formation at the Site. The groundwater levels were measured on April 6, 2016, and the data are presented on attached Figures 1 and 2.

Groundwater samples were collected from the following monitoring wells on April 6, 2016 and analyzed for the list of parameters specified in Paragraphs F and G of the Permit.

A Zone

- MW01-9A
- MW88-13A
- BH87-28
- BH-87-3A

GHD Services Inc.
2055 Niagara Falls Boulevard Niagara Falls New York 14304 USA
T 716 297 6150 **F** 716 297 2265 **W** www.ghd.com

B Zone

- BH87-3B
- MW-9
- MW-12
- MW-13

2. Flow Calculation

The groundwater flow volume is calculated based upon the thickness of the bedrock aquifer through which the groundwater flows, the aquifer permeability, and the gradient (slope) of the groundwater table. These three factors are combined, using Darcy's Law of hydraulic flow, to determine the flow volume (Flow = permeability x gradient x cross sectional saturated area). The groundwater gradients used in the flow calculation are presented on Figures 1 and 2. The calculation of groundwater flow is presented in Table 1. The Bedrock A Zone migration boundary along the south side of the Site has been divided into the west side and the east side. The April 2016 groundwater levels show that a portion of the A Zone groundwater discharge from the western half of the Site continues to discharge towards Royal Avenue. The most likely receiver of the A Zone groundwater in this area is the underlying B Zone, which is captured by the 47th Street Tunnel.

The calculated volume of groundwater discharge to the tunnels from the entire Site for the December 2015 through May 2016 time period is 3,457 gallons per day.

It is noted that the groundwater in the B Zone continues to flow to the east toward 47th Street with no migration to the south. This flow pattern is consistent with the pattern that developed after the closure of a portion of the FST and was first measured during the October 19, 2012 groundwater monitoring event.

3. Loading Calculation

The chemical loading to the tunnel sewer system is determined by multiplying groundwater flow volume by the concentration of the chemicals in the groundwater at the downgradient boundary of the Site, adjacent to where the groundwater enters the tunnels. Since there are multiple wells available along the tunnels, the chemical concentrations of this group of wells have been averaged to provide the best estimate of chemical loading. The concentrations of chemicals present in the April 2016 groundwater samples and the calculated chemical loadings to the tunnel sewers for each individual compound for each flow zone are presented in Tables 2a, 2b, 2c, 3a, and 3b. The total daily chemical loading for each compound is summarized in Table 4.

4. Discharge Limitations

The calculated volume of groundwater discharge to the tunnels and the associated chemical loadings have been compared to the limitations of the Permit (see Table 5). The calculations show that all parameters are within the Permit limits.

It is noted that, while it is expected that the chemical loadings will decrease over time, some variability should be expected in the groundwater hydraulics and concentrations used to calculate the infiltration conditions and, therefore, some flexibility is needed in the Permit limits for the Site. It is believed that the Permit limits are reasonable, given the current conditions and making allowance for some continued variation over time. However, if conditions change, modifications may be necessary.

5. Next Report

The next semiannual report will be submitted to the Niagara Falls Water Board by November 30, 2016.

Should you have any questions, please contact me.

Sincerely,

GHD

Shaun McEvoy

SM/adh/2

Encl. SIU Permit Calculations and Permit Submittal Sheets

cc: Rick Roll
Paul Drof
Bill Rajczak

REPUTED OWNER
NIAGARA JUNCTION RAILWAY COMPANY

MW88-1A
NM

MW90-1A
559.29

MW-14
559.35

MW88-4A
558.96

MW-17
(DESTROYED 2015)

MW88-14A

MW88-8A
556.91

MW88-10A
559.44

REPUTED OWNER
5335 RIVER ROAD, INC.
L-3118, P-293

MW88-12A
556.17

MW88-7A

MW88-2A

MW88-3A

BH87-2A
558.29

MW-15
562.75

BH87-5C
NM

MW-2
NM

MW88-9A
558.37

MW01-9A
555.92

MW88-6A

MW88-13A
556.72

BH87-3A
556.01

BH87-28
551.28

559 558 557 556 560 561 562 555 554 553 552

h_1 h_2 h_3 h_4

$i_1 = \frac{h_1 - h_2}{L_1}$

$i_2 = \frac{h_3 - h_4}{L_2}$

REPUTED OWNER
FRANK'S VACUUM TRUCK SERVICE
L-2362, P-255

47th STREET

47TH STREET
TUNNEL

ROYAL AVENUE

REPUTED OWNER
ELKEM METALS COMPANY

0 50 100ft

LEGEND

MW88-12A	A-ZONE MONITORING WELL LOCATION
MW88-2A	WELL DECOMMISSIONED DURING 2013 SOIL REMEDIATION
556.91	GROUNDWATER ELEVATION (ft. AMSL)
NM	NOT MEASURED
554	GROUNDWATER CONTOUR (ft. AMSL)
	GROUNDWATER FLOW DIRECTION

figure 1

GROUNDWATER CONTOURS - ZONE A
APRIL 2016
Norampac-Frontier Site - Niagara Falls, New York

REPUTED OWNER
NIAGARA JUNCTION RAILWAY COMPANY

REPUTED OWNER
5335 RIVER ROAD, INC.
L-3118, P-293

REPUTED OWNER
FRANK'S VACUUM TRUCK SERVICE
L-2362, P-255

REPUTED OWNER
ELKEM METALS COMPANY

MW88-4B
554.09

MW88-1B
NM

MW90-1B
550.16

MW-13
545.71

MW88-14B

MW88-8B
546.68

MW88-10B
559.23

h_5

h_6

$i_3 = \frac{h_5 - h_6}{L_3}$

MW88-12B
547.96

BH87-2B
551.95

MW88-2B

MW88-7BR

BH87-5A
565.28 *

MW88-3B

MW88-5B

MW88-9B
548.28

47TH STREET
TUNNEL

MW88-6B

MW-9
556.15

MW-11

BH87-3B
555.95

MW-12
547.25

ROYAL AVENUE

47th STREET

0 50 100ft

LEGEND

MW88-12B	B-ZONE MONITORING WELL LOCATION
MW88-2B	WELL DECOMMISIONED DURING 2013 SOIL REMEDIATION
546.68	GROUNDWATER ELEVATION (ft. AMSL)
NM	NOT MEASURED
550	GROUNDWATER CONTOUR (ft. AMSL)
	GROUNDWATER FLOW DIRECTION
*	ANOMOLOUS VALUE, NOT USED IN CONTOURING

figure 2

GROUNDWATER CONTOURS - ZONE B
APRIL 2016
Norampac-Frontier Site - Niagara Falls, New York

Table 1

April 2016 Groundwater Flow Rate Estimate
Norampac Facility
Niagara Falls, New York

A) Bedrock A-Zone (Figure 1)

Royal Avenue West Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h1-h2
= 6.83 ft

Distance between h1 & h2 = 226 ft

i = 6.83/226 = 0.030

Flow Width: 420 ft
K = 2.5×10^{-5} to 5.2×10^{-5} ft/sec
Flow rate: = 5ft x 0.030 x 420 ft x 5.2×10^{-5} ft/sec
= 3.27×10^{-3} ft^3/sec
= 2117 USgal/day
= 772,705 USgal/year

Royal Avenue East Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h3-h4
= 7.72 ft

Distance between h3 & h4 = 821 ft

i = 7.72/821 = 0.0094

Flow Width: 340 ft
K = 2.5×10^{-5} to 5.2×10^{-5} ft/sec
Flow rate: = 5ft x 0.0094 x 340 ft x 5.2×10^{-5} ft/sec
= 8.31×10^{-4} ft^3/sec
= 537 USgal/day
= 196,0156 USgal/year

47th Street South Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h3-h4
=7.72ft

Distance between h_3 & h_4 = 821 ft

i = 7.72/821 = 0.0094

Flow Width: 330 ft
K = 2.5×10^{-5} to 5.2×10^{-5} ft/sec
Flow rate: = 5ft x 0.0094x 330 ft x 5.2×10^{-5} ft/sec
= 8.06×10^{-4} ft^3/sec
= 521 USgal/day
= 190,249 USgal/year

Notes:

See Figure 1 for locations of h_1, h_2, h_3 and h_4

Table 1

April 2016 Groundwater Flow Rate Estimate
Norampac Facility
Niagara Falls, New York

B) Bedrock B-Zone (Figure 2)

Flow Thickness: 2-foot-thick fracture zone from 8 to 10 feet beneath A-Zone
Flow from B-Zone now discharges to the east

• Easterly Flow:

Head Difference: = h_5-h_6 = 12 feet
Distance between h_5 & h_6 = 500 ft
Gradient: = 0.024
Flow Width: = 650 ft
Hydraulic Conductivity: = 1.4 x 10^{-5} ft/sec
Flow rate: = 2ft x 0.024 x 650 ft x 1.4 x 10^{-5} ft/sec
= 4.37 x 10^{-4} ft^3/sec
= 282 USgal/day
= 103,036 USgal/year

Notes:

See Figure 2 for locations of h_5 and h_6

Table 2A

A-Fracture Zone Bedrock, Royal Avenue West Side Discharge
April 2016 Chemical Flux
Norampac Facility
Niagara Falls, New York

Analyte	Adjacent Wells MW-01-9A 04/06/2016	Adjacent Wells BH87-3A 04/06/2016	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**1400/1400**	250 U	712.5	0.0126
1,2,4-Trichlorobenzene	**85 J/86**	250 U	55.3	0.0010
1,2-Dichlorobenzene	**1400/1400**	**500**	950.0	0.0168
1,3-Dichlorobenzene	**1800/1700**	**1400**	1575.0	0.0278
1,4-Dichlorobenzene	**1800/1700**	**1300**	1525.0	0.0269
Acetone	**710 J/650 J**	1300 U	405.0	0.0072
Benzene	**500/490**	250 U	260.0	0.0046
Chlorobenzene	**2100/2000**	**540**	1295.0	0.0229
cis-1,2-Dichloroethene	**1600/1600**	**41 J**	820.5	0.0145
Tetrachloroethene	**510/460 J**	250 U	255.0	0.0045
Toluene	**610/590 J**	250 U	312.5	0.0055
Trichloroethene	**760/710 J**	**35 J**	385.0	0.0068
Vinyl chloride	**260 J/250 J**	250 U	140.0	0.0025
Monochlorotoluene	**6700/6300**	**170 J**	3335.0	0.0589
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**1410/1410**	**19.2**	714.6	0.0126
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**99.2/101**	15 U	50.8	0.0009
Iron	**877/917**	138 U	455.4	0.0080
Potassium	**1290000/1320000**	**166000**	735500.0	12.9893
Sodium	**433000/457000**	**74100**	259550.0	4.5838

Notes:

(1) For U values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) Flow rate = 2117 US gallons/day
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 2B

A-Fracture Zone Bedrock, Royal Avenue East Side Discharge
April 2016 Chemical Flux
Norampac Facility
Niagara Falls, New York

Analyte	Adjacent Wells BH87-28 04/06/2016	MW-88-6A	MW-88-13A 04/06/2016	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	**25**	**NS**	**920 J**	472.5	0.0021
1,2,4-Trichlorobenzene	**1.4 J**	**NS**	**320**	160.7	0.0007
1,2-Dichlorobenzene	**200**	**NS**	**4300**	2250.0	0.0101
1,3-Dichlorobenzene	**160**	**NS**	**1300 J**	730.0	0.0033
1,4-Dichlorobenzene	**130**	**NS**	**2400**	1265.0	0.0057
Acetone	**4.8 J**	**NS**	**310 J**	157.4	0.0007
Benzene	**430**	**NS**	**1500 J**	965.0	0.0043
Chlorobenzene	**190**	**NS**	**1900**	1045.0	0.0047
cis-1,2-Dichloroethene	**520**	**NS**	**820**	670.0	0.0030
Tetrachloroethene	**0.59 J**	**NS**	**1800**	900.3	0.0040
Toluene	**35**	**NS**	**490**	262.5	0.0012
Trichloroethene	**2.9 J**	**NS**	**3200**	1601.5	0.0072
Vinyl chloride	**190**	**NS**	**49 J**	119.5	0.0005
Monochlorotoluene	**115**	**NS**	**4700**	2407.5	0.0108
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**82.9**	**NS**	**363**	223.0	0.0010
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**26.6**	**NS**	**199**	112.8	0.0005
Iron	182 U	**NS**	**3130**	1574.1	0.0071
Potassium	**4930000**	**NS**	**1850000**	3390000.0	15.1864
Sodium	**375000**	**NS**	**299000**	337000.0	1.5097

Notes:

(1) For U values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) Flow rate = 537 US gallons/day
NS - Not samplable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 2C

A-Fracture Zone Bedrock, 47th Street Discharge
April 2016 Chemical Flux
Norampac Facility
Niagara Falls, New York

Analyte	Adjacent Wells		Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
	BH87-28 04/06/2016	BH87-5C		
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**25**	NS	25.0	0.00011
1,2,4-Trichlorobenzene	**1.4 J**	NS	1.4	0.00001
1,2-Dichlorobenzene	**200**	NS	200.0	0.00087
1,3-Dichlorobenzene	**160**	NS	160.0	0.00070
1,4-Dichlorobenzene	**130**	NS	130.0	0.00057
Acetone	**4.8 J**	NS	4.8	0.00002
Benzene	**430**	NS	430.0	0.00187
Chlorobenzene	**190**	NS	190.0	0.00083
cis-1,2-Dichloroethene	**520**	NS	520.0	0.00226
Tetrachloroethene	**0.59 J**	NS	0.6	0.00000
Toluene	**35**	NS	35.0	0.00015
Trichloroethene	**2.9 J**	NS	2.9	0.00001
Vinyl chloride	**190**	NS	190.0	0.00083
Monochlorotoluene	**115**	NS	115.0	0.00050
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**82.9**	NS	82.9	0.00036
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**26.6**	NS	26.6	0.00012
Iron	182 U	NS	0.0	0.00000
Potassium	**4930000**	NS	4930000.0	21.42719
Sodium	**375000**	NS	375000.0	1.62986

Notes:

(1) For U values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) Flow rate = 521 US gallons/day
NS - Well not sampleable
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 3A

B-Fracture Zone Bedrock - Southerly Discharge
April 2016 Chemical Flux
Norampac Facility
Niagara Falls, New York

Analyte	Adjacent Wells					Average Concentration (µg/L) Southerly Discharge	Mass Flux (pounds/day) Adjacent Wells
	MW-9 04/06/2016	MW-11	MW-12 04/06/2016	BH87-3B 04/06/2016	MW-88-6B		
VOCs by Method OLM04.2 (µg/L)							
1,1-Dichloroethane	**160**	**NS**	**9.7 J**	**2.6 J**	**NS**	57.4	0.0000
1,2,4-Trichlorobenzene	**1.5 J**	**NS**	40 U	5 U	**NS**	2.0	0.0000
1,2-Dichlorobenzene	**35**	**NS**	40 U	**100**	**NS**	46.3	0.0000
1,3-Dichlorobenzene	**68**	**NS**	40 U	**140**	**NS**	70.7	0.0000
1,4-Dichlorobenzene	**61**	**NS**	40 U	**170**	**NS**	78.3	0.0000
Acetone	**30 J**	**NS**	200 U	25 U	**NS**	17.5	0.0000
Benzene	**29**	**NS**	40 U	**8.9**	**NS**	14.0	0.0000
Chlorobenzene	**86**	**NS**	40 U	**250**	**NS**	113.3	0.0000
cis-1,2-Dichloroethene	**72**	**NS**	**14 J**	**41**	**NS**	42.3	0.0000
Tetrachloroethene	**1.5 J**	**NS**	40 U	**10**	**NS**	5.2	0.0000
Toluene	**17**	**NS**	40 U	**0.85 J**	**NS**	7.3	0.0000
Trichloroethene	**5.2 J**	**NS**	40 U	**40**	**NS**	16.4	0.0000
Vinyl chloride	**70**	**NS**	40 U	**4.9 J**	**NS**	26.3	0.0000
Monochlorotoluene	**153**	**NS**	40 U	**28.48**	**NS**	61.8	0.0000
SVOCs by Method OLM04.2 (µg/L)							
Phenol	**111**	**NS**	**13**	**13.6**	**NS**	45.9	0.0000
TAL Metals by Method ILM04.0 (µg/L)							
Arsenic	**47.9**	**NS**	**25.7**	15 U	**NS**	25.0	0.0000
Iron	**656**	**NS**	**286**	144 U	**NS**	318.8	0.0000
Potassium	**2320000**	**NS**	**5960000**	**160000**	**NS**	2813333.3	0.0000
Sodium	**396000**	**NS**	**490000**	**86300**	**NS**	324100.0	0.0000

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) For U values where compound was not detected in any listed well, the average concentration was set to 0 µg/L
(3) Flow rate = 0 US gallons/day
NS - Not sampleable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 3B

B-Fracture Zone Bedrock - Easterly Discharge
April 2016 Chemical Flux
Norampac Facility
Niagara Falls, New York

Analyte	Adjacent Wells			Average Concentration (µg/L)	Mass Flux (pounds/day)
	MW-12 04/06/2016	MW-13 04/06/2016	BH87-5A	Easterly Discharge	Adjacent Wells
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	**9.7 J**	50 U	NS	7.4	1.72909E-05
1,2,4-Trichlorobenzene	40 U	50 U	NS	0.0	0
1,2-Dichlorobenzene	40 U	50 U	NS	0.0	0
1,3-Dichlorobenzene	40 U	**7.7 J**	NS	5.9	1.37621E-05
1,4-Dichlorobenzene	40 U	**12 J**	NS	8.0	1.882E-05
Acetone	200 U	250 U	NS	0.0	0
Benzene	40 U	50 U	NS	0.0	0
Chlorobenzene	40 U	**14 J**	NS	9.0	2.11725E-05
cis-1,2-Dichloroethene	**14 J**	**59**	NS	36.5	8.58663E-05
Tetrachloroethene	40 U	50 U	NS	0.0	0
Toluene	40 U	50 U	NS	0.0	0
Trichloroethene	40 U	**8.9 J**	NS	6.5	1.51736E-05
Vinyl chloride	40 U	50 U	NS	0.0	0
Monochlorotoluene	40 U	**370**	NS	187.0	0.000439918
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**13**	**11.6**	NS	12.3	2.89358E-05
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**25.7**	15 U	NS	13.6	3.1994E-05
Iron	**286**	**702**	NS	494.0	0.001162135
Potassium	**5960000**	**50600**	NS	3005300.0	7.069969452
Sodium	**490000**	**134000**	NS	312000.0	0.733980125

Notes:

(1) For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentraion
(2) For U values where compound was not detected in any listed well, the average concentration was set to 0 µg/L
(3) Flow rate = 282 US gallons/day
NS - Not samplable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration

Table 4

Total Chemical Flux
April 2016
Norampac Facility
Niagara Falls, New York

Analyte	Zone A Royal Ave West Side Mass Flux Adjacent Wells (pounds/day)	Zone A Royal Avenue East Side Mass Flux Adjacent Wells (pounds/day)	Zone A 47th Street Mass Flux Adjacent Wells (pounds/day)	Zone B Easterly Flow Mass Flux Adjacent Wells (pounds/day)	Total (pounds/day)
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	0.0126	0.0021	0.0001	< 0.0001	0.0148
1,2,4-Trichlorobenzene	0.0010	0.0007	0.0000	0.0000	0.0017
1,2-Dichlorobenzene	0.0168	0.0101	0.0009	0.0000	0.0277
1,3-Dichlorobenzene	0.0278	0.0033	0.0007	< 0.0001	0.0318
1,4-Dichlorobenzene	0.0269	0.0057	0.0006	< 0.0001	0.0332
Acetone	0.0072	0.0007	0.0000	0.0000	0.0079
Benzene	0.0046	0.0043	0.0019	0.0000	0.0108
Chlorobenzene	0.0229	0.0047	0.0008	< 0.0001	0.0284
cis-1,2-Dichloroethene	0.0145	0.0030	0.0023	< 0.0001	0.0198
Tetrachloroethene	0.0045	0.0040	0.0000	< 0.0000	0.0085
Toluene	0.0055	0.0012	0.0002	0.0000	0.0068
Trichloroethene	0.0068	0.0072	0.0000	< 0.0001	0.0140
Vinyl chloride	0.0025	0.0005	0.0008	0.0000	0.0038
Monochlorotoluene	0.0589	0.0108	0.0005	0.0004	0.0706
TOTAL VOCs	0.2124	0.0583	0.0087	0.0004	0.2798
SVOCs by Method OLM04.2 (µg/L)					
Phenol	0.0126	0.0010	0.0004	< 0.0001	0.0140
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	0.0009	0.0005	0.0001	< 0.0001	0.0015
Iron	0.0080	0.0071	0.0000	0.00116	0.0163
Potassium	12.9893	15.1864	21.4272	7.06997	56.6728
Sodium	4.5838	1.5097	1.6299	0.73398	8.4573

Notes:

VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List

Table 5

Comparisons of Loading to Interim Discharge Limitations
April 2016
Norampac Facility
Niagara Falls, New York

Outfall Number / Effluent Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements		Calculated Daily Discharge April 2016 pounds/day except as noted (gallons/day)
	Annual Average	Daily Maximum		Measurement Frequency	Sample Type	
MS #1 Flow		3600	gallons/day	2 per year	See E-2	3457
MS #1 Arsenic		0.008	pounds/day	2 per year	See E-3	0.0015
MS#1 Iron		0.24	pounds/day	2 per year	See E-3	0.0163
MS #1 Potassium		400	pounds/day	2 per year	See E-3	56.6728
MS #1 Sodium		40	pounds/day	2 per year	See E-3	8.4573
MS #1 T. Phenol		0.05	pounds/day	2 per year	See E-3	0.014
MS #1 1,1-Dichloroethane		0.13	pounds/day	2 per year	See E-3	0.0148
MS#1 1,2,4-Trichlorobenzene		0.026	pounds/day	2 per year	See E-3	0.0017
MS #1 1,2-Dichlorobenzene		0.26	pounds/day	2 per year	See E-3	0.0277
MS #1 1,3-Dichlorobenzene		0.11	pounds/day	2 per year	See E-3	0.0318
MS#1 1,4-Dichlorobenzene		0.17	pounds/day	2 per year	See E-3	0.0332
MS #1 Acetone		0.026	pounds/day	2 per year	See E-3	0.0079
MS #1 Benzene		0.15	pounds/day	2 per year	See E-3	0.0108
MS #1 Chlorobenzene		0.1	pounds/day	2 per year	See E-3	0.0284
MS #1 Cis-1,2-Dichloroethene		0.06	pounds/day	2 per year	See E-3	0.0198
MS #1 Tetrachloroethene		0.05	pounds/day	2 per year	See E-3	0.0085
MS#1 Toluene		0.03	pounds/day	2 per year	See E-3	0.0068
MS #1 Trichloroethene		0.15	pounds/day	2 per year	See E-3	0.014
MS #1 Vinyl Chloride		0.012	pounds/day	2 per year	See E-3	0.0038
MS #1 Monochlorotoluene		0.2	pounds/day	2 per year	See E-3	0.0706

Attachment A
SIU Permit Calculations and Permit Sheets

NIAGARA FALLS WATER BOARD
WASTEWATER FACILITIES
ENFORCEMENT DIVISION

SELF-MONITORING REPORT
SIGNIFICANT INDUSTRIAL USERS

PERMIT NO. 078 SEMIANNUAL DECEMBER 2015 – MAY 2016

INDUSTRY NAME: Norampac Industries, Inc.

Pursuant to federal pretreatment reporting requirements and the Niagara Falls Water Board Regulations Part 1960, Significant Industrial Users shall submit periodic self-monitoring and compliance reports. Such reports shall be submitted using this form, according to the following schedule:

Quarterly	-	1st Quarter by February 28th
	-	2nd Quarter by May 31st
	-	3rd Quarter by August 31st
	-	4th Quarter by November 30th
Semi-Annual	-	by May 31st
		and
	-	by November 30th

Each section of this report form shall be filled out for those parameters listed in Section "G" of the company's Wastewater Discharge Permit. The analysis results must be reported in both concentration and mass. In addition, the calculated annual average load (pounds/day) for each pollutant shall also be reported.

The samples shall be collected at the monitoring points identified in the user permit. Identification of those points in this report should be as listed on page two (2) of the User Permit.

SELF-MONITORING REPORT
Significant Industrial Users (SIUs)

PAGE 2

PART II of the report is the Compliance Monitoring section. The user is obligated to determine if the analysis results indicates compliance. All violations noted should be brought to the Niagara Falls Water Board – Wastewater Facilities attention immediately upon noting and should also be reported in this section. The analysis result should be compared against all applicable federal, state and local standards and limitations. If no violations are noted then **"NO VIOLATIONS"** should appear on the report.

Pursuant to 40 CFR Part 403.12g of the Federal Standards, all violations noted must be followed up by a sample recollect/analysis and the results submitted to the Niagara Falls Water Board within thirty (30) days of first becoming aware of the violation.

Pursuant to 40 CFR Part 403.12g all Periodic Self-Monitoring Reports must be signed by a "responsible company official" certifying the following statement:

> I, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____

Title: Consultant for Norampac Industries, Inc.

Date: May 19, 2016

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac Industries, Inc.**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone Royal Avenue- West Side**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: April 6, 2016						
24-HOUR FLOW IN MGD	0.00212				0.00140	
BENZENE	260		0.0046		149	0.0024
MONOCHLOROBENZENE	1,295		0.0229		1,040	0.0137
1,2 – DICHLOROBENZENE	950		0.0168		1,058	0.0118
1,3 – DICHLOROBENZENE	1,575		0.0278		1,685	0.0191
1,4 – DICHLOROBENZENE	1,525		0.0269		1,715	0.0189
1,2,4 - TRICHLOROBENZENE	55		0.0010		34	0.0006
1,1 - DICHLOROETHANE	713		0.0126		385	0.0065
CIS – 1,2 - DICHLOROETHYLENE	821		0.0145		433	0.0074
ACETONE	405		0.0072		209	0.0037
TETRACHLOROETHYLENE	255		0.0045		130	0.0023
TOLUENE	313		0.0055		164	0.0028
TRICHLOROETHYLENE	385		0.0068		201	0.0035
VINYL CHLORIDE	140		0.0025		85	0.0014
MONOCHLOROTOLUENES	3,335		0.0589		1,975	0.0312
TOTAL PHENOL	715		0.0126		381	0.0065
ARSENIC	51		0.0009		34	0.0005
IRON	518		0.0080		576	0.0058
POTASSIUM	735,500		12.9893		792,625	8.9368
SODIUM	259,550		4.5838		214,200	2.7772

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac Industries, Inc.**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone - Royal Avenue East Side**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: April 6, 2016						
24-HOUR FLOW IN MGD	0.00054				0.00056	
BENZENE	965		0.0043		990	0.0047
MONOCHLOROBENZENE	1,045		0.0047		1,118	0.0076
1,2 - DICHLOROBENZENE	2,250		0.0101		2,480	0.0117
1,3 - DICHLOROBENZENE	730		0.0033		805	0.0038
1,4 - DICHLOROBENZENE	1,265		0.0057		1,515	0.0072
1,2,4 - TRICHLOROBENZENE	161		0.0007		191	0.0009
1,1 - DICHLOROETHANE	473		0.0021		543	0.0026
CIS – 1,2 - DICHLOROETHYLENE	670		0.0030		660	0.0031
ACETONE	158		0.0007		244	0.0012
TETRACHLOROETHYLENE	900		0.0040		1,078	0.0051
TOLUENE	263		0.0012		278	0.0013
TRICHLOROETHYLENE	1,602		0.0072		1,804	0.0085
VINYL CHLORIDE	120		0.0005		129	0.0006
MONOCHLOROTOLUENES	2,408		0.0108		2,645	0.0125
TOTAL PHENOL	223		0.00141		266	0.0012
ARSENIC	113		0.0005		113	0.0006
IRON	1,656		0.0071		1,428	0.0065
POTASSIUM	3,390,000		15.1864		3,370,000	15.8097
SODIUM	337,000		1.5097		342,000	1.6059

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac Industries, Inc.**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A-Zone 47th Street**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: April 6, 2016						
24-HOUR FLOW IN MGD	0.00052				0.00053	
BENZENE	430		0.0019		430	0.0019
MONOCHLOROBENZENE	190		0.0008		185	0.0009
1,2 - DICHLOROBENZENE	200		0.0009		210	0.0010
1,3 - DICHLOROBENZENE	160		0.0007		160	0.0007
1,4 - DICHLOROBENZENE	130		0.0006		130	0.0006
1,2,4 - TRICHLOROBENZENE	1.4		0.0000		0.7	0.0000
1,1-DICHLOROETHANE	25		0.0001		25	0.0001
CIS – 1,2 - DICHLOROETHYLENE	520		0.0023		430	0.0019
ACETONE	4.8		0.0000		2.4	0.0000
TETRACHLOROETHYLENE	0.6		0.0000		0.3	0.0000
TOLUENE	35		0.0002		35	0.0002
TRICHLOROETHYLENE	2.9		0.0000		1.5	0.0000
VINYL CHLORIDE	190		0.0007		205	0.0009
MONOCHLOROTOLUENES	115		0.0005		123	0.0006
TOTAL PHENOL	82.9		0.0004		78	0.0004
ARSENIC	26.6		0.0001		27	0.0001
IRON	0		0.0000		74	0.0004
POTASSIUM	4,930,000		21.43		4,875,000	21.53
SODIUM	375,000		1.63		372,500	1.65

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac Industries, Inc.**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (South)**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: April 6, 2016						
24-HOUR FLOW IN MGD	0.000000[(1)]				0.000000	
BENZENE	14		0.0000		11	0.0000
MONOCHLOROBENZENE	113		0.0000		98	0.0000
1,2 – DICHLOROBENZENE	46		0.0000		37	0.0000
1,3 - DICHLOROBENZENE	71		0.0000		63	0.0000
1,4 - DICHLOROBENZENE	78		0.0000		69	0.0000
1,2,4 - TRICHLOROBENZENE	2		0.0000		1	0.0000
1,1 - DICHLOROETHANE	57		0.0000		44	0.0000
CIS – 1,2 - DICHLOROETHYLENE	42		0.0000		30	0.0000
ACETONE	17		0.0000		8.5	0.0000
TETRACHLOROETHYLENE	5.2		0.0000		7.5	0.0000
TOLUENE	7.3		0.0000		3.7	0.0000
TRICHLOROETHYLENE	16		0.0000		19	0.0000
VINYL CHLORIDE	26		0.0000		17	0.0000
MONOCHLOROTOLUENES	62		0.0000		71	0.0000
TOTAL PHENOL	46		0.0000		28	0.0000
						0.0000
ARSENIC	25		0.0000		24	0.0000
IRON	319		0.0000		276	0.0000
POTASSIUM	2813333		0.0000		2,710,050	0.0000
SODIUM	324,100		0.0000		303,500	0.0000

[(1)] No discharge to south for the time period December 2015 through May 2016.

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac Industries, Inc.**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (East)**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: April 6, 2016						
24-HOUR FLOW IN MGD	0.00028				0.00028	
BENZENE	0.0		0.0		2.8	<0.0001
MONOCHLOROBENZENE	9		<0.0001		13	<0.0001
1,2 - DICHLOROBENZENE	0.0		0.0		5.5	<0.0001
1,3 - DICHLOROBENZENE	5.9		<0.0001		12	<0.0001
1,4 - DICHLOROBENZENE	8.0		<0.0001		14	<0.0001
1,2,4 - TRICHLOROBENZENE	0.0		0.0		0.0	0.0
1,1 - DICHLOROETHANE	7.4		<0.0001		11	<0.0001
CIS – 1,2 - DICHLOROETHYLENE	36.5		<0.0001		21	<0.0001
ACETONE	0.0		0.0		0.0	0.0
TETRACHLOROETHYLENE	0.0		0.0		2.7	<0.0001
TOLUENE	0.0		0.0		0.0	0.0
TRICHLOROETHYLENE	6.5		<0.0001		6.3	<0.0001
VINYL CHLORIDE	0.0		0.0		0.0	0.0
MONOCHLOROTOLUENES	187		0.0004		214	0.0005
TOTAL PHENOL	12.3		<0.0001		6.2	<0.0001
ARSENIC	14		<0.0001		16	<0.0001
IRON	494		0.0012		805	0.0019
POTASSIUM	3,005,300		7.070		2,922,400	6.875
SODIUM	312,000		0.7340		305,250	0.718

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Norampac Industries, Inc.**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Total Sum of Bedrock A and B Zones**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: April 6, 2016						
24-HOUR FLOW IN MGD	0.003457				0.002777	
BENZENE			0.0108			0.0090
MONOCHLOROBENZENE			0.0284			0.0198
1,2 - DICHLOROBENZENE			0.0277			0.0244
1,3 - DICHLOROBENZENE			0.0318			0.0236
1,4 - DICHLOROBENZENE			0.0332			0.0267
1,2,4 - TRICHLOROBENZENE			0.0017			0.0015
1,1 - DICHLOROETHANE			0.0148			0.0091
CIS – 1,2 - DICHLOROETHYLENE			0.0198			0.0138
ACETONE			0.0079			0.0048
TETRACHLOROETHYLENE			0.0085			0.0074
TOLUENE			0.0068			0.0043
TRICHLOROETHYLENE			0.0140			0.0120
VINYL CHLORIDE			0.0038			0.0029
MONOCHLOROTOLUENES			0.0706			0.0447
TOTAL PHENOL			0.0140			0.0081
ARSENIC			0.0015			0.0012
IRON			0.0163			0.0146
POTASSIUM			56.6728			53.151
SODIUM			8.4573			6.431

PART II

COMPLIANCE MONITORING

SIU NAME: Norampac Industries, Inc.

PERMIT NO.: 078

NO VIOLATIONS

VIOLATION PARAMETER	DATE	FLOW [MGD]	SAMPLE POINT LOCATION	ACTUAL* DISCHARGE	PERMIT LIMIT	TYPE** LIMIT VIOLATED

NOTE:

* - Actual discharge – list actual analytical results and appropriate units.

** - Type Limit Violated – List Type:

A.A. = Annual Average

D.M. = Daily Maximum

L.L. = Local Limits (Regulation 1960.5)

ADMIN\WINWORD\PARADISE\SIU\SELF-MONITORING REPORT FORM - BLANK

November 23, 2016 Reference No. 11109628

Mr. Joel Paradise
Niagara Falls Water Board
5815 Buffalo Avenue
Niagara Falls, NY 14304

Dear Mr. Paradise:

Re: Semiannual Groundwater Discharge Report
SIU Permit #78
Cascades Containerboard Packaging, Inc. (Former Frontier Chemical Site)

This semiannual report has been prepared in accordance with Paragraph G of the Significant Industrial User Permit #78 issued on October 1, 2015 (modified August 31, 2016 and September 6, 2016) by the Niagara Falls Water Board to Cascades Containerboard Packaging, Inc. (formerly Norampac Industries, Inc. and formerly Frontier Chemical Site PRP Group) in Niagara Falls, New York (Site). The report presents the analytical data and field measurements taken for the semiannual period covering June 2016 through November 2016. The data collected have been used to calculate the volume of groundwater and the chemical loading associated with the groundwater that discharges into the Falls Street Tunnel (FST) and the 47th Street Tunnel, which are located immediately adjacent to the Frontier Chemical Site.

1. Data Collection

Groundwater levels were measured in all of the available monitoring wells in the A Zone and B Zone of the bedrock formation at the Site. The groundwater levels were measured on October 24, 2016, and the data are presented on attached Figures 1 and 2.

Groundwater samples were collected from the following monitoring wells on October 25 and 26, 2016 and analyzed for the list of parameters specified in Paragraphs F and G of the Permit.

A Zone

- MW01-9A
- MW88-13A
- BH87-28
- BH-87-3A

GHD
2055 Niagara Falls Boulevard Niagara Falls New York 14304 USA
T 716 297 6150 **F** 716 297 2265 **W** www.ghd.com

B Zone

- BH87-3B
- MW-9
- MW-12
- MW-13

2. Flow Calculation

The groundwater flow volume is calculated based upon the thickness of the bedrock aquifer through which the groundwater flows, the aquifer permeability, and the gradient (slope) of the groundwater table. These three factors are combined, using Darcy's Law of hydraulic flow, to determine the flow volume (Flow = permeability x gradient x cross sectional saturated area). The groundwater gradients used in the flow calculation are presented on Figures 1 and 2. The calculation of groundwater flow is presented in Table 1. The Bedrock A Zone migration boundary along the south side of the Site has been divided into the west side and the east side. The October 2016 groundwater levels show that a portion of the A Zone groundwater discharge from the western half of the Site continues to discharge towards Royal Avenue. The most likely receiver of the A Zone groundwater in this area is the underlying B Zone, which is captured by the 47th Street Tunnel.

The calculated volume of groundwater discharge to the tunnels from the entire Site for the June 2016 through November 2016 time period is 1,809 gallons per day.

It is noted that the groundwater in the B Zone continues to flow to the east toward 47th Street with no migration to the south. This flow pattern is consistent with the pattern that developed after the closure of a portion of the FST and was first measured during the October 19, 2012 groundwater monitoring event.

3. Loading Calculation

The chemical loading to the tunnel sewer system is determined by multiplying groundwater flow volume by the concentration of the chemicals in the groundwater at the downgradient boundary of the Site, adjacent to where the groundwater enters the tunnels. Since there are multiple wells available along the tunnels, the chemical concentrations of this group of wells have been averaged to provide the best estimate of chemical loading. The concentrations of chemicals present in the October 2016 groundwater samples and the calculated chemical loadings to the tunnel sewers for each individual compound for each flow zone are presented in Tables 2a, 2b, 2c, 3a, and 3b. The total daily chemical loading for each compound is summarized in Table 4.

4. Discharge Limitations

The calculated volume of groundwater discharge to the tunnels and the associated chemical loadings have been compared to the limitations of the Permit (see Table 5). The calculations show that all parameters are within the Permit limits.

It is noted that while it is expected that the chemical loadings will decrease over time, some variability should be expected in the groundwater hydraulics and concentrations used to calculate the infiltration conditions and, therefore, some flexibility is needed in the Permit limits for the Site. It is believed that the Permit limits are reasonable, given the current conditions and making allowance for some continued variation over time. However, if conditions change, modifications may be necessary.

5. Next Report

The next semiannual report will be submitted to the Niagara Falls Water Board by May 31, 2017.

Should you have any questions, please contact me.

Sincerely,

GHD

Shaun McEvoy

SM/adh/3

Encl. - SIU Permit Calculations and Permit Submittal Sheets

cc: Rick Roll, Niagara Falls Water Board
Paul Drof, Niagara Falls Water Board
Bill Rajczak, Cascades Containerboard Packaging, Inc.
Michelle Hamm, Cascades Containerboard Packaging, Inc.

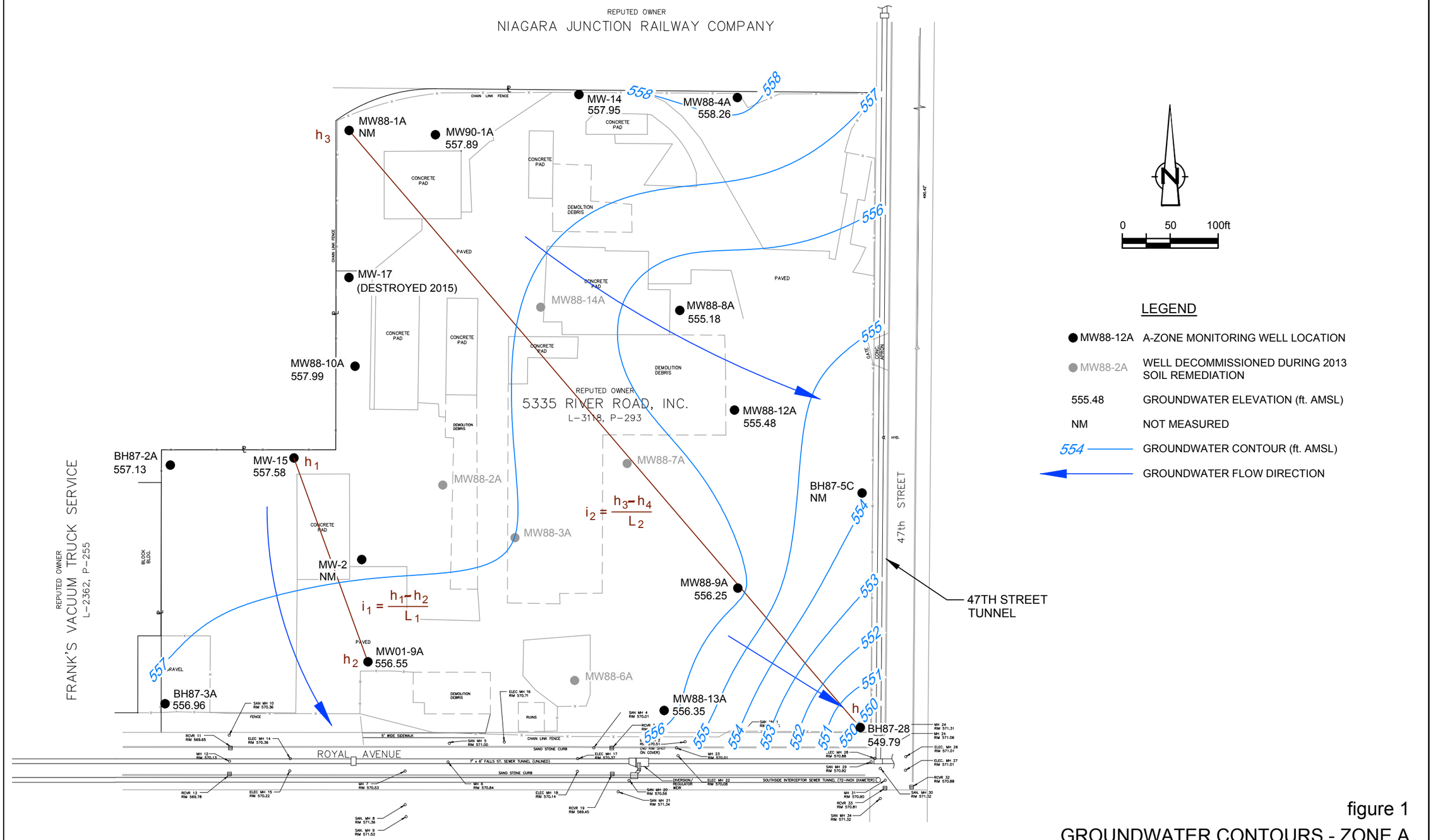
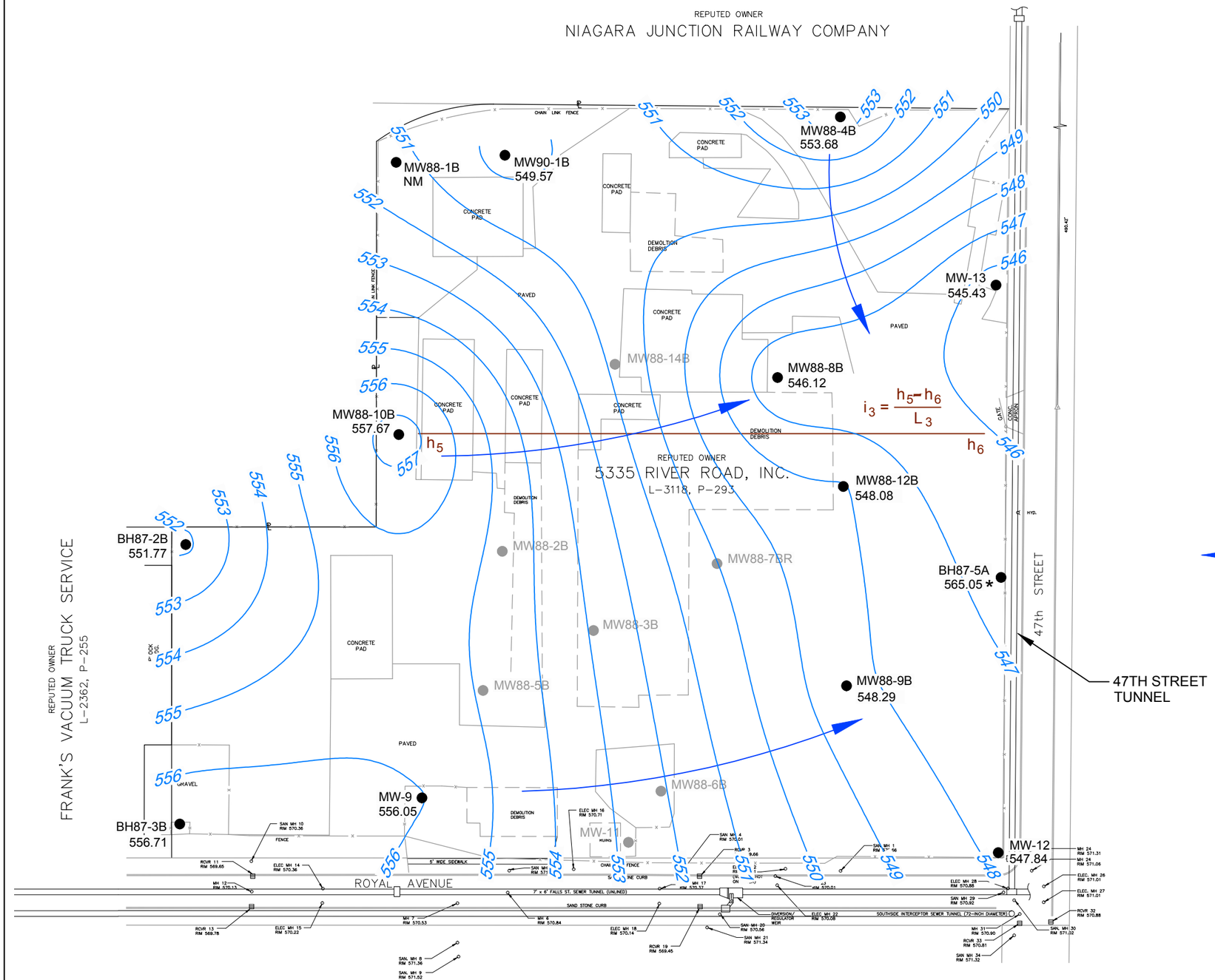


figure 1

GROUNDWATER CONTOURS - ZONE A
OCTOBER 2016
CASCADES CONTAINERBOARD PACKAGING, NIAGARA FALLS DIVISION
Niagara Falls, New York



LEGEND

● MW88-12B	B-ZONE MONITORING WELL LOCATION
● MW88-2B	WELL DECOMMISIONED DURING 2013 SOIL REMEDIATION
548.08	GROUNDWATER ELEVATION (ft. AMSL)
NM	NOT MEASURED
550 ———	GROUNDWATER CONTOUR (ft. AMSL)
◄———	GROUNDWATER FLOW DIRECTION
*	ANOMOLOUS VALUE, NOT USED IN CONTOURING

figure 2

GROUNDWATER CONTOURS - ZONE B
OCTOBER 2016
CASCADES CONTAINERBOARD PACKAGING, NIAGARA FALLS DIVISION
Niagara Falls, New York

Table 1

October 2016 Groundwater Flow Rate Estimate
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

A) Bedrock A-Zone (Figure 1)

Royal Avenue West Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h_1-h_2
= 1.03 ft

Distance between h_1 & h_2 = 226 ft

i = 1.03/226 = 0.0046

Flow Width: 440 ft
K = 2.5 x 10^{-5} to 5.2 x 10^{-5} ft/sec
Flow rate: = 5 ft x 0.0046 x 440 ft x 5.2 x 10^{-5} ft/sec
= 5.2 x 10^{-4} ft^3/sec
= 340 USgal/day
= 124,134 USgal/year

Royal Avenue East Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h_3-h_4
= 8.11 ft

Distance between h_3 & h_4 = 821 ft

i = 8.19/821 = 0.0099

Flow Width: 300 ft
K = 2.5 x 10^{-5} to 5.2 x 10^{-5} ft/sec
Flow rate: = 5 ft x 0.0099 x 300 ft x 5.2 x 10^{-5} ft/sec
= 7.7 x 10^{-4} ft^3/sec
= 499 USgal/day
= 182,153 USgal/year

47th Street South Side
Flow Thickness: Upper 3 to 5 feet of bedrock
Head Difference: = h_3-h_4
= 8.11 ft

Distance between h_3 & h_4 = 821 ft

i = 8.11/821 = 0.0099

Flow Width: 425 ft
K = 2.5 x 10^{-5} to 5.2 x 10^{-5} ft/sec
Flow rate: = 5 ft x 0.0099 x 425 ft x 5.2 x 10^{-5} ft/sec
= 1.09 x 10^{-3} ft^3/sec
= 707 USgal/day
= 258,051 USgal/year

Notes:

See Figure 1 for locations of h_1, h_2, h_3, and h_4.

Table 1

October 2016 Groundwater Flow Rate Estimate
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

B) Bedrock B-Zone (Figure 2)

Flow Thickness: 2-foot-thick fracture zone from 8 to 10 feet beneath A-Zone
Flow from B-Zone discharges to the east

• Easterly Flow:

Head Difference: = h_5-h_6 = 11 feet
Distance between h_5 & h_6 = 500 ft
Gradient (i): = 0.022
Flow Width: = 660 ft
Hydraulic Conductivity: = 1.4×10^{-5} ft/sec
Flow rate: = 2 ft x 0.022 x 660 ft x 1.4×10^{-5} ft/sec
= 4.06×10^{-4} ft^3/sec
= 263 USgal/day
= 95,903 USgal/year

Notes:

See Figure 2 for locations of h_5 and h_6.

Table 2A

A-Fracture Zone Bedrock, Royal Avenue West Side Discharge
October 2016 Chemical Flux
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells MW-01-9A 10/25/2016	Adjacent Wells BH87-3A 10/26/2016	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**350/380**	200 U	192.5	0.0005
1,2,4-Trichlorobenzene	**11 J/14 J**	200 U	16.3	0.0000
1,2-Dichlorobenzene	**230/250**	**400**	320.0	0.0009
1,3-Dichlorobenzene	**320/360**	**970**	655.0	0.0019
1,4-Dichlorobenzene	**340/390**	**1800**	1082.5	0.0031
Acetone	**42 J/61 J**	1000 U	75.8	0.0002
Benzene	**110/120**	200 U	67.5	0.0002
Chlorobenzene	**490/530**	**1600**	1055.0	0.0030
cis-1,2-Dichloroethene	**150/160**	**55 J**	105.0	0.0003
Tetrachloroethene	**4 J/100 U**	200 U	13.5	0.0000
Toluene	**71/83 J**	200 U	48.5	0.0001
Trichloroethene	**6.8 J/100 U**	**51 J**	29.7	0.0001
Vinyl chloride	**250/270**	200 U	140.0	0.0004
Monochlorotoluene	**1270/1400**	**305 J**	820.0	0.0023
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**101/65.9**	**16.6**	50.1	0.0001
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**36.3/34.4**	15 U	18.5	0.0001
Iron	**639/673**	**93**	374.5	0.0011
Potassium	**1180000/1190000**	**52400**	618700.0	1.7548
Sodium	**217000/222000**	**59300**	139400.0	0.3954

Notes:

(1) - For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) - For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) - Flow rate = 340 US gallons/day
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2B

A-Fracture Zone Bedrock, Royal Avenue East Side Discharge
October 2016 Chemical Flux
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells BH87-28 10/26/2016	MW-88-6A	MW-88-13A 10/26/2016	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	**24**	**NS**	**710**	367.0	0.0015
1,2,4-Trichlorobenzene	20 U	**NS**	**370 J**	186.0	0.0008
1,2-Dichlorobenzene	**130**	**NS**	**4700**	2415.0	0.0101
1,3-Dichlorobenzene	**100**	**NS**	**1200**	650.0	0.0027
1,4-Dichlorobenzene	**92**	**NS**	**2600**	1346.0	0.0056
Acetone	**8.0 J**	**NS**	**300 J**	154.0	0.0006
Benzene	**410**	**NS**	**1100**	755.0	0.0031
Chlorobenzene	**160**	**NS**	**1400**	780.0	0.0032
cis-1,2-Dichloroethene	**380**	**NS**	**740**	560.0	0.0023
Tetrachloroethene	20 U	**NS**	**1700**	851.0	0.0035
Toluene	**38**	**NS**	**360 J**	199.0	0.0008
Trichloroethene	20 U	**NS**	**2800**	1401.0	0.0058
Vinyl chloride	**250**	**NS**	500 U	150.0	0.0006
Monochlorotoluene	**88**	**NS**	**4800**	2444.0	0.0102
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**72**	**NS**	**291**	181.5	0.0008
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**22.7**	**NS**	**296**	159.4	0.0007
Iron	**233**	**NS**	**6710**	3471.5	0.0145
Potassium	**4830000**	**NS**	**1650000**	3240000.0	13.4873
Sodium	**348000**	**NS**	**286000**	317000.0	1.3196

Notes:

(1) - For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) - For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) - Flow rate = 499 US gallons/day
NS - Not sampleable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2C

A-Fracture Zone Bedrock, 47th Street Discharge
October 2016 Chemical Flux
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells: BH87-28 10/26/2016	Adjacent Wells: BH87-5C	Average Concentration (µg/L) Adjacent Wells	Mass Flux (pounds/day) Adjacent Wells
VOCs by Method OLM04.2 (µg/L)				
1,1-Dichloroethane	**24**	NS	24.0	0.00014
1,2,4-Trichlorobenzene	20 U	NS	0.0	0.00000
1,2-Dichlorobenzene	**130**	NS	130.0	0.00077
1,3-Dichlorobenzene	**100**	NS	100.0	0.00059
1,4-Dichlorobenzene	**92**	NS	92.0	0.00054
Acetone	**8.0 J**	NS	8.0	0.00005
Benzene	**410**	NS	410.0	0.00242
Chlorobenzene	**160**	NS	160.0	0.00094
cis-1,2-Dichloroethene	**380**	NS	380.0	0.00224
Tetrachloroethene	20 U	NS	0.0	0.00000
Toluene	**38**	NS	38.0	0.00022
Trichloroethene	20 U	NS	0.0	0.00000
Vinyl chloride	**250**	NS	250.0	0.00147
Monochlorotoluene	**88**	NS	88.0	0.00052
SVOCs by Method OLM04.2 (µg/L)				
Phenol	**72**	NS	72.0	0.00042
TAL Metals by Method ILM04.0 (µg/L)				
Arsenic	**22.7**	NS	22.7	0.00013
Iron	**233**	NS	233.0	0.00137
Potassium	**4830000**	NS	4830000.0	28.48703
Sodium	**348000**	NS	348000.0	2.05248

Notes:

(1) - For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) - For U values where compound was not detected in any listed wells, the average concentration was set to 0 µg/L
(3) - Flow rate = 707 US gallons/day
NS - Well not sampled (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration
U - Not detected at the associated reporting limit

Table 3A

B-Fracture Zone Bedrock - Southerly Discharge
October 2016 Chemical Flux
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells					Average Concentration (µg/L) Southerly Discharge	Mass Flux (pounds/day) Adjacent Wells
	MW-9 10/26/2016	MW-11	MW-12 10/25/2016	BH87-3B 10/26/2016	MW-88-6B		
VOCs by Method OLM04.2 (µg/L)							
1,1-Dichloroethane	**160**	**NS**	40 U	50 U	**NS**	56.3	0.0000
1,2,4-Trichlorobenzene	100 U	**NS**	40 U	50 U	**NS**	0.0	0.0000
1,2-Dichlorobenzene	**22 J**	**NS**	40 U	**44 J**	**NS**	23.3	0.0000
1,3-Dichlorobenzene	**53 J**	**NS**	40 U	**97**	**NS**	51.3	0.0000
1,4-Dichlorobenzene	**51 J**	**NS**	40 U	**140**	**NS**	65.0	0.0000
Acetone	500 U	**NS**	200 U	250 U	**NS**	0.0	0.0000
Benzene	100 U	**NS**	40 U	**8.2 J**	**NS**	7.4	0.0000
Chlorobenzene	**51 J**	**NS**	40 U	**350**	**NS**	135.0	0.0000
cis-1,2-Dichloroethene	100 U	**NS**	40 U	**41 J**	**NS**	18.3	0.0000
Tetrachloroethene	100 U	**NS**	40 U	**7.8 J**	**NS**	7.3	0.0000
Toluene	100 U	**NS**	40 U	50 U	**NS**	0.0	0.0000
Trichloroethene	100 U	**NS**	40 U	**37 J**	**NS**	17.0	0.0000
Vinyl chloride	100 U	**NS**	40 U	**9.7 J**	**NS**	7.9	0.0000
Monochlorotoluene	**93**	**NS**	40 U	**24 J**	**NS**	40.3	0.0000
SVOCs by Method OLM04.2 (µg/L)							
Phenol	**17.6**	**NS**	**8.4 J**	10 U	**NS**	12.0	0.0000
TAL Metals by Method ILM04.0 (µg/L)							
Arsenic	**35.6**	**NS**	**20.5**	**6.1 J**	**NS**	20.7	0.0000
Iron	**349**	**NS**	**165**	**246**	**NS**	253.3	0.0000
Potassium	**1880000**	**NS**	**5840000**	**112000**	**NS**	1984062.7	0.0000
Sodium	**268000**	**NS**	**437000**	**63700**	**NS**	256233.3	0.0000

Notes:

(1) - For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) - For U values where compound was not detected in any listed well, the average concentration was set to 0 µg/L
(3) - Flow rate = 0 US gallons/day
NS - Not sampleable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration
U - Not detected at the associated reporting limit

Table 3B

B-Fracture Zone Bedrock - Easterly Discharge
October 2016 Chemical Flux
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

Analyte	Adjacent Wells			Average Concentration (µg/L) Easterly Discharge	Mass Flux (pounds/day) Adjacent Wells
	MW-12 10/25/2016	MW-13 10/25/2016	BH87-5A		
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	40 U	25 U	NS	0.0	0
1,2,4-Trichlorobenzene	40 U	25 U	NS	0.0	0
1,2-Dichlorobenzene	40 U	25 U	NS	0.0	0
1,3-Dichlorobenzene	40 U	**3.6 J**	NS	3.8	8.33719E-06
1,4-Dichlorobenzene	40 U	**4.7 J**	NS	4.4	9.54389E-06
Acetone	200 U	**15 J**	NS	17.5	3.8395E-05
Benzene	40 U	25 U	NS	0.0	0
Chlorobenzene	40 U	25 U	NS	0.0	0
cis-1,2-Dichloroethene	40 U	25 U	NS	0.0	0
Tetrachloroethene	40 U	25 U	NS	0.0	0
Toluene	40 U	25 U	NS	0.0	0
Trichloroethene	40 U	25 U	NS	0.0	0
Vinyl chloride	40 U	25 U	NS	0.0	0
Monochlorotoluene	40 U	**210**	NS	107.0	0.000234758
SVOCs by Method OLM04.2 (µg/L)					
Phenol	**8.4 J**	10 U	NS	4.7	1.03118E-05
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	**20.5**	**5.9 J**	NS	13.2	2.89608E-05
Iron	**165**	**5080**	NS	2622.5	0.005753761
Potassium	**5840000**	**23300**	NS	2931650.0	6.432035996
Sodium	**437000**	**122000**	NS	279500.0	0.613222609

Notes:

(1) - For U Values where compound was detected in one or more of the listed wells, 10 percent of U value was used to calculate average concentration
(2) - For U values where compound was not detected in any listed well, the average concentration was set to 0 µg/L
(3) - Flow rate = 263 US gallons/day
NS - Not sampleable (Abandoned)
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List
J - Estimated concentration
U - Not detected at the associated reporting limit

Table 4

Total Chemical Flux
October 2016
Cascades Containerboard Packaging, Inc. - Frontier Site
Niagara Falls, New York

Analyte	Zone A Royal Ave West Side Mass Flux Adjacent Wells (pounds/day)	Zone A Royal Avenue East Side Mass Flux Adjacent Wells (pounds/day)	Zone A 47th Street Mass Flux Adjacent Wells (pounds/day)	Zone B Easterly Flow Mass Flux Adjacent Wells (pounds/day)	Total (pounds/day)
VOCs by Method OLM04.2 (µg/L)					
1,1-Dichloroethane	0.0005	0.0015	0.0001	0.0000	0.0021
1,2,4-Trichlorobenzene	0.0000	0.0008	0.0000	0.0000	0.0008
1,2-Dichlorobenzene	0.0009	0.0101	0.0008	0.0000	0.0118
1,3-Dichlorobenzene	0.0019	0.0027	0.0006	< 0.0001	0.0052
1,4-Dichlorobenzene	0.0031	0.0056	0.0005	< 0.0001	0.0092
Acetone	0.0002	0.0006	0.0000	< 0.0001	0.0008
Benzene	0.0002	0.0031	0.0024	0.0000	0.0057
Chlorobenzene	0.0030	0.0032	0.0009	< 0.0000	0.0071
cis-1,2-Dichloroethene	0.0003	0.0023	0.0022	< 0.0000	0.0048
Tetrachloroethene	0.0000	0.0035	0.0000	< 0.0000	0.0035
Toluene	0.0001	0.0008	0.0002	0.0000	0.0011
Trichloroethene	0.0001	0.0058	0.0000	< 0.0000	0.0059
Vinyl chloride	0.0004	0.0006	0.0015	0.0000	0.0025
Monochlorotoluene	0.0023	0.0103	0.0005	0.0002	0.0133
TOTAL VOCs	0.0131	0.0509	0.0098	0.0002	0.0741
SVOCs by Method OLM04.2 (µg/L)					
Phenol	0.0001	0.0008	0.0004	< 0.0001	0.0013
TAL Metals by Method ILM04.0 (µg/L)					
Arsenic	0.0001	0.0007	0.0001	< 0.0001	0.0009
Iron	0.0011	0.0145	0.0014	0.00575	0.0228
Potassium	1.7548	13.4873	28.4870	6.43204	50.1611
Sodium	0.3954	1.3196	2.0525	0.61322	4.3807

Notes:

VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
TAL - Target Analyte List

Table 5

Comparisons of Loading to Interim Discharge Limitations
Cascades Containerboard Packaging, Inc. - Frontier Site - October 2016
Niagara Falls, New York

Outfall Number / Effluent Parameter	Discharge Limitations: Annual Average	Discharge Limitations: Daily Maximum	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type	Calculated Daily Discharge October 2016 - pounds/day Except as noted (gallons/day)
MS #1 Flow		4000	gallons/day	2 per year	See E-2	1809
MS #1 Arsenic		0.008	pounds/day	2 per year	See E-3	0.0009
MS#1 Iron		0.24	pounds/day	2 per year	See E-3	0.0228
MS #1 Potassium		400	pounds/day	2 per year	See E-3	50.1611
MS #1 Sodium		40	pounds/day	2 per year	See E-3	4.3807
MS #1 T. Phenol		0.05	pounds/day	2 per year	See E-3	0.0013
MS #1 1,1-Dichloroethane		0.13	pounds/day	2 per year	See E-3	0.0021
MS#1 1,2,4-Trichlorobenzene		0.026	pounds/day	2 per year	See E-3	0.0008
MS #1 1,2-Dichlorobenzene		0.26	pounds/day	2 per year	See E-3	0.0118
MS #1 1,3-Dichlorobenzene		0.11	pounds/day	2 per year	See E-3	0.0052
MS#1 1,4-Dichlorobenzene		0.17	pounds/day	2 per year	See E-3	0.0092
MS #1 Acetone		0.026	pounds/day	2 per year	See E-3	0.0008
MS #1 Benzene		0.15	pounds/day	2 per year	See E-3	0.0058
MS #1 Chlorobenzene		0.1	pounds/day	2 per year	See E-3	0.0071
MS #1 Cis-1,2-Dichloroethene		0.06	pounds/day	2 per year	See E-3	0.0048
MS #1 Tetrachloroethene		0.05	pounds/day	2 per year	See E-3	0.0035
MS#1 Toluene		0.03	pounds/day	2 per year	See E-3	0.0011
MS #1 Trichloroethene		0.15	pounds/day	2 per year	See E-3	0.0059
MS #1 Vinyl Chloride		0.012	pounds/day	2 per year	See E-3	0.0025
MS #1 Monochlorotoluene		0.2	pounds/day	2 per year	See E-3	0.0133

Attachment A
SIU Permit Calculations and Permit Sheets

NIAGARA FALLS WATER BOARD
WASTEWATER FACILITIES
ENFORCEMENT DIVISION

SELF-MONITORING REPORT
SIGNIFICANT INDUSTRIAL USERS

PERMIT NO. 078 SEMIANNUAL JUNE 2016 – NOVEMBER 2016

INDUSTRY NAME: Cascades Containerboard Packaging, Inc. – Frontier Site

Pursuant to federal pretreatment reporting requirements and the Niagara Falls Water Board Regulations Part 1960, Significant Industrial Users shall submit periodic self-monitoring and compliance reports. Such reports shall be submitted using this form, according to the following schedule:

Quarterly	-	1st Quarter by February 28th
	-	2nd Quarter by May 31st
	-	3rd Quarter by August 31st
	-	4th Quarter by November 30th
Semiannual	-	by May 31st and
	-	by November 30th

Each section of this report form shall be filled out for those parameters listed in Section "G" of the company's Wastewater Discharge Permit. The analysis results must be reported in both concentration and mass. In addition, the calculated annual average load (pounds/day) for each pollutant shall also be reported.

The samples shall be collected at the monitoring points identified in the user permit. Identification of those points in this report should be as listed on page two (2) of the User Permit.

SELF-MONITORING REPORT
Significant Industrial Users (SIUs)

PAGE 2

PART II of the report is the Compliance Monitoring section. The user is obligated to determine if the analysis results indicates compliance. All violations noted should be brought to the Niagara Falls Water Board – Wastewater Facilities attention immediately upon noting and should also be reported in this section. The analysis result should be compared against all applicable federal, state and local standards and limitations. If no violations are noted then **"NO VIOLATIONS"** should appear on the report.

Pursuant to 40 CFR Part 403.12g of the Federal Standards, all violations noted must be followed up by a sample recollect/analysis and the results submitted to the Niagara Falls Water Board within thirty (30) days of first becoming aware of the violation.

Pursuant to 40 CFR Part 403.12g all Periodic Self-Monitoring Reports must be signed by a "responsible company official" certifying the following statement:

> I, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: 

Title: Consultant for Cascades Containerboard Packaging, Inc.

Date: November 23, 2016

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Cascades Containerboard Packaging, Inc. – Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone Royal Avenue- West Side**

	RESULTS		RESULTS		ANNUAL AVERAGE	ANNUAL AVERAGE
	µg/L	/ µg/L	pounds/day	/pounds/day	µg/L	pounds/day
DATE SAMPLED: October 25-26, 2016						
24-HOUR FLOW IN MGD	0.00034				0.00123	
BENZENE	68		0.0002		164	0.0024
MONOCHLOROBENZENE	1,055		0.0030		1,175	0.0130
1,2 – DICHLOROBENZENE	320		0.0009		635	0.0089
1,3 – DICHLOROBENZENE	655		0.0019		1,115	0.0149
1,4 – DICHLOROBENZENE	1,083		0.0031		1,304	0.0150
1,2,4 - TRICHLOROBENZENE	16		0.0000		36	0.0005
1,1 - DICHLOROETHANE	193		0.0005		453	0.0066
CIS – 1,2 - DICHLOROETHYLENE	105		0.0003		409	0.0074
ACETONE	76		0.0002		241	0.0037
TETRACHLOROETHYLENE	13.5		0.0000		135	0.0023
TOLUENE	49		0.0001		181	0.0028
TRICHLOROETHYLENE	385		0.0068		201	0.0035
VINYL CHLORIDE	140		0.0004		140	0.0015
MONOCHLOROTOLUENES	820		0.0023		2,078	0.0593
TOTAL PHENOL	50		0.0001		383	0.0064
ARSENIC	19		0.0001		35	0.0005
IRON	375		0.0011		447	0.0046
POTASSIUM	618,700		1.7548		677,100	7.3721
SODIUM	139400		0.3954		199,475	2.4896

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Cascades Containerboard Packaging, Inc. – Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A Zone - Royal Avenue East Side**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 25-26, 2016						
24-HOUR FLOW IN MGD	0.00050				0.00052	
BENZENE	755		0.0031		860	0.0037
MONOCHLOROBENZENE	780		0.0032		913	0.0040
1,2 - DICHLOROBENZENE	2415		0.0101		2,333	0.0101
1,3 - DICHLOROBENZENE	650		0.0027		690	0.0030
1,4 - DICHLOROBENZENE	1,346		0.0056		1,306	0.0057
1,2,4 - TRICHLOROBENZENE	186		0.0008		179	0.0008
1,1 - DICHLOROETHANE	367		0.0015		420	0.0018
CIS – 1,2 - DICHLOROETHYLENE	560		0.0023		615	0.0027
ACETONE	154		0.0006		156	0.0007
TETRACHLOROETHYLENE	851		0.0035		876	0.0038
TOLUENE	199		0.0008		231	0.0010
TRICHLOROETHYLENE	1,401		0.0058		1,502	0.0065
VINYL CHLORIDE	150		0.0006		135	0.0006
MONOCHLOROTOLUENES	2,444		0.0102		2,426	0.0105
TOTAL PHENOL	182		0.0008		203	0.0011
ARSENIC	159		0.0007		136	0.0006
IRON	3,472		0.0145		2,523	0.0108
POTASSIUM	3,240,000		13.4873		3,315,000	14.3369
SODIUM	317,000		1.3196		327,000	1.4147

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Cascades Containerboard Packaging, Inc. – Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock A-Zone 47th Street**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 25-26, 2016						
24-HOUR FLOW IN MGD	0.00071				0.00062	
BENZENE	410		0.0024		420	0.0022
MONOCHLOROBENZENE	160		0.0009		175	0.0009
1,2 - DICHLOROBENZENE	130		0.0008		165	0.0009
1,3 - DICHLOROBENZENE	100		0.0006		130	0.0007
1,4 - DICHLOROBENZENE	92		0.0005		111	0.0006
1,2,4 - TRICHLOROBENZENE	0		0.0000		0.7	0.0000
1,1-DICHLOROETHANE	24		0.0001		25	0.0001
CIS – 1,2 - DICHLOROETHYLENE	380		0.0022		450	0.0023
ACETONE	8.0		0.0001		6.4	0.0000
TETRACHLOROETHYLENE	0		0.0000		0.3	0.0000
TOLUENE	38		0.0002		37	0.0002
TRICHLOROETHYLENE	0		0.0000		1.5	0.0000
VINYL CHLORIDE	250		0.0015		220	0.0011
MONOCHLOROTOLUENES	115		0.0005		123	0.0006
TOTAL PHENOL	88		0.0004		86	0.0004
ARSENIC	22.7		0.0001		24.7	0.0001
IRON	233		0.0014		117	0.0007
POTASSIUM	4,830,000		28.4870		4,880,000	24.9571
SODIUM	348,000		2.0525		361,500	1.8412

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Cascades Containerboard Packaging, Inc. – Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (South)**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 25-26, 2016						
24-HOUR FLOW IN MGD	0.000000[(1)]				0.000000	
BENZENE	7.4		0.0000		11	0.0000
MONOCHLOROBENZENE	135		0.0000		124	0.0000
1,2 – DICHLOROBENZENE	23		0.0000		35	0.0000
1,3 - DICHLOROBENZENE	51		0.0000		61	0.0000
1,4 - DICHLOROBENZENE	65		0.0000		72	0.0000
1,2,4 - TRICHLOROBENZENE	0		0.0000		1	0.0000
1,1 - DICHLOROETHANE	56		0.0000		57	0.0000
CIS – 1,2 - DICHLOROETHYLENE	18		0.0000		30	0.0000
ACETONE	0		0.0000		8.5	0.0000
TETRACHLOROETHYLENE	7.3		0.0000		6.3	0.0000
TOLUENE	0		0.0000		3.7	0.0000
TRICHLOROETHYLENE	17		0.0000		17	0.0000
VINYL CHLORIDE	7.9		0.0000		17	0.0000
MONOCHLOROTOLUENES	40		0.0000		51	0.0000
TOTAL PHENOL	12		0.0000		29	0.0000
						0.0000
ARSENIC	21		0.0000		23	0.0000
IRON	253		0.0000		286	0.0000
POTASSIUM	1984063		0.0000		2,398,698	0.0000
SODIUM	256,233		0.0000		290,167	0.0000

[(1)] No discharge to south for the time period June 2016 through November 2016.

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Cascades Containerboard Packaging, Inc. – Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Monitoring Wells in Bedrock B Zone (East)**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 25-26, 2016						
24-HOUR FLOW IN MGD	0.00026				0.00027	
BENZENE	0.0		0.0		0.0	0.0
MONOCHLOROBENZENE	0.0		0.0		4.5	<0.0001
1,2 - DICHLOROBENZENE	0.0		0.0		0.0	0.0
1,3 - DICHLOROBENZENE	3.8		<0.0001		4.9	<0.0001
1,4 - DICHLOROBENZENE	4.4		<0.0001		6.2	<0.0001
1,2,4 - TRICHLOROBENZENE	0.0		0.0		0.0	0.0
1,1 - DICHLOROETHANE	0.0		0.0		3.7	<0.0001
CIS – 1,2 - DICHLOROETHYLENE	0.0		0.0		18	<0.0001
ACETONE	18		<0.0001		9	<0.0001
TETRACHLOROETHYLENE	0.0		0.0		0.0	0.0
TOLUENE	0.0		0.0		0.0	0.0
TRICHLOROETHYLENE	0.0		0.0		3.3	<0.0001
VINYL CHLORIDE	0.0		0.0		0.0	0.0
MONOCHLOROTOLUENES	107		0.0002		147	0.0003
TOTAL PHENOL	4.7		<0.0001		8.5	<0.0001
ARSENIC	13		<0.0001		14	<0.0001
IRON	2,623		0.0058		1,558	0.0035
POTASSIUM	2,931,650		6.4320		2,968,475	6.751
SODIUM	279,500		0.6132		295,750	0.6736

PART I

ANALYTICAL RESULTS

SIU PERMIT NAME: **Cascades Containerboard Packaging, Inc. – Frontier Site**

SIU PERMIT NO.: **078**

SAMPLE LOCATION: **Total Sum of Bedrock A and B Zones**

	RESULTS µg/L	/ µg/L	RESULTS pounds/day	/pounds/day	ANNUAL AVERAGE µg/L	ANNUAL AVERAGE pounds/day
DATE SAMPLED: October 25-26, 2016						
24-HOUR FLOW IN MGD	0.001809				0.002633	
BENZENE			0.0058			0.0083
MONOCHLOROBENZENE			0.0071			0.0178
1,2 - DICHLOROBENZENE			0.0118			0.0198
1,3 - DICHLOROBENZENE			0.0052			0.0185
1,4 - DICHLOROBENZENE			0.0092			0.0212
1,2,4 - TRICHLOROBENZENE			0.0008			0.0013
1,1 - DICHLOROETHANE			0.0021			0.0085
CIS – 1,2 - DICHLOROETHYLENE			0.0048			0.0123
ACETONE			0.0008			0.0044
TETRACHLOROETHYLENE			0.0036			0.0060
TOLUENE			0.0012			0.0040
TRICHLOROETHYLENE			0.0059			0.0100
VINYL CHLORIDE			0.0025			0.0032
MONOCHLOROTOLUENES			0.0133			0.0447
TOTAL PHENOL			0.0013			0.0077
ARSENIC			0.0009			0.0012
IRON			0.0228			0.0196
POTASSIUM			50.1611			53.417
SODIUM			4.3807			6.419

PART II

COMPLIANCE MONITORING

SIU NAME: Cascades Containerboard Packaging, Inc. – Frontier Site

PERMIT NO.: 078

NO VIOLATIONS

VIOLATION PARAMETER	DATE	FLOW [MGD]	SAMPLE POINT LOCATION	ACTUAL* DISCHARGE	PERMIT LIMIT	TYPE** LIMIT VIOLATED

NOTE:

* - Actual discharge – list actual analytical results and appropriate units.

** - Type Limit Violated – List Type:

A.A. = Annual Average

D.M. = Daily Maximum

L.L. = Local Limits (Regulation 1960.5)

ADMIN\WINWORD\PARADISE\SIU\SELF-MONITORING REPORT FORM - BLANK

Attachment C
Permit No. 78

This page modified 8/31/16

NIAGARA FALLS WATER BOARD

SIGNIFICANT INDUSTRIAL USER WASTEWATER DISCHARGE PERMIT

PERMIT NO. 78 Cascades Containerboard Packaging Inc. - Frontier Site

In accordance with all terms and conditions of the Niagara Falls Water Board Wastewater Regulations Part 1960 and also with all applicable provisions of Federal and State Law or regulation.

Permission is Hereby Granted To:

Cascades Containerboard Packaging Inc. - Frontier Site

Located at: **4626 Royal Avenue, Niagara Falls, NY 14303**

Classified by SIC No(s): **None, non production facility**

For the contribution of wastewater into the Niagara Falls Water Board Publicly-Owned Treatment Works (POTW).

This permit modified 8/31/16, 9/6/16

Effective this 1st day of October 2015

To expire this 1st day of October 2020

Joel R Paradise for

Paul J. Drof

Executive Director of the Niagara Falls Water Board

Signed this 29th day of September, 2015

DISCHARGE IDENTIFICATION

OUTFALL	DESCRIPTION	LOCATION	RECEIVING
MS #1	Monitoring Wells in Bedrock Zones A, B	4626 Royal Avenue	Contaminated Site Ground Water

WASTEWATER DISCHARGE PERMIT REQUIREMENTS FOR:		**ACTION REQUIRED**	**REQUIRED DATE OF SUBMISSION**
A.	**Discharges to the Niagara Falls Water Board (NFWB) Sewer**		
1.	Identification of all discharges to the NFWB Sewer System on a current plant sewer map certified by a New York State licensed professional engineer.	NONE	SUBMISSION RECEIVED 9/22/15
2.	Identification of each contributing waste stream to each discharge to the NFWB Sewer System clearly marked on, or referenced to, a current plant sewer map certified by a New York State licensed professional engineer.	NONE	SUBMISSION RECEIVED 9/22/15
3.	Elimination of all uncontaminated discharges to the NFWB Sewer System. All uncontaminated flows should be clearly identified on a current sewer map certified by a New York State licensed professional engineer.	NONE	SUBMISSION RECEIVED 9/22/15
4.	Establishment of a control manhole that is continuously and immediately accessible for each discharge to the NFWB Sewer System.	NONE	SUBMISSION RECEIVED 9/22/15
B.	**Wastewater Discharge Management Practices**		
1.	Identification of a responsible person(s) (day to day and in emergencies).	NONE	SUBMISSION RECEIVED 9/22/15

WASTEWATER DISCHARGE PERMIT REQUIREMENTS FOR:

C. Slug Control Plan**

Pursuant to Section 40 CFR 403.12 (v) of the Federal Pretreatment Standards the Niagara Falls Water Board will evaluate the permittee, a minimum of once every two years for the need for a "Slug Control Plan." If a plan is required by the Niagara Falls Water Board, then the plan will contain, at a minimum, the following elements:

a) Description of discharge practices, including non-routine batch discharges;
b) Description of stored chemicals;
c) Procedures for immediately notifying the POTW of slug discharges, including any discharge that would violate a prohibition under 40 CFR 403.5 (b), with procedures for follow-up written notification within five days;
d) If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment necessary for emergency response.

**This section applies to all pollutants limited by the Niagara Falls Water Board SPDES Permit and all prohibited wastewater discharges (See Section 1960.5 of the Niagara Falls Water Board - Wastewater Regulations).

D. General Wastewater Discharge Permit Conditions

1. Flow monitoring should be performed concurrently with any Wastewater Discharge Permit sampling and should be reported at the same time as analytical results. If it is not feasible to perform flow monitoring, an estimate of flow (method of estimated flow preapproved by the Niagara Falls Water Board) should be submitted with the analytical results.

2. All sampling for billing and pretreatment compliance purposes will be coordinated through the Niagara Falls Water Board Industrial Monitoring Coordinator

3. All analysis must be performed by a State certified laboratory using analytical methods promulgated and consistent with 40 CFR 136 and amendments thereto. The permittee will request their contract laboratory to report both Practical Quantization Limit (PQL) and Method Detection Limit (MDL). The PQL and MDL are defined in the NYSDEC Technical Guidance Series 1.3.7.

   The permittee should report results that are less than the MDL or PQL on the NFWB Self Monitoring Report, as non-detect (ND), by placing a less than sign (<) followed by the analytical result. Every effort should be made to attain results down to the MDL. If this is not possible, then results less than PQL but greater than MDL must also be additionally flagged with the qualifier "J" on the Self Monitoring Report. For example, a result less than 5 PQL would be reported <5 (J). In either case the calculated load in lbs per day would be zero.

   Monitoring results which are lower than the PQL must be reported but will not be used to determine compliance with the permit limit.

4. An estimate of relative production levels for wastewater contributing processes at the time of any pretreatment compliance sampling will be submitted upon request of the Director of Niagara Falls Water Board-Wastewater Facilities.

5. All samples will be handled in accordance with EPA approved methods. Chain of Custody records will be submitted with all sampling results.

6. All conditions, standards and numeric limitations of the Niagara Falls Water Board Wastewater Regulations are hereby incorporated into this permit by reference. These conditions, standards and numeric limitations must be complied with. Failure to comply with any part of said ordinances constitutes a violation and is subject to enforcement actions(s) described in Section 1960.9 of said Regulations, and in the Niagara Falls Water Board Pretreatment Administrative Procedure Number Five (5) - "Enforcement Response Guide." Violators are subject to all applicable Civil and Criminal penalties. In the event of a violation, including slug discharges or spills, the Niagara Falls Water Board must be notified immediately by phone and confirmed by letter within five (5) working days.

   Any person adjudicated of violating any provision in the Niagara Falls Water Board Wastewater Regulations shall be assessed a fine in the amount of up to $10,000. This amount is available for each violation, and each day of a violation is a separate incident for which penalties may be sought.

The person violating any of the provisions of the Niagara Falls Water Board Wastewater Regulations will be liable for any expense, loss, or damage occasioned by reason of such violation. The expense, loss or damage will be taken to be to the extent determined by the Director.

In addition, any person who knowingly makes any false statements; representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to the Niagara Falls Water Board Wastewater Regulations or Wastewater Discharge Permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under the Niagara Falls Water Board Wastewater Regulations will, upon conviction be punished by a fine up to $5,000. Furthermore, the Niagara Falls Water Board may recover reasonable attorney's fees, court costs, court reporting fees, and other expenses of litigation by appropriate suit at law against the person found to have violated applicable laws, orders, rules and permits required by the Niagara Falls Water Board Wastewater Regulations.

7. In accordance with Federal Regulation CFR 40, Part 403.12(g), any exceedance of a numeric limitation noted by the SIU must be re-sampled, analyzed and resubmitted to the Niagara Falls Water Board - Wastewater Facilities within 30 days.

   Specifically, if any limit that is listed in Section F of this permit is exceeded, then the permittee will undertake a short term monitoring program for that pollutant. Samples will be collected identical to those required for routine monitoring purposes and will be collected on each of at least two (2) operating days and analyzed. Results will be reported in both concentration and mass, and will be submitted within 30 days of becoming aware of the exceedance.

8. Sampling frequency for any permitted compounds may be increased beyond the requirements set forth in Section F and G of this permit. If the permittee monitors (sample and analysis) more frequent than required under this permit, **all** results of this monitoring must be reported.

9. As noted in Section 1960.5g of the Niagara Falls Water Board Wastewater Regulations, "Personnel as designated by the Director will be permitted at any time for reasonable cause to enter upon all properties served by the Niagara Falls Water Board – Wastewater Facilities for the purpose of, and to carry out, inspection of the premises, observation, measurement, sampling and testing, in accordance with provisions of the Ordinance."

10. As noted in Section 1960.5c of the Niagara Falls Water Board Regulations, significant changes in discharge characteristics or volume must be reported immediately to the Niagara Falls Water Board – Wastewater Facilities.

11. As noted in Section 1960.6b of the Niagara Falls Water Board Regulations, samples required to be collected via a 24-hour composite sampler must be retained refrigerated for an additional 24 hour plus un-refrigerated an additional 48 hours (total 78 hours).

12. As noted in Section 1960.5d of the Niagara Falls Water Board Wastewater Regulations, all "SIU's will keep on file for a minimum of three (3) years, all records, flow charts, laboratory calculations or any other pertinent data on their discharge to the Niagara Falls Water Board – Wastewater Facilities."

13. As noted in Section 1960.6g of the Niagara Falls Water Board Wastewater Regulations, "Permits are issued to a specific user for a specific monitoring station. A permit will not be reassigned or transferred without the approval of the Director which approval will not be unreasonably withheld. Any succeeding owner or user to which a permit has been transferred and approved will also comply with all the terms and conditions of the existing permit."

14. The Annual Average Limitation is equivalent to the specific SIU allocation, and will be defined as the permissible long-term average discharge of a particular pollutant. These limitations are listed in Section F of this permit. The computation of the Annual Average will be as follows; for each compound listed in Section G of this permit, the Annual Average will be the average of the present monitoring quarter and three previous quarters' data.

15. The Daily Maximum Limitation will be defined as the maximum allowable discharge on anyone day. The Daily Maximum Limitation will allow for periodic short term discharge fluctuations. These specific limitations are listed in Section F of this permit.

16. Enforcement of the Annual Average Limitation will be based on the reported average of the last four quarters data vs. the Annual Average Limited listed in Section F of this permit. Enforcement of the Daily Maximum Limitation will be based on individual analysis results vs. the Daily Maximum Limit listed in Section F of this permit. These results may be obtained from self- monitoring (Section G), Niagara Falls Water Board Verification, incident investigation or billing samples.

17. The Niagara Falls Water Board Administrative Procedure Number 6 "Procedure for Determination and Use of Local Limits" lists all pollutants noted in the Niagara Fall Water Board – Wastewater Facilities SPDES Permit. The limits defined in the procedure are values which are based on the quantity of substances discharged which can be easily related to the Treatment Plant's removal capacity.

17. The pollutants listed in this procedure, which are <u>not</u> specifically listed in Section F and G of this permit, may be present in the permittee's wastewater discharge, but at levels which do not require specific permit limitations. Consequently, if any of the limits listed in this procedure, for pollutants <u>not</u> identified in Section F and G of this permit, are exceeded then the permittee will undertake a short-term, high intensity monitoring program for that pollutant. Samples identical to those required for routine monitoring purposes will be collected on each of at least three operating days and analyzed. Results will be expressed in terms of both concentration and mass, and will be submitted no later than the end of the third month following the month when the limit was first exceeded.

    If levels higher than the limit are confirmed, the permit may be reopened by the Niagara Falls Water Board for consideration of revised permit limits.

E. Specific Wastewater Discharge Permit Conditions

1. Billing Agreement:

Sewer use billing will be calculated based on the information provided in the periodic self monitoring reports and will follow the procedures outlined in the Niagara Falls Water Board Regulations for SIUs Part 1960.

2. Flow Measurement:

The permittee will not discharge wastewater in the conventional way through a point source discharge and therefore not through a typical monitoring station. As such the flow will be based on the calculation as described in the attached Table 1, pages one and two.

3. Sample Collection:

a) This site has been designated as a hazardous waste remedial site. Ground water exits the site and passively enters the NFWB combined sewers on 47th Street and Royal Avenue. The "discharge" cannot be easily, nor economically be combined into a point source discharge.

Because of this issue pollutant monitoring will be conducted by sampling monitoring wells which most accurately represent the pollutant quality of the wastewater exiting the site. The wells designated for this purpose are from the Zones A and B Fracture Bedrock. They are identified on the attached Figures 3-5 and 3-6. The original enlarged copies of these figures are contained in the original permit application.

These wells will be collectively identified as Monitoring Station #1 (MS #1).

F. Discharge Limitations & 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) will be limited and monitored by the permittee as specified below.

OUTFALL NUMBER/ EFFLUENT PARAMETER	DISCHARGE LIMITATIONS		UNITS	MINIMUM MONITORING REQUIREMENTS	
	ANNUAL AVERAGE	DAILY MAXIMUM		MEASUREMENT FREQUENCY	SAMPLE TYPE
MS #1 Flow		4,000	Gals/day	2 per year	See E-2
MS #1 Arsenic		0.008	Lbs/day	2 per year	See E-3
MS #1 Iron		0.24	Lbs/day	2 per year	See E-3
MS #1 Potassium		400	Lbs/day	2 per year	See E-3
MS #1 Sodium		40.0	Lbs/day	2 per year	See E-3
MS #1 T. Phenol		0.05	Lbs/day	2 per year	See E-3
MS #1 1,1-Dichloroethane		0.13	Lbs/day	2 per year	See E-3
MS #1 1,2,4-Trichlorobenzene		0.026	Lbs/day	2 per year	See E-3
MS #1 1,2-Dichlorobenzene		0.26	Lbs/day	2 per year	See E-3
MS #1 1,3-Dichlorobenzene		0.11	Lbs/day	2 per year	See E-3
MS #1 1,4-Dichlorobenzene		0.17	Lbs/day	2 per year	See E-3
MS #1 Acetone		0.026	Lbs/day	2 per year	See E-3
MS #1 Benzene		0.15	Lbs/day	2 per year	See E-3
MS #1 Chlorobenzene		0.10	Lbs/day	2 per year	See E-3
MS #1 Cis-1,2-Dichloroethene		0.060	Lbs/day	2 per year	See E-3
MS #1 Tetrachloroethene		0.05	Lbs/day	2 per year	See E-3
MS #1 Toluene		0.03	Lbs/day	2 per year	See E-3
MS #1 Trichloroethene		0.15	Lbs/day	2 per year	See E-3
MS #1 Vinyl Chloride		0.012	Lbs/day	2 per year	See E-3
MS #1 Monochlorotoluene		0.2	Lbs/day	2 per year	See E-3

G. Discharge Monitoring Reporting Requirements

During the period beginning the effective date of this permit and lasting until its expiration date, discharge monitoring results will be summarized and reported by the permittee; Monthly - 14 days after monitoring period, Quarterly - by the last day of the monitoring period = February 28, May 31, August 31, November 30. *Semiannual reports* will be submitted on the last day of the monitoring period = **November 30, May 31**. The annual average for each parameter listed in Section F, will be computed and reported quarterly. The individual sample analysis for present quarter will also be reported quarterly unless directed otherwise in this permit.

OUTFALL NO	PARAMETER	REPORTING FREQUENCY
MS #1	Flow	Semi-Annual
MS #1	Arsenic	Semi-Annual
MS #1	Iron	Semi-Annual
MS #1	Potassium	Semi-Annual
MS #1	Sodium	Semi-Annual
MS #1	T. Phenol	Semi-Annual
MS #1	1,1-Dichloroethane	Semi-Annual
MS #1	1,2,4-Trichlorobenzene	Semi-Annual
MS #1	1,2-Dichlorobenzene	Semi-Annual
MS #1	1,3-Dichlorobenzene	Semi-Annual
MS #1	1,4- Dichlorobenzene	Semi-Annual
MS #1	Acetone	Semi-Annual
MS #1	Benzene	Semi-Annual
MS #1	Chlorobenzene	Semi-Annual
MS #1	Cis-1,2-Dichloroethene	Semi-Annual
MS #1	Tetrachloroethene	Semi-Annual
MS #1	Toluene	Semi-Annual
MS #1	Trichloroethene	Semi-Annual
MS #1	Vinyl Chloride	Semi-Annual
MS #1	Monochlorotoluene	Semi-Annual

H. Comments/Revisions

Effective 8/31/16 this permit was revised to accommodate the corporate name change from: "Norampac Industries Inc. Niagara Falls Division" **TO:**
"Cascades Containerboard Packaging Inc. –Frontier Site".

Also removed on 8/31/16 was language pertaining to sewer access during site remediation which was completed years ago and therefore is no longer applicable.

On 9/6/16 as part of the above permit modifications, the Daily Maximum Flow was increased from 3,600 gallons to 4,000 gallons.

Attachment D
Site Management Periodic Review Report
Notice - Institutional and Engineering Controls Certificate Form

Enclosure 2

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

Site Details **Box 1**

Site No. **932110**

~~**Site Name Frontier Chemical - Royal Avenue**~~ Cascades Containerboard Packaging – Royal Avenue

Site Address: 4626 Royal Avenue Zip Code: 14303
City/Town: Niagara Falls
County: Niagara
Site Acreage: 9.8

Reporting Period: November 18, 2015 to November 18, 2016

	YES	NO
1. Is the information above correct?	☐	☑
If NO, include handwritten above or on a separate sheet.		
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	☑
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	☑
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☑	☐
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.		
5. Is the site currently undergoing development?	☐	☑

Box 2

	YES	NO
6. Is the current site use consistent with the use(s) listed below? Industrial	☑	☐
7. Are all ICs/ECs in place and functioning as designed?	☑	☐

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

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

Signature of Owner, Remedial Party or Designated Representative

Date

SITE NO. 932110 **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
160.09-1-6	4626 Royal Avenue Holding LLC	Ground Water Use Restriction Soil Management Plan Landuse Restriction Site Management Plan Monitoring Plan IC/EC Plan

Environmental Easement and Site Management Plan

Box 4

Description of Engineering Controls

Parcel	Engineering Control
160.09-1-6	Cover System

12" clean cover system consisting of crushed concrete or crushed stone with some asphalt

Box 5

Periodic Review Report (PRR) Certification Statements

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

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

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

YES	NO
☑	☐

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

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

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

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

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

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

YES	NO
☑	☐

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

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

Signature of Owner, Remedial Party or Designated Representative

Date

IC CERTIFICATIONS
SITE NO. 932110

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

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

I Michelle Hamm (print name) at 4626 Royal Avenue Niagara Falls NY 14303 (print business address)

am certifying as Cascades Containerboard PKg. (Owner or Remedial Party)
(formerly Frontier Chemicals)

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

Michelle Hamm — 12-21-16
Signature of Owner, Remedial Party, or Designated Representative Rendering Certification — Date

IC/EC CERTIFICATIONS

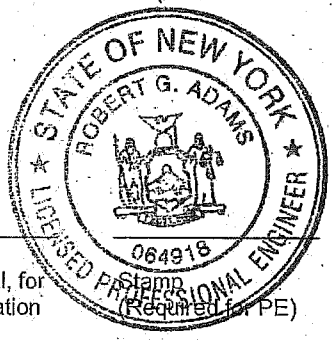
Box 7

Qualified Environmental Professional Signature

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

I ROBERT G. ADAMS at GHD CONSULTING SERVICES INC. 285 DELAWARE AVE, BUFFALO NY 14202
print name print business address

am certifying as a Qualified Environmental Professional for the OWNER
(Owner or Remedial Party)



Robert G. Adams — 12/14/16

Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

Date