Confirmation Investigation Report

Site 108-Tonawanda Coke Corporation

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1. Introduction

1.1 Purpose of Report

The properties owned by Tonawanda Coke Corporation (TCC) located at 3875 and 3800 River Road, Tonawanda, New York has been the subject of several investigations of on-Site environmental conditions since the early 1980s through the mid-2000s. These investigations were initiated in response to the combined properties being first listed on New York's Inactive Hazardous Waste Registry in 1979. The investigations that have ensued have all been conducted with the input and approval of the various New York State Department of Environmental Conservation (NYSDEC) Project Managers that have been assigned.

In response to investigations that were conducted in the 1980s and 1990s, in December, 2004, the NYSDEC sent a letter to TCC stating that additional investigation work was required to complete the assessment of the conditions concerning historic waste handling and disposal at its owned properties located at 3875 and 3800 River Road, Tonawanda, New York. The requested additional investigation was to focus on three historic waste disposal areas that have been inactive since, at the latest, prior to TCC's acquisition of the facility in 1978. These areas are identified as Operable Units 1, 2, 3, or Sites 110, 109, and 108, respectively. Figure 1.1 presents a map of the TCC properties in the context of its setting within an industrial area of the City of Tonawanda. The surrounding area includes petroleum storage facilities, steel fabrication shops, and a former Allied Chemical plant. Figure 1.1 also shows the location of Site 108, which is the focus of this investigation.

Following receipt of the letter, TCC and NYSDEC met to discuss the deficiencies identified by NYSDEC in the previous reports and the investigation components that were needed to fill the data gaps so that the assessment of the Site areas could be deemed complete. TCC prepared a Scope of Work outlining the additional investigation components that would be undertaken to fill the identified data gaps. That Scope of Work was submitted on June 21, 2005, and approved by the NYSDEC on July 5, 2005.

The original report discussing the results of the additional investigation components, and summarizing the impact of these results on the overall Site conditions assessment, was submitted to NYSDEC in April 2006. The NYSDEC reviewed the document and provided comments to TCC. At the direction of NYSDEC, the report was updated to incorporate comparisons of the soil and sediment results to the soil cleanup objectives (SCOs) in 6 NYCRR Part 375-6, Remedial Program Soil Cleanup Objectives (which were revised in December 2006). Specifically, the NYSDEC requested that the data be compared to the restricted residential and industrial land use SCOs for protection of public health. Based on these comments, a Final Supplemental Report was submitted to the NYSDEC on January 7, 2008, which included a Feasibility Study assessing potential remedial actions for the entire property locations.

On the basis of the prior investigations, NYSDEC issued a Record of Decision, dated March 31, 2008 (the ROD), identifying the proposed remedy identified for Sites 109 and 110, or Operable Units 1 and 2. In each case, the selected remedy involved the use of institutional and engineering controls.

Subsequent to the issuance of the ROD, TCC and NYSDEC maintained active discussions regarding necessary actions and remedy selection for Site 108 (the Site). In 2016, TCC and NYSDEC entered into an Order on Consent and Administrative Settlement (Index # B9-85-02-77B) outlining the need to undertake, and finalize, a revised Final Feasibility Study (FFS) for the Site. TCC provided an initial draft of the FFS, but after further discussion with NYSDEC, it was agreed that additional sampling would need to be performed prior to finalizing the document. The need for additional investigations was discussed at a meeting between NYSDEC and TCC representatives on May 2, 2016 and documented in a May 4, 2016 letter from NYSDEC to TCC's outside counsel.

The primary focus of the requested sampling is to provide further insight into the condition of on-Site soil (on the ground surface and subsurface), sediment in the Niagara River embayment, sediment in the on-Site ditch, soil near and around the former tank farm, and the extent of coal/coke/breeze material near the Niagara River.

The specifics of the additional sampling program were provided in the Confirmation Investigation Work Plan submitted by GHD, on July 29, 2016 and ultimately approved in its final form as of August 18, 2016 (Work Plan). The Work Plan originally called for a summary report to be submitted by October 14, 2016, but due to some delays in field work, approval was received from NYSDEC to submit the report by October 28, 2016.

This Confirmation Investigation Report (Report) presents the additional information specified in the Work Plan. Following review and acceptance of this report by the NYSDEC, it is expected that a Proposed Remedial Action Plan and Record of Decision can be issued for Site 108.

1.2 Site History

The TCC plant, which is located at 3875 River Road in Tonawanda, New York, and the Site (collectively with the TCC plant, the Facility) was owned and operated from 1917 through 1947 by Semet-Solvay Company, a subsidiary of Allied Chemical and Dye Corporation. In 1947, Semet-Solvay Company was merged into Allied Chemical Corporation, which owned and operated the Facility until January 27, 1978, when it was sold to TCC.

Since 1917, manufacturing processes used at the plant included by-products coking; light oil distillation; ammonia recovery; and benzene, toluene, and xylene extraction. Prior to TCC's acquisition of the Facility in 1978, a few areas of the Site were historically used for the disposal of waste. In 1973, the Semet-Solvay Division was granted permission by the Erie County Health Department to establish a new refuse disposal area located at 3800 River Road, Tonawanda, New York (now referred to as Site 108). The Site was eventually filled with refuse, wood, scrap polyethylene, and ceramic saddle packing from refining equipment. Site 108 is located on the west side of River Road, and extends to the Niagara River, as shown on Figure 1.1. Site 108 is heavily overgrown with mature trees, shrubs, and tall grasses. There are no occupied buildings on Site 108. TCC does have one building still in use that houses certain electrical equipment and pumps tied to facility operations.

Site 108 also includes a former tank farm consisting of the shells of three large above ground storage tanks, each 45 feet in diameter. The tanks have not been used since prior to TCC's purchase of the Site from Allied Chemical. In addition, prior operations at Site 108 included the

unloading of coke, coal, and coal tar that was delivered by boat. The coal was transported to the facility's main operation by underground conveyor and/or piping systems. Similar to the former tank farm, these operations ceased prior to the Site's acquisition.

1.3 Previous Investigations

Six major investigations, and several other sampling events, have been conducted at the Facility, focusing primarily on the former on-Site disposal areas. The investigations that included work on or immediately adjacent to the Site 108 included the following:

1. In July 1982 and May 1983, the United States Geological Survey (USGS) undertook the sampling of a number of inactive hazardous waste disposal sites roughly within a 3-mile wide band along the Niagara River. This sampling program was part of an overall investigation of toxic contaminant entry into the Niagara River. The USGS program involved the collection of two groundwater samples, 10 soil samples and two surface water samples from the TCC Site.

2. "Phase II Site Investigation Tonawanda Coke Site" December 1986". Prepared by Malcolm Pirnie Inc.

   The Phase II Site Investigation consisted of the following activities on Site 108:

   - Installation of two overburden groundwater monitoring wells
   - Collection of groundwater samples
   - Installation of 3 test pits
   - Collection of 3 surface water samples

3. "Supplemental Site Investigation Tonawanda Coke Corporation Tonawanda, New York July 1990". Prepared by Conestoga-Rovers & Associates.

   The Supplemental Site Investigation consisted of the following activities on Site 108:

   - Installation of one overburden groundwater monitoring well
   - Collection of groundwater samples
   - Installation of two test pits
   - Collection of one composite soil sample from the test pits
   - Collection of five surface water samples
   - Collection of two sediment samples

4. "Additional Site Investigation Tonawanda Coke Corporation Tonawanda, New York November 1992". Prepared by Conestoga-Rovers & Associates.

   The Additional Site Investigation consisted of the following activities:

   - Installation of one overburden groundwater monitoring well
   - Collection of groundwater samples

- Installation of three test pits
- Collection of two samples from the test pits
- Advancement of one borehole

All of the investigations conducted on Site 108 were subsequently summarized in the report entitled “Remedial Investigation Summary Report”. Tonawanda Coke Corporation Tonawanda, New York May 1997. Prepared by Conestoga-Rovers & Associates (Summary Report).

The Summary Report assembled all of the available information from the previous investigations performed at the Facility pertaining to groundwater, surface water, soils, and sediments and discussed their significance in regard to potential impact to human health and the environment.

5. In 2005, another investigation program was developed by TCC for the NYSDEC.

   The additional investigations were specified in the 2005 Scope of Work and were primarily completed in August 2005. The work was completed by representatives of Conestoga-Rovers & Associates (CRA, now GHD) with oversight and input being provided in the field by Edward Hampston of the NYSDEC. The input of Mr. Hampston was critical in the selection of the samples that were to be collected and submitted for chemical analysis and for the selection of invasive activity locations such as the test pits.

   The 2005 investigation activities were focused on the three former disposal areas (Sites 108, 109, and 110). For the purpose of this report, only those activities associated with Site 108 have been included. The 2005 investigation included:

   - The excavation of an additional three test pits into the fill material and the collection of one sample of the fill from each test pit for chemical analysis.
   - Surface soil samples from the upper 2 inches of the soil horizon were collected from five locations selected from across Site 108 and analyzed for chemical constituents.
   - One new groundwater monitoring well (MW-18 D) was installed into the deeper portion of the groundwater flow regime adjacent to historic well MW-18 and groundwater samples were collected and analyzed.
   - Samples of the sediment in the Niagara River were collected from the upper 4 inches of material at three locations. The first location selected was located approximately 40 feet from the outfall of the drainage ditch that traverses Site 108. The other two samples were collected from points 400 feet and 650 feet upstream of the outfall location. The sampling locations were about 15 feet from the shoreline.

6. In 2009, a sediment sampling program was developed to further investigate the quality of the sediment in the embayment of the Niagara River immediately adjacent to the outfall of the on-Site ditch that traverses Site 108. Sediment samples were collected from 11 locations within the embayment. Some of the sampling locations were sampled at multiple depths to provide insight into the chemical concentrations in the sediment with depth.

Based on the data from these investigations, and as requested by the NYSDEC, CRA, on behalf of TCC, prepared a Focused Feasibility Study to assess the following environmental conditions that had been identified as needing to be addressed:

- The sediment in the embayment of the Niagara River, where the Site ditch discharges, contains elevated concentrations of Semi-Volatile Organic Compounds (SVOCs).
- A mechanism was identified as being needed to reduce the potential for sediment from Site 108 from re-depositing in the embayment area.
- A layer of coal/coke/breeze material is exposed on the ground surface adjacent to the Niagara River.
- A pile of coal/coke/breeze material is present on the ground surface adjacent to the Niagara River.

7. Based on further discussions with NYSDEC on the Focused Feasibility Study for Site 108, concurrence was reached on the need to revise the study, which was included in the 2016 Order on Consent and Administrative Settlement (Index # B9-85-02-77B). Following the resubmittal of the Focused Feasibility Study in January 2016, the NYSDEC requested that additional data be collected to support the remedial assessment for Site 108 to ensure that all factors have been properly considered in the assessment. The additional data that was requested includes:

   - The soil conditions around the former tank farm.
   - The contents of the three on-Site aboveground storage tanks.
   - The sediment quality in the upstream area of the Niagara River embayment, as well as in the middle of the embayment.
   - The sediment quality in the on-Site ditch.
   - The soil quality beneath the coal / coke / breeze area near the Niagara River that is planned for removal.
   - The soil quality on and below the surface of the Site.

   The specifics of the additional sampling program were provided in the Confirmation Investigation Work Plan (by GHD – August 18, 2016).

This report provides a compilation of the applicable historical data for Site 108 supplemented with the information collected in 2016. The results are presented in the following sections of this report. It is noted that the NYSDEC actively participated in the 2016 confirmation investigation by being involved in the selection of sample locations and observing the collection of the samples.

2. On-Site Soil

2.1 Surface Soils

In addition to the five surface soil samples (SS-1 through SS-5) collected from Site 108 in 2005, 15 additional surface soil samples (SS-1 through SS-15) were collected between August 30 and September 12 2016. The following provides a summary of the surface soil sampling events.

2005

The 2005 samples were analyzed for VOCs, SVOCs, metals, and cyanide. The 2005 surface soil sampling results are presented in Table 2.1. The sample results for SS-1 through SS-5 were below both the industrial and restricted residential SCOs for all VOC compounds.

A total of seven SVOC parameters were detected at concentrations exceeding either the industrial or restricted residential SCOs, or both, in samples SS-1 through SS-5. The exceeded SVOC parameters were:

- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Chrysene
- Dibenz(a,h)anthracene
- Indeno(1,2,3-cd)pyrene

It was noted that the 2 samples from 2005 with the highest total SVOCs were samples SS-1 (567 ppm) and SS-2 (120 ppm). In both of these samples, coal/coke/breeze was observed to be present in the sample collected and likely skewed the results. The locations of the 2005 sampling results for total SVOCs are presented in Figure 2.1. There were no exceedances of either the industrial or restricted residential SCOs for metals in any of the 2005 samples.

2016

The 15 surface soil samples collected between August 30 and September 12, 2016 were taken at the locations where Test Pits 1 through 15 were planned to be excavated, consistent with the Work Plan. The samples were collected from the upper two inches of soil. All of the samples were analyzed for SVOCs, total organic carbon (TOC) and metals. In addition, two of the samples (TP-1 and TP-12) were also analyzed for VOCs, pesticides, total cyanide, and PCBs.

In the two samples analyzed for VOCs, there were only two compounds tentatively detected at one ppb at TP-1 and no compounds detected at TP-12. Both samples were non-detect for PCBs. For the pesticide samples, only three compounds were tentatively detected at TP-1 and only one compound at TP-12. None of the tentatively detected compounds exceeded New York's protection of groundwater, or commercial or industrial SCOs. The total cyanide concentrations at both

locations were 1 ppm and similarly do not exceed any New York criteria. Consequently, VOCs, PCBs, pesticides, and cyanide are not of concern for the surface soils.

In the 15 surface soil samples collected, only two metal compounds exceeded the industrial SCOs and those occurred in: only 1 of the 15 samples for cadmium (72 ppm vs the criteria of 60 ppm at TP-12), and in only 4 of the 15 samples for arsenic (with the highest concentration being 28 ppm : vs : the criteria of 16 ppm). The presence of arsenic or cadmium at these concentrations is not inconsistent with what would typically be found on an industrial property in New York. These marginal exceedances, coupled with all of the results that meet the industrial SCO, show that metals are not of concern in the surface soil.

SVOCs were present in the surface soils at low concentrations over the majority of the Site, with total SVOC concentrations being less than 100 ppm in 11 of the 15 samples. The highest total SVOC concentration was 2,803 ppm at TP-1 and the next highest was 561 ppm at TP-15. It is noted that in three of the four test pit surface samples with total SVOC concentrations exceeding 100 ppm (including TP 1 and TP 15), the stratigraphic logs for these samples show that there was coal/coke/breeze in the sampled layer. Consequently, it is not unexpected that these samples have the highest total SVOC concentrations in the on Site surface soil.

All four of the surface soil samples that exceeded 100 ppm were located in the northwestern portion of the Site, where coal/coke/breeze is evident on the ground surface. Similarly, samples SS-1 and SS-2 from the 2005 sampling event are also in areas where coal/coke/breeze is evident on the ground surface. This correlation between higher SVOC concentrations and coal/coke/breeze observations indicates that removal of the coal/coke/breeze from the ground surface will rectify the SVOC concentration concern in these areas.

The total SVOC concentrations in the surface soils from the 2016 investigation are presented in Figure 2.1. All of the analytical results for the 2016 test pit surface soil samples are presented on Table 2.2.

Based on the results of the surface soil investigation, it appears that there are a few locations where elevated SVOCs are present in the surface soil. However, in almost every case where an elevated SVOC concentration was identified, the presence of coal or coke was also identified. Coal and coke are the main products that have been handled at the facility historically, and are not hazardous materials.

2.2 Subsurface Soils

In addition to the three subsurface soil samples taken from the test pit investigation in 2005 (TP-1 through TP-3), and a composite subsurface soil sample collected from test pits TP-Q/TP-S in 1989, 14 additional subsurface soil samples were collected from the locations of test pits (TP-1 through TP-15) on September 8 and 9, 2016.

The following provides a summary of the subsurface soil sampling events.

1989

The 1989 subsurface soil sample was collected as a composite from two test pits (TP-Q and TP-S). This sample was collected in duplicate so two sets of results were available. The samples were

analyzed for Target Compound List VOCs and Base Neutral Acids, Target Analyte Metals, cyanide, oil & grease, hexavalent chromium, and TCLP VOCs, SVOCs, and Metals. The analytical results for these duplicate samples are presented in Table 2.3.

A limited number of VOCs were present in both of the soil samples. The total SVOC concentrations for the duplicate samples were 98 and 177 ppm (average of 138 ppm), well below the New York criteria of 500 ppm. No metals (including cyanide) exceeding the New York Industrial SCOs were identified.

2005

The three samples collected from the 2005 test pits TP-1, TP-2, and TP-3 were analyzed for VOCs, SVOCs, metals (including cyanide), and Total Petroleum Hydrocarbons. The locations of the three 2005 test pits are shown on Figure 2.1.

While there was some BTEX present in the sample from TP-2, no VOC exceeded the Industrial SCOs. For SVOCs, the concentrations were low; all less than 35 ppm for total SVOCs. For metals, only arsenic exceeded the Industrial SCO of 16 ppm, and that only occurred in one of the three samples. The highest arsenic concentration was only 21 ppm. The presence of arsenic at this concentration is not inconsistent with what would typically be found on an industrial property in New York.

The analytical results for the three 2005 subsurface soil samples are presented in Table 2.4.

2016

The 2016 subsurface soil samples were collected from the 15 test trenches that were excavated as part of the confirmation investigation. The locations of the 15 test trenches (TP-1 through TP-15) are presented in Figure 2.1, and the stratigraphic logs of the materials encountered are presented in Appendix A.

The 2016 sample intervals were selected in conjunction with NYSDEC field personnel present at the site. One sample was selected from each test pit except from TP-2, where the presence of slag prevented penetration of the backhoe into the subsurface layers.

In general, the test trenches:

- Were on the order of 10 feet long and 3 feet wide.
- All reached to a depth that encountered the native soil underlying the fill. The one exception to this was TP-2. At TP-2, six attempts were made to excavate to depth but at each location, slag was encountered near the 18-inch depth and could not be penetrated. The NYSDEC has requested in an October 20, 2016 letter that further evaluation of the slag and the possible relation to radioactive material on the Site be performed. This will be completed outside the scope of this Work Plan.
- The native soil underlying the fill material was typically sand on the western half of the Site, and clay on the eastern half of the Site.

- Typically encountered a couple of feet of soil fill (up to 5 feet thick) overlying regular construction debris. The debris typically included wood, bricks, pipes, and plastic. No drums were encountered. TP-11A was all brick material.
- Based on their location and the materials encountered, it is suspected that TP-13 and TP-14 may have been excavated into the old Erie Barge Canal. The fill material in these test trenches included logs, timber, and stone that were likely placed when the canal was abandoned.
- Odors were present in a few of the test trenches (TP-2, TP-4, TP-7, TP-10, TP-16, TP-17, TP-18, TP-19, TP-B-6, and TP-B-6a)
- A surface soil sample and a subsurface soil sample were collected at each test trench location.

The 14 subsurface soil samples collected in the test trench component of the 2016 investigation were all analyzed for metals and SVOCs. In addition, two samples (TP-4 and TP-10) were also analyzed for VOCs, pesticides, PCBs, and cyanide. The analytical results from the 2016 subsurface soil investigation are presented in Table 2.5.

In the two samples tested for PCBs, there were no PCBs detected and only trace levels of a couple of pesticides. Cyanide was present, but below the Industrial SCO. So there are no concerns about PCBs, pesticides, or cyanide in the subsurface soils from the test pits. In TP-4, VOC BTEX compounds were present (totaling approximately 50 ppm), but do not exceed the Industrial SCOs. Only trace levels of VOCs were present in TP-10. VOCs have not been present in the groundwater samples that have historically been taken from Site 108, with the exception of a few compounds at trace levels.

For metals, the Industrial SCOs were only exceeded in 3 of the 14 test trench samples (TP-5, TP-8, and TP-9). Arsenic exceeded the Industrial SCO of 16 ppm in each of these three samples but the highest concentration was only 40 ppm. In addition to the arsenic exceedances, manganese exceeded the Industrial SCO in one sample (TP-5; 12,000 ppm: vs: the standard of 10,000 ppm) and mercury exceeded the Industrial SCO in one sample (TP-8; 6.5 ppm: vs: the standard of 5.7 ppm). The presence of arsenic, manganese, and mercury at these low concentrations is not inconsistent with what would typically be found on an industrial property in New York. Consequently, based on these few and minimal exceedances of the Industrial SCOs, the subsurface metals are not of concern.

With regard to SVOCs, the total SVOC concentration was less than 500 ppm in all but 3 of the 14 test pit subsurface soil samples, as can be seen on Figure 2.1. In fact, 10 of the 14 test pit subsurface soil samples had total SVOC concentrations of less than 100 ppm. The samples that exceeded 100 ppm of total SVOCs are:

- TP-4 10,657 ppm
- TP-7 7,632 ppm
- TP-10 3,000 ppm
- TP-8 313 ppm

In the samples taken from TP-7 and TP-10, evidence of tar was found in the soil horizon that was sampled. At TP-4, no tar or coal was observed, but ash was present.

In addition to the 14 subsurface soil samples collected in conjunction with the test pits, there were also eight subsurface soil samples collected in test pits B-1 through B-6, which were installed to investigate the area around the bermed tank farm. Originally, it was planned to excavate these test pits within the bermed area. However, the identified presence of tar within the bermed area resulted in the relocation of these test pits to the perimeter area immediately outside of the berms, which was completed with NYSDEC concurrence.

Four additional subsurface soil samples were collected from beneath the known coal / coke / breeze area adjacent to the river in test pits TP-16 through TP-19. The locations and total SVOC concentrations from the samples collected at these locations are also presented on Figure 2.1. The results of the berm area investigation are presented in Section 5.0. The results of the coal/coke/breeze investigation are presented in Section 6.0.

Based on the results of the subsurface soil investigation performed as part of the test trench investigation, it appears that there are a few locations where elevated SVOCs are present in the subsurface soil at concentrations that exceed the Industrial SCO of 500 ppm for total PAHs. However, in almost every case where an elevated SVOC concentration was identified, the presence of coal, coke, or tar was also identified. Coal and coke are the main products that have been handled at the facility historically, and are not hazardous materials. It is recognized that coal tar is a listed hazardous waste.

3. Niagara River Embayment Sediment

During previous studies of the sediment in the Niagara River, it was identified that there is an area in the shallow embayment adjacent to the on-Site ditch's outfall discharge point where the sediment has been impacted with SVOCs. Beyond the limits of the embayment, the velocity of the river flow becomes much higher, making it impossible for sediment to settle and accumulate. Consequently, the only location where sediment accumulation is possible is on the sheltered water of the embayment where a shelf of sediment exists.

Sediment samples have been collected from the River on at least four occasions and analyzed for SVOCs. The first date for which locations are known was in July 1993. All of the sample locations were in close proximity to the on-Site ditch's outfall into the Niagara River. Four samples were collected for which SVOC data are available (see Table 2.6). The total SVOC concentrations of the four samples collected are as follows:

- SED-01 53 ppm
- SED-02 105 ppm
- SED-03 783 ppm
- SED-04 2,388 ppm

The second set of samples was collected by CRA in 2005. Samples were collected at three locations; one near the outfall and two further upstream. The locations of these three sample points are shown on Figure 2.2. The total SVOC concentrations of the three samples collected are presented in Table 2.7 and are as follows:

- RIVER-1 293 ppm
- RIVER-2 4 ppm
- RIVER -3 9 ppm

In 2009, CRA collected samples from 11 locations in the embayment, spreading outward from the ditch's outfall. The samples were collected from the surface at each location and at multiple depths at five of the locations. The locations are presented in Figure 2.2 and the analytical results are presented in Table 2.8. Each sample was analyzed for SVOCs. The total SVOC concentrations are also plotted on Figure 2.2.

Based on the 2009 investigation results, it was determined that the most heavily impacted sediments were located closest to shore and in the upper 2.5 feet of sediment. Sediments from the three sample locations defining the heavily impacted area (sample locations SP-3, SP-8, and SP-10) had total SVOC concentrations ranging from 12 to 3,868 ppm. The surface sediments in the area immediately to the south of the heavily impacted area of the embayment also had elevated SVOC concentrations. The surface sediment in this adjacent area (encompassed by sample locations SP-6, SP-7, SP-9 and SP-11) had total SVOC concentrations ranging from 445 to 3,069 ppm.

Previous discussions of the results of the 2009 embayment survey with the NYSDEC concluded that the expected source of the SVOCs in the embayment was related to the presence of coal/coke fines, similar to the conditions observed on Site 108 itself. Based on these data, a remediation plan to remove the sediments with elevated SVOC concentrations from the embayment was developed in conjunction with the NYSDEC at that time.

In 2016, the NYSDEC requested additional delineation of the SVOC concentrations in the embayment and a sampling plan was developed and included in the Work Plan. The sampling was performed on September 21, 2016, and included the collection of sediment samples from eight locations, with samples being collected at three depth intervals at each location. The selected sampling depths were 0 to 0.5', 1.5 to 2.0' and 2.5 to 3.0'. Each sample was analyzed for SVOCs, metals, and TOC. In addition, three of the samples (SR-2 at 0 to 0.5', SR-7 at 0 to 0.5', and SR-8 at 1.5 to 2') were also analyzed for pesticides, PCBs, VOCs, and cyanide. The analytical results are presented in Table 2.9. The stratigraphic logs for the sediments encountered at each location are presented in Appendix B.

The results of the analyses showed that:

- PCBs were non-detect, except for trace levels of tentatively identified PCBs (combined total less than 0.6 ppm) at two of the sample locations. The samples all meet the Class A sediment criteria.
- All of the VOC samples meet the Class A sediment criteria, with the exception of one exceedance for toluene in one sample (at SR-7).
- All of the pesticide samples meet the Class A sediment criteria.
- Cyanide was not detected in two of the three samples, and was only tentatively identified to be present at 1 ppm in the third sample. The samples all meet the Class A sediment criteria.

- 16 of the 24 samples meet the Class A sediment criteria for metals. Of the eight remaining samples:
  - Four did not meet the Class C sediment criteria for silver, although the highest concentration was only 10 ppm.
  - One did not meet the Class C sediment criteria for lead.
  - Two did not meet the Class C sediment criteria for zinc.
  - All of the exceedances of the Class C sediment criteria occurred at sample locations SR-7 and SR-8 with the exception of one at the shallow interval of SR-6.
  - These low level metal detections are not inconsistent with what would typically be found on an industrial property in New York.
- The SVOC concentrations from the 2016 sampling event are consistent with the results of the 2009 survey.
  - Sediment samples at the southern end of the embayment (furthest from the outfall – SR-1 and SR-2) were unaffected by SVOCs.
  - The sediment samples closest to the outfall had high total SVOC concentration (554 ppm at SR-6 and 167 ppm at SR-7). Only the 0 to 0.5' intervals at these two locations were elevated.
  - The sediment samples in the middle section of the embayment were from locations that had been impacted by SVOCs in the shallow zone (SR-3 and SR-4).
  - Seven of the 24 samples exceed the Class C sediment criteria. They are as follows:

0 to 0.5'	**1.5 to 2'**	**2.5 to 3'**
SR-3	SR-7	SR-4
SR-4		
SR-6		
SR-7		
SR-8		

These results confirm that the sediment closest to shore and the outfall is impacted with SVOCs, and to a different depth than the mid-section of the embayment, where only the upper layer of sediment (0 to 0.5') is impacted.

4. On-Site Ditch Sediment

The on-Site ditch has been the subject of a number of discussions with the NYSDEC over the years. In 1989, two sediment samples were collected from the on-Site ditch (SW-5 and SW-6). The samples were analyzed for VOCs, SVOCs, cyanide, hexavalent chromium, and oil & grease. The

analytical results of this sampling event are presented in Table 2.10, and the locations of the 2 sampling stations are shown on Figure 2.3.

Based on the 1989 sampling results, it was identified that SVOCs were present in the ditch sediment at concentrations ranging between 18 and 594 ppm total SVOCs. These results were discussed with the NYSDEC and a Site reconnaissance session was specifically set up with members of the NYSDEC's Fish & Wildlife Group on January 26, 2011. The purpose of the Site inspection was to observe the conditions along the ditch that traverses Site 108 to assess what impact any possible remediation along or within the ditch would have on the current setting. The inspection identified the following regarding the ditch and the adjacent Site environment:

1. The volume of flow in the ditch is substantial, and is, and has been, primarily cooling water discharge from TCC's operating facility. Surface water flow is the other prominent contributor to flow in the ditch, albeit intermittently, as dictated by the weather conditions. Some shallow groundwater may also be discharging to the ditch.
2. The water flow in the ditch was clear during the inspection, and has been clear during most other inspections, with the exception of inspections occurring immediately following precipitation events, where the water becomes turbid. Minimal scouring in the ditch occurs. The majority of the ditch base and submerged sidewalls are comprised of hard surface materials, such as rock, brick, slag, and logs. The higher reaches of the sidewalls are soil covered and well vegetated. This is typical in those reaches of the ditch where the ditch is more defined and the velocity of flow is faster. Nonetheless, there are some portions of the ditch where the flow is more quiescent (in particular the ponded areas) and the ditch surfaces in these areas are soil covered.
3. The natural habitat of the ditch and surrounding area is impressive. It is a unique stream-like setting containing varied species of vegetation along the ditch; lots of logs and branches within the flow path, and a very attractive setting for wildlife. It was noted that this is one of the very few decent environmental settings along a waterway entering the upper Niagara River; especially this close to the Niagara River.
4. Lots of wildlife was evident along the ditch. Beavers (including one beaver habitat), otters, blue heron, and ducks were seen during a Site walk through. Evidence of mice, mink, rabbit, and other animals were noted by their tracks, which were present in the snow.

Based upon this Site inspection, and subsequent discussions concerning remedial options, the parties discussed how:

1. The existing natural setting in and along the ditch is vibrant and well suited to the Site environment.
2. Any attempt to line the existing ditch base and sidewalls will have a detrimental impact on the current natural setting. Expectations are that it would take several decades for the environmental setting to attain the same value as currently exists.
3. Since the only environmental concern is the presence of slightly elevated SVOCs in the ditch sediment (if it were to become mobile), minimal impact or risk currently exists.
4. The majority of the ditch is fast flowing, hard surfaced, and has minimal sediment present

In 2016, the NYSDEC requested that additional sampling be performed in the ditch to document the current conditions so that a further assessment of the ditch can be completed. The sampling program included the collection of sediment samples from 8 locations along the ditch. Five of the sampling locations are within the wet / ponded areas and the remaining three samples are located in the ditch itself. At each location, a sample was collected from the upper 0 to 0.5' interval and from 1 to 1.5'. Each sample was analyzed for metals, SVOCs, and TOC. In addition, two of the samples (SD-4 at 0 to 0.5' and SD-8 at 1 to 1.5') were also analyzed for pesticides, PCBs, VOCs, and cyanide. The analytical results are presented in Table 2.11. The total SVOC concentrations are plotted on Figure 2.3 and the stratigraphic logs of the sediments encountered are presented in Appendix C.

The results of the analyses showed that:

- PCBs were non-detect in both samples.
- VOCs were almost all non-detect. Only four compounds were detected; all below Class A sediment criteria.
- Pesticides were almost all non-detect. Only three compounds were detected; all below Class A sediment criteria.
- Cyanide was only tentatively identified to be present in one of the samples and only at 1 ppm. The samples all meet the Class A sediment criteria.
- Metals were commonly present in the sediment. Although most of the concentrations are not that high, they do exceed the Class C sediment criteria in a number of cases. Metals are commonly found on industrial properties.
- The total SVOC concentrations from the 2016 sampling event range from 15 to 2,458 ppm at seven of the eight sampling locations. At the eighth sampling location (SD-2), tar was present and the total SVOC concentrations increased accordingly (to 71,510 ppm).

Even with the presence of slightly elevated metals and SVOCs present, it still appears to be environmentally beneficial to maintain the natural ecological setting of the ditch in its current condition than to destroy it to remove the sediment. Similar to prior discussions with NYSDEC, in the circumstance where remediation were to take place in the ditch, it would be more valuable to be in the form of a mechanism to reduce potential future sediment discharge into the Niagara River rather than to remove the metals and SVOC-impacted sediment that presently exists. This possibility will be further evaluated in the Final Feasibility Study.

5. Tank Farm Investigation

It is planned to demolish the existing tank farm. In order to gain an understanding of the scope of work that will be involved to remove these tanks, an investigation of the tanks and the bermed area around the tanks was developed in the Work Plan and implemented as part of the 2016 Site investigation. The results of the September 2016 investigation of the tank farm are presented herein.

Tanks

The first component of the tank farm assessment involved an inspection of the tanks and their contents. The field observations made on September 1, 2016 are presented in Appendix D. The observations are summarized as follows:

East Tank

- The east tank is 45 feet in diameter and 36 feet tall.
- The east tank was in the best condition of the three tanks.
- There are some limited pinholes that were identified in the walls of the tank.
- There is approximately 2 feet of tar in the bottom of the tank, and it is covered with a thin layer of water.

Center Tank

- The center tank is 45 feet in diameter and 36 feet tall.
- There is a large hole (12' x 12') in the top of the tank.
- The tank contains approximately 9 feet of sticky tar, with approximately 2 feet of water overlaying it.

West Tank

- The west tank is 45 feet in diameter and 9 feet tall.
- There is a large hole in the south side of the tank.
- The top of the west tank is corroded and has collapsed inward and is resting on approximately 4 to 5 feet of tar present in the bottom of the tank.
- The tar is hard in some locations and soft in others.

All Tanks

- All of the tanks are welded steel construction, on a concrete base. It is not known if the tanks have a steel bottom.
- Dried tar was noted to be present beneath some of the tank appurtenances that protrude through the sidewalls of the tanks.
- A sample of the tar from each tank was collected and analyzed. The analytical results are presented in Table 2.12. As expected, the tar contains high SVOC concentrations with the expected SVOCs (naphthalene, benzo compounds, pyrene, fluoranthene, chrysene, etc.) being present. The concentrations in the middle tank were lower than the other two, but all the same compounds were present.
- Based on the analyses of the tar, the material is consistent with the type of tar-like material generated during the coke-making process, and therefore qualifies for reuse and recycling in plant operations.

Bermed Area

In addition to inspecting inside the tanks, the area within the berms surrounding the tanks was also inspected. The observations made during the inspection are presented in Appendix D. The observations are summarized as follows:

- There is tar present in most areas within the bermed areas.
- In some locations, the tar is exposed right at the surface, while in other areas, there is an overlying layer of moss or sediment.
- The thickness of the soft tar layer within the berms is up to 16 inches.
- Three samples of the tar were collected from within the berm and analyzed for SVOCs. The analytical results are presented in Table 2.12. The results matched the SVOC concentrations found in the tanks. Based on these analyses, is consistent with the type of tar-like material generated during the coke-making process, and therefore qualifies for reuse and recycling in plant operations.
- Due to the presence of the tar, it was decided not to proceed with the planned test pits inside the bermed area, with NYSDEC concurrence. Rather, it was decided to excavate some test pits outside the bermed area to see if tar was present outside the berm.
- Due to the field decision not to penetrate through the tar layer in the bermed area, it was not possible to determine the full vertical depth to which the underlying soils may have been impacted by the tar. That determination will have to be made after the tar is removed.

Bermed Area Test Pits

A total of six test pits were excavated outside the bermed area (B-1 through B-6) to determine the soil conditions around the former tank farm. The locations of the test pits are shown on Figure 2.1. The stratigraphy of the material encountered at each test pit excavation is presented in Appendix D.

As was previously mentioned, these test pits were relocated outside of the bermed area with NYSDEC concurrence, due to the presence of tar within the bermed area. The material removed during the test pit program was carefully observed during field activities. There was no tar present in five of the six test pits, indicating that the berm has performed as designed to control releases from the tanks. Tar was found in test pit B-6, and in two follow-up excavations (B-6A and B-6B), which were excavated further to the south of the eastern tank. Tar was also identified in the two follow-up excavations. However, the general consensus of the field technicians is that the tar in B-6 was not the same as the tar within the bermed area, and therefore, is likely not related or sourced from the tanks. In addition to the tar found at B-6, tar was identified to be present in a few isolated pockets across the Site during the 2016 investigation and, similarly, would not be expected to be related to the operation of the tank farm, but rather, historical incidental releases when the tank farm was in operation.

A total of eight subsurface soil samples were collected from the test pits on September 8 and 9, 2016 and analyzed for SVOCs. Two of these samples (taken from B-6 at depths of 4 to 5’ and 6 to 7’) were also analyzed for metals, PCBs, pesticides, VOCs, cyanide, and TOC. The analytical results are presented in Table 2.4. The total SVOC concentrations are also shown on Figure 2.1.

The results of the analyses showed that:

- PCBs were non-detect in both samples.
- VOCs (primarily BTEX compounds) were detected in the shallower sample at concentrations up to 210 ppm (for xylene), but all were below the Industrial SCOs. The VOCs in the deeper sample, taken only a foot deeper than the shallow sample, only had 0.1 ppm of total VOCs.
- Pesticides were almost all non-detect. Only two compounds were detected; both at concentrations less than 1 ppb, and all below the Industrial SCOs.
- Cyanide was only present in one of the samples and only at 2 ppm. The samples both meet the Industrial SCOs.
- The metals in the samples were present at relatively low concentrations, and none exceeded the Industrial SCOs.
- The total SVOC concentrations in five of the eight samples did not exceed the Industrial SCO of 500 ppm. The three samples that did exceed the Industrial SCO had total PAH and SVOC concentrations of 2,026, 2,400, and 21,004 ppm. Tar was present in one of those samples, and coal / coke pieces were present in the other two samples. Consequently, it is not unexpected that these samples had high SVOC concentrations, and are more representative of the related material located within the sampling area.

It was also noted that there was a significant difference in the two samples collected from the B-6 location. One was collected from a depth of 4 to 5 feet, and the second from 6 to 7 feet. The shallower sample contained coke and had elevated SVOC concentrations (21,004 ppm) while the deeper sample, which was collected just a short distance deeper in the test pit had no evidence of coal or coke and only had a total SVOC concentration of 2 ppm.

Based on the results of the tank investigation performed, it appears that there is limited tar in pockets outside the bermed area. This material appears consistent with the type of tar-like material generated during the coke-making process, and therefore qualifies for reuse and recycling in plant operations. While it is not known the extent to which the soil within the berm beneath the tar has been impacted, it does not appear that there was any lateral migration of tar beyond the berms. Consequently, it appears that the amount of impacted soil in the tank area will be limited.

6. Coal/Coke/Breeze Area Investigation

On a portion of the Site near the Niagara River, there is an area where coal/coke/breeze is present, exposed on the ground surface. The presence of this material has been discussed with the NYSDEC on a number of occasions, with the consensus being that this material should be removed to prevent it from entering the Niagara River. The 2016 investigation included excavating through the coal/coke/breeze to determine the thickness of this layer, and to determine the conditions of the soil/fill beneath the coal/coke/breeze.

Four test pits were excavated into the coal / coke / breeze area (TP-16 through TP-19) for this investigation. The stratigraphic logs for these test pits are presented in Appendix A. The primary observations made at the time of the excavations are as follows:

Test Pit #	Thickness of Coal/Coke/Breeze	Depth to Native Soil
TP-16	5’	14’
TP-17	4’	7’
TP-18	3’	9’
TP-19	5’	5’

- The layer of coal/coke/breeze looks to be well defined, so determining the limits of this material should be possible. The material appears to be relatively free of impurities, so it should be acceptable for reuse at the plant operations without concern of residual impact.
- Some of the coal/coke/breeze had a fuel oil or naphthalene odor. One area had a chemical odor.
    - A sample of the soil beneath the coal/coke/breeze material was collected from each test pit. The samples were analyzed for metals and SVOCs. The underlying soil beneath the coal / coke had no exceedances of any Industrial SCO for metal, with the exception of arsenic at one of the test pits (TP-16; 36 ppm vs an Industrial SCO of 16 ppm), which is not inconsistent with what would typically be found on an industrial property in New York. The total SVOC concentrations in three of the four subsurface soil samples were 100 ppm or less, with the fourth sample having a total SVOC concentration of 1,236 ppm, although this was at a depth of 14 feet below the ground surface. The analytical results for the coal/coke area investigation samples are presented in Table 2.5.

Based on the investigation of the coal/coke/breeze area, it was determined that the coal/coke layer is up to 5 feet thick, is relatively free of impurities, and can be readily delineated from the underlying soil. Consequently, this material should qualify for reuse in plant operations, as previously anticipated.

7. Summary of Findings

The 2016 confirmation investigation program was successfully completed in accordance with the specifics described in the Work Plan. The primary findings of the investigation are as follows:

- Based on the results of the surface soil investigation, it appears that there are a few locations (primarily on the northern and western side of the Site) where elevated SVOCs are present in the surface soil. However, in almost every case where an elevated SVOC concentration was identified, the presence of coal or coke was also identified. Coal and coke are the main products that have been handled at the facility historically, and are not hazardous materials. The presence of such materials on the Site can be adequately addressed through a Site Management Plan, which will establish the protocols to be utilized in the event that these materials are encountered in the future.

- Based on the results of the subsurface soil investigation, it appears that there are a few locations where elevated SVOCs are present in the subsurface soil at concentrations that exceed the Industrial SCO of 500 ppm for total SVOCs. However, in almost every case where an elevated SVOC concentration was identified, the presence of coal, coke, or tar was also identified. Coal and coke are the main products that have been handled at the facility historically, and are not hazardous materials. Coal tar, where present, is a listed hazardous waste. The presence of coal and coke on the Site can be adequately addressed through a Site Management Plan, which will establish the protocols to be utilized in the event that these materials are encountered in the future.
- The results of the embayment sediment investigation are consistent with the 2009 survey results, and confirm that the sediment closest to shore and the outfall is impacted with SVOCs and to a greater depth than the mid-section of the embayment where only the upper layer of sediment (0 to 0.5') is impacted. Removal of the sediments with elevated SVOC concentrations would be appropriate, consistent with the activities previously discussed with NYSDEC personnel.
- The on-Site ditch sediment investigation has confirmed that there are sediments with elevated SVOC and metals concentrations. Even with the metals and SVOCs present, it is still believed to be environmentally better to maintain the natural ecological setting of the ditch in its current condition than to destroy it to remove the sediment. If remediation were to take place in the ditch, it would be more valuable to be in the form of a mechanism to reduce potential future sediment discharge into the Niagara River rather than to remove the metals and SVOC-impacted sediment that presently exists. Such possibilities will be evaluated in the Final Feasibility Study.
- Based on the results of the tank investigation performed, it appears that there is tar present within and around the tanks (within the bermed area) that qualifies for recycling in plant operations. While it is not known the extent to which the soil beneath the tar within the berm has been impacted, it does not appear that there was any lateral migration of tar beyond the berms. Consequently, it appears that the amount of impacted soil in the tank area will be limited.
- Based on the investigation of the coal/coke/breeze area, it was determined that the coal/coke layer is up to 5 feet thick, is relatively free of impurities, and can be readily delineated from the underlying soil. Consequently, this material should qualify for recycling at the Plant.

8. References

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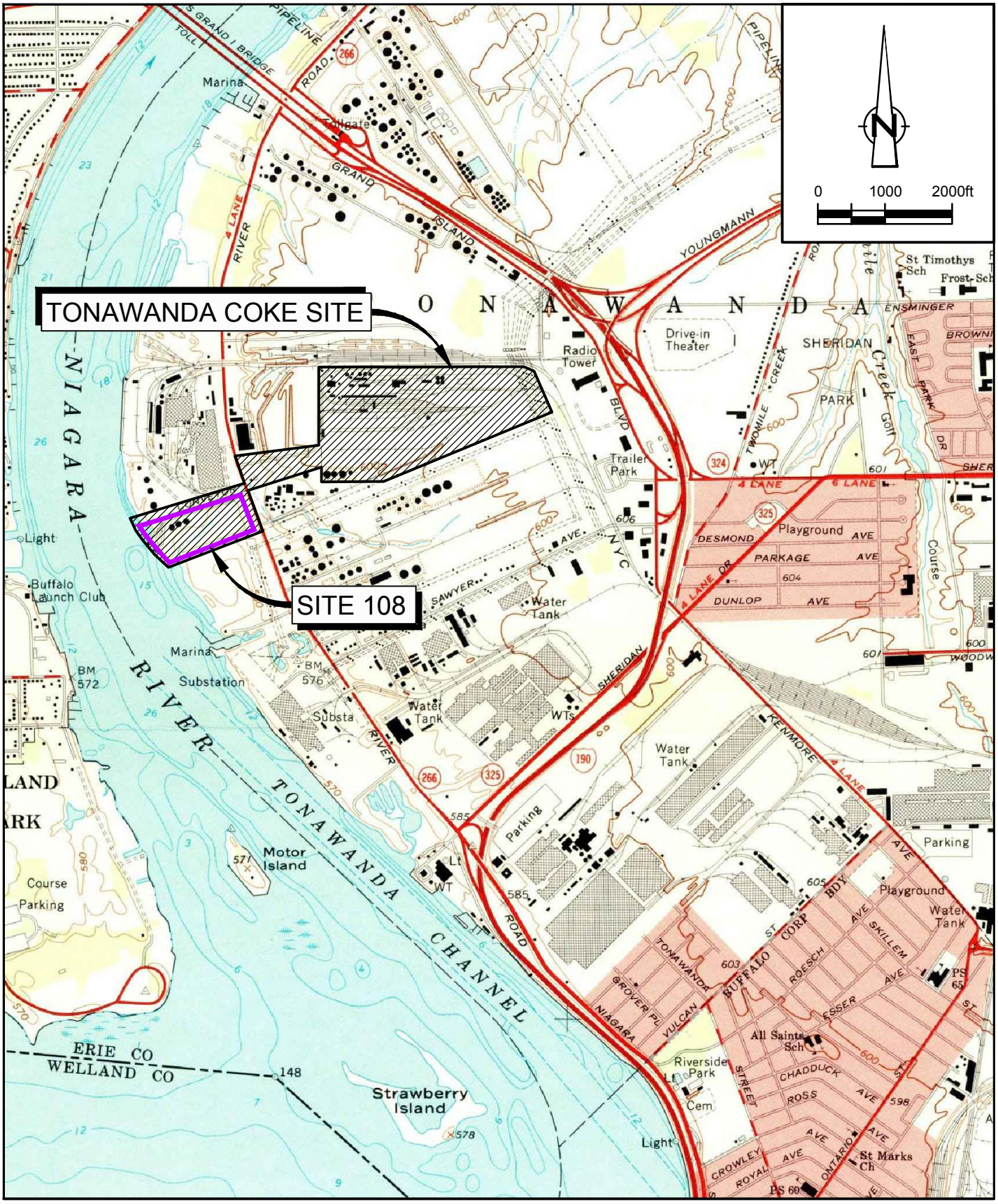


SOURCE: USGS QUADRANGLE MAP; BUFFALO NW, NEW YORK

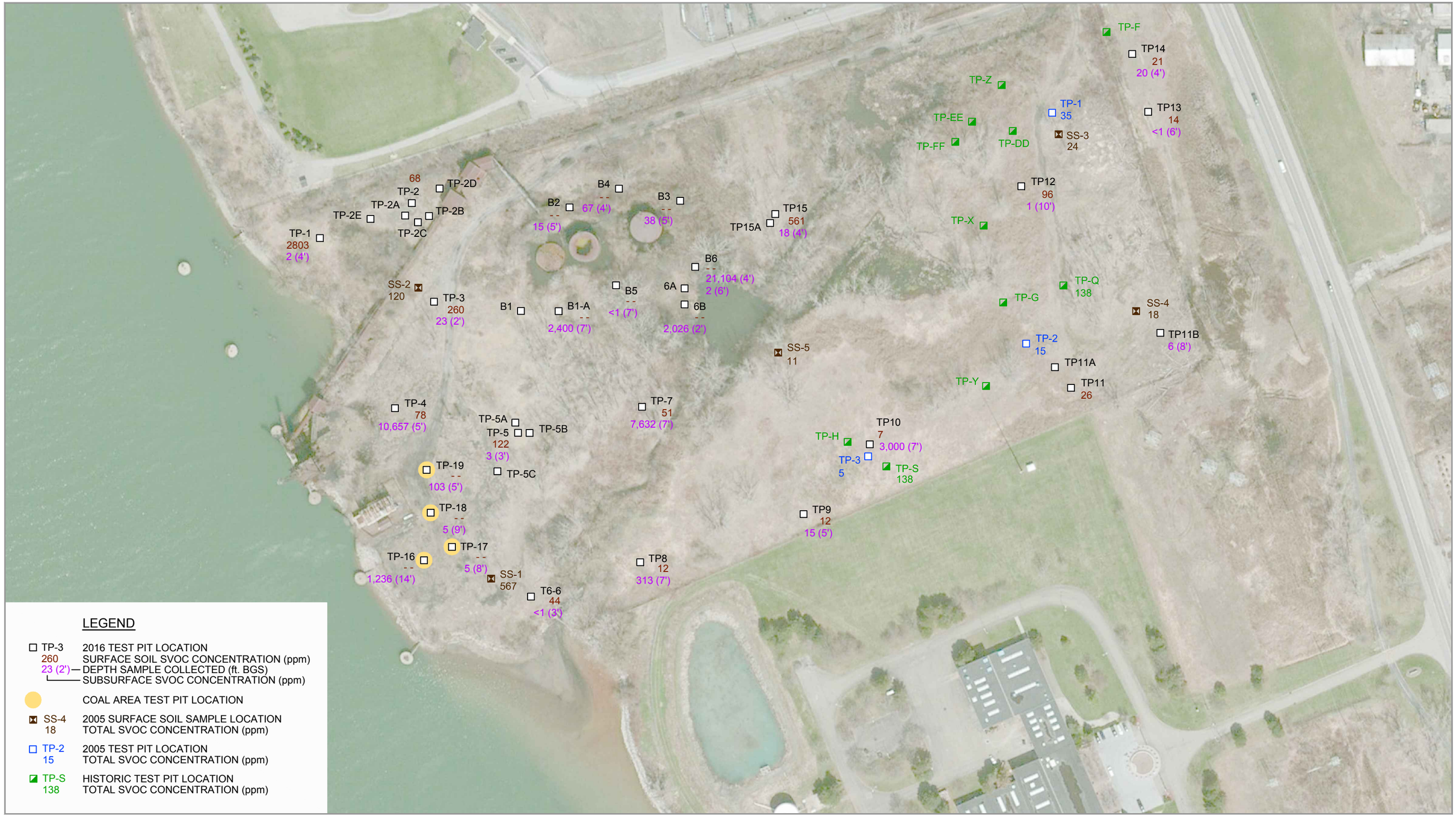
TONAWANDA COKE
TONAWANDA, NEW YORK
CONFIRMATION INVESTIGATION

02428-05
Oct 20, 2016

SITE LOCATION

FIGURE 1.1

CAD File: P:\drawings\02000s\02428\02428-reports\02428-05(023)\02428-05(023)GN\02428-05(023)GN-WA006.dwg



LEGEND

- TP-3 / 260 / 23 (2') — 2016 TEST PIT LOCATION; SURFACE SOIL SVOC CONCENTRATION (ppm); DEPTH SAMPLE COLLECTED (ft. BGS); SUBSURFACE SVOC CONCENTRATION (ppm)
- COAL AREA TEST PIT LOCATION
- SS-4 / 18 — 2005 SURFACE SOIL SAMPLE LOCATION; TOTAL SVOC CONCENTRATION (ppm)
- TP-2 / 15 — 2005 TEST PIT LOCATION; TOTAL SVOC CONCENTRATION (ppm)
- TP-S / 138 — HISTORIC TEST PIT LOCATION; TOTAL SVOC CONCENTRATION (ppm)

0 50 150ft

TONAWANDA COKE
TONAWANDA, NEW YORK

SOIL SAMPLE RESULTS
SVOCs

02428-05
Mar 7, 2017

FIGURE 2.1

CAD File: P:\drawings\02000s\02428\02428-reports\02428-05(023)\02428-05(023)GN\02428-05(023)GN-WA004.dwg

LOCATED IN DITCH
ADJACENT TO MW6
APPROXIMATELY 1220 ft.

13
234
803
- -
- -

10
3,749
71
642
2

7
2,937
- -
- -
- -

1
280

SR-8
100/138
7
12

8
40
- -
- -
- -

SR-7
163
115
6

11
787
- -
- -
- -

3
12
2,568
771
- -

6
802
- -
- -
- -

SR-5
27
10
14

SR-6
570
24
2

9
431
- -
- -
- -

2
53
- -
- -
- -

4
87
169
6
9

5
49
16
9
- -

1
186
10
<1
2

SR-3
174
8
8

SR-4
247
25
60

SR-1
1
<1
<1

SR-2
9
<1
7

3
3
350'

2
2
100'

LEGEND

▲ 3	2005 SEDIMENT SAMPLE LOCATION
9	TOTAL PAH CONCENTRATION (ppm) 0-0.3 ft.BGS
5	2009 SEDIMENT SAMPLE LOCATION
51	TOTAL PAH CONCENTRATION (ppm) 0-0.3 ft.BGS
17	TOTAL PAH CONCENTRATION (ppm) 1-1.5 ft.BGS
10	TOTAL PAH CONCENTRATION (ppm) 2-2.5 ft.BGS
- -	TOTAL PAH CONCENTRATION (ppm) 3.5-4 ft.BGS
SR-4	2016 SEDIMENT SAMPLE LOCATION
248	TOTAL PAH CONCENTRATION (ppm) 0-0.5 ft.BGS
25	TOTAL PAH CONCENTRATION (ppm) 1.5-2 ft.BGS
60	TOTAL PAH CONCENTRATION (ppm) 2.5-3 ft.BGS

0 20 40ft

N

GHD

TONAWANDA COKE
TONAWANDA, NEW YORK

EMBAYMENT SEDIMENT SAMPLE RESULTS
TOTAL PAHs

02428-05
Oct 26, 2016

FIGURE 2.2

CAD File: P:\drawings\02000s\02428\02428-reports\02428-05(023)\02428-05(023)GN\02428-05(023)GN-WA002.dwg

0 50 150ft

LEGEND

SW-5 2005 ON-SITE DITCH SEDIMENT SAMPLE LOCATION
18 DITCH SEDIMENT TOTAL PAH CONCENTRATION (ppm) 0-0.5 ft. BGS

SD-3 2016 ON-SITE DITCH SEDIMENT SAMPLE LOCATION
175 DITCH SEDIMENT TOTAL PAH CONCENTRATION (ppm) 0-0.5 ft. BGS
199 DITCH SEDIMENT TOTAL PAH CONCENTRATION (ppm) 1-1.5 ft. BGS

GHD

TONAWANDA COKE
TONAWANDA, NEW YORK

ON-SITE DITCH SEDIMENT SAMPLE RESULTS
TOTAL PAHs

02428-05

Oct 26, 2016

FIGURE 2.3

CAD File: P:\drawings\02000s\02428\02428-reports\02428-05(023)\02428-05(023)GN\02428-05(023)GN-WA003.dwg

0 20 40ft

N

LEGEND

95,000 TOTAL PAH CONCENTRATION (ppm) - TAR IN BERM AREA

30,810 TOTAL PAH CONCENTRATION (ppm) - TAR INSIDE TANK

GHD

TONAWANDA COKE
TONAWANDA, NEW YORK

TANK SAMPLE RESULTS
TOTAL PAHs

02428-05

Oct 26, 2016

FIGURE 2.4

CAD File: P:\drawings\02000s\02428\02428-reports\02428-05(023)\02428-05(023)GN\02428-05(023)GN-WA004.dwg

Table 2.1

2005 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				SS-1	SS-2	SS-3	SS-4	SS-4	SS-5
Sample Date:		Restricted Use Soil Cleanup Objectives Protection of Public Health		8/17/2005	8/17/2005	8/17/2005	8/17/2005	8/17/2005	8/17/2005
								Duplicate	
Parameter	Units	Industrial	Res. Residential						
		a	b						
Volatiles									
1,1,1-Trichloroethane	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
1,1,2,2-Tetrachloroethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
1,1,2-Trichloroethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
1,1-Dichloroethane	µg/kg	480000	26000	8 U	10 U	7 U	2 J	1 J	2 J
1,1-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
1,2,4-Trichlorobenzene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
1,2-Dichlorobenzene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
1,2-Dichloroethane	µg/kg	60000	3100	8 U	10 U	7 U	7 U	6 U	7 U
1,2-Dichloropropane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
1,3-Dichlorobenzene	µg/kg	560000	49000	8 U	10 U	7 U	7 U	6 U	7 U
1,4-Dichlorobenzene	µg/kg	250000	13000	8 U	10 U	7 U	7 U	6 U	7 U
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	16 U	20 U	49	29	33	19
2-Hexanone	µg/kg	-	-	16 U	20 U	14 U	13 U	13 U	14 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	16 U	20 U	14 U	13 U	13 U	14 U
Acetone	µg/kg	1000000	100000	36	61	140	260	260	160
Benzene	µg/kg	89000	4800	5 J	10 U	2 J	8	8	2 J
Bromodichloromethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Bromoform	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Bromomethane (Methyl Bromide)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Carbon disulfide	µg/kg	-	-	8 U	10 U	2 J	7	7	5 J
Carbon tetrachloride	µg/kg	44000	2400	8 U	10 U	7 U	7 U	6 U	7 U
Chlorobenzene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
Chloroethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Chloroform (Trichloromethane)	µg/kg	700000	49000	8 U	10 U	7 U	7 U	6 U	7 U
Chloromethane (Methyl Chloride)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
cis-1,2-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
cis-1,3-Dichloropropene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Cyclohexane	µg/kg	-	-	8 U	10 U	14	10	9	7 U
Dibromochloromethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Ethylbenzene	µg/kg	780000	41000	8 U	10 U	7 U	7 U	6 U	7 U
Isopropylbenzene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Methyl acetate	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Methyl cyclohexane	µg/kg	-	-	8 U	10 U	22	15	13	7 U
Methyl Tert Butyl Ether	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
Methylene chloride	µg/kg	1000000	100000	14 U	16 U	13 U	12 U	12 U	13 U
Styrene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Tetrachloroethene	µg/kg	300000	19000	8 U	10 U	7 U	7 U	6 U	7 U
Toluene	µg/kg	1000000	100000	8 U	10 U	7 U	2 J	2 J	2 J
trans-1,2-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U
trans-1,3-Dichloropropene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Trichloroethene	µg/kg	400000	21000	8 U	10 U	7 U	7 U	6 U	7 U
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U
Vinyl chloride	µg/kg	27000	900	8 U	10 U	7 U	7 U	6 U	7 U
Xylene (total)	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	2 J	7 U
Total VOCs	µg/kg	-	-	41	61	229	333	335	190

Table 2.1

2005 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				SS-1	SS-2	SS-3	SS-4	SS-4	SS-5
Sample Date:		Restricted Use Soil Cleanup Objectives Protection of Public Health		8/17/2005	8/17/2005	8/17/2005	8/17/2005	8/17/2005	8/17/2005
								Duplicate	
Parameter	Units	Industrial a	Res. Residential b						
Semi-Volatiles									
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2,4,5-Trichlorophenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
2,4,6-Trichlorophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2,4-Dichlorophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2,4-Dimethylphenol	µg/kg	-	-	220 J	170 J	370 U	390 U	380 U	380 U
2,4-Dinitrophenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
2,4-Dinitrotoluene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2,6-Dinitrotoluene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2-Chloronaphthalene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2-Chlorophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
2-Methylnaphthalene	µg/kg	-	-	4600	8800	82 J	220 J	250 J	190 J
2-Methylphenol	µg/kg	1000000	100000	280 J	180 J	370 U	390 U	380 U	380 U
2-Nitroaniline	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
2-Nitrophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
3,3'-Dichlorobenzidine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
3-Nitroaniline	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
4-Bromophenyl phenyl ether	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
4-Chloro-3-methylphenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
4-Chloroaniline	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
4-Methylphenol	µg/kg	1000000	100000	680	320 J	370 U	130 J	160 J	170 J
4-Nitroaniline	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
4-Nitrophenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U
Acenaphthene	µg/kg	1000000	100000	570	450	130 J	120 J	110 J	80 J
Acenaphthylene	µg/kg	1000000	100000	12000	1700	360 J	320 J	260 J	380 U
Acetophenone	µg/kg	-	-	240 J	700	370 U	390 U	380 U	380 U
Anthracene	µg/kg	1000000	100000	16000	1800	380	500	370 J	200 J
Atrazine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Benzaldehyde	µg/kg	-	-	520	1200	370 U	390 U	380 U	530
Benzo(a)anthracene	µg/kg	11000	1000	50000[ab]	9400[b]	2200[b]	1500[b]	1100[b]	730
Benzo(a)pyrene	µg/kg	1100	1000	48000[ab]	6400 J[ab]	2200[ab]	1300[ab]	1000	780
Benzo(b)fluoranthene	µg/kg	11000	1000	68000[ab]	13000[ab]	2700[b]	1500[b]	1500[b]	1100[b]
Benzo(g,h,i)perylene	µg/kg	1000000	100000	20000	1700 J	1900	750	540	380
Benzo(k)fluoranthene	µg/kg	110000	3900	27000[b]	4600 J[b]	1100	870	500	600
Biphenyl	µg/kg	-	-	1000	1000	370 U	390 U	380 U	380 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
bis(2-Chloroethyl)ether	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	140 J	230 J	370 U	180 J	130 J	220 J
Butyl benzylphthalate	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Caprolactam	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Carbazole	µg/kg	-	-	3700	1100	200 J	160 J	160 J	120 J
Chrysene	µg/kg	110000	3900	52000[b]	10000[b]	2100	1300	1300	860
Dibenz(a,h)anthracene	µg/kg	1100	330	2900 J[ab]	720 J[b]	440[b]	230 J	180 J	100 J
Dibenzofuran	µg/kg	1000000	59000	3500	2700	96 J	180 J	160 J	120 J
Diethyl phthalate	µg/kg	-	-	3000	210 J	370 U	390 U	87 J	100 J
Dimethyl phthalate	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Di-n-butylphthalate	µg/kg	-	-	370 U	290 J	370 U	180 J	380 U	380 U
Di-n-octyl phthalate	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Fluoranthene	µg/kg	1000000	100000	90000	15000	3600	2700	1900	1400
Fluorene	µg/kg	1000000	100000	2500	850	130 J	210 J	170 J	82 J
Hexachlorobenzene	µg/kg	12000	1200	370 U	420 U	370 U	390 U	380 U	380 U
Hexachlorobutadiene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U

Table 2.1

2005 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				SS-1	SS-2	SS-3	SS-4	SS-4	SS-5
Sample Date:		Restricted Use Soil Cleanup Objectives Protection of Public Health		8/17/2005	8/17/2005	8/17/2005	8/17/2005	8/17/2005	8/17/2005
								Duplicate	
Parameter	Units	Industrial	Res. Residential						
		a	b						
Hexachlorocyclopentadiene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Hexachloroethane	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	20000[ab]	1600[b]	1600[b]	700[b]	550[b]	370 J
Isophorone	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Naphthalene	µg/kg	1000000	100000	25000	10000	170 J	460	620	260 J
Nitrobenzene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
N-Nitrosodiphenylamine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U
Pentachlorophenol	µg/kg	55000	6700	920 U	1100 U	930 U	990 U	970 U	960 U
Phenanthrene	µg/kg	1000000	100000	44000	14000	1800	2100	1500	970
Phenol	µg/kg	1000000	100000	480	170 J	370 U	390 U	380 U	380 U
Pyrene	µg/kg	1000000	100000	71000	12000	3100	2100	1500	1100
Total PAHs	ug/kg	500000	-	548970[a]	103220	23910	16660	13100	9012
Total SVOCs	µg/kg	-	-	567330	120290	24288	17710	14047	10462
Metals									
Aluminum	mg/kg	-	-	2620	2700	13600	8460	8980	9040
Antimony	mg/kg	-	-	0.37 U	0.42 U	0.37 U	0.61	1.1	0.68
Arsenic	mg/kg	16	16	5.1	5.3	7.0	7.7	7.4	12.1
Barium	mg/kg	10000	400	64.5	67.8	120	102	101	130
Beryllium	mg/kg	2700	72	1.9 U	2.2 U	1.9 U	2.0 U	2.0 U	2.0 U
Cadmium	mg/kg	60	4.3	0.28	0.43	0.10	2.6	2.8	4.3
Calcium	mg/kg	-	-	3800	5810	21600	24800	18700	14600
Chromium Total	mg/kg	-	-	19.2 J	152 J	20.6 J	52.8 J	62.9 J	84.6 J
Cobalt	mg/kg	-	-	4.2	3.2	10.8	6.4	6.3	6.6
Copper	mg/kg	10000	270	34.8 J	16.1 J	21.2 J	65.0 J	70.6 J	96.9 J
Iron	mg/kg	-	-	10800	8410	30200	29300	31100	40300
Lead	mg/kg	3900	400	44.2	207	22.0	145	154	226
Magnesium	mg/kg	-	-	889	998	8990	7210	4920	3550
Manganese	mg/kg	10000	2000	195	290	525	835	1190	963
Mercury	mg/kg	5.7	0.81	0.58 J	0.31 J	0.097 J	0.21 J	0.16 J	0.13 J
Nickel	mg/kg	10000	310	26.5	11.1	23.2	33.0	27.7	30.7
Potassium	mg/kg	-	-	625	460	2400	1550	1790	1320
Selenium	mg/kg	6800	180	1.5 J	1.2 J	0.68 J	0.64 U	0.62 U	0.62 U
Silver	mg/kg	6800	180	0.95	0.45 U	0.40 U	0.79	0.94	1.2
Sodium	mg/kg	-	-	76.5	78.3	128	169 J	1530 J	212
Thallium	mg/kg	-	-	1.0	0.80	2.7	2.6	3.2	4.1
Vanadium	mg/kg	-	-	94.0	9.8	29.6	85.3	44.3	16.3
Zinc	mg/kg	10000	10000	60.6	305	107	418	464	659
General Chemistry									
Cyanide (total)	mg/kg	10000	27	2.6 J	1.0 J	2.0 J	3.1 J	2.1 J	1.9 J
Percent Moisture	%	-	-	10.2	21.0	10.6	16.0	14.1	13.8
Total Petroleum Hydrocarbons	mg/kg	-	-	334	190	268	131	58.2	348

Notes:

J Estimated
R Rejected
U Not present at or above the associated value
UJ Estimated reporting limit

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-1 8/30/2016 0-0.1666667 ft bgs	TP-2 8/30/2016 0-0.1666667 ft bgs	TP-2 9/12/2016 0-0.1666667 ft bgs	TP-3 8/30/2016 0-0.1666667 ft bgs	TP-3 9/12/2016 0-0.1666667 ft bgs	TP-4 8/30/2016 0-0.1666667 ft bgs	TP-4 9/12/2016 0-0.1666667 ft bgs	TP-5 8/30/2016 0-0.1666667 ft bgs
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,1-Dichloroethane	-	270	240000	480000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	37 UJ	-	-	-	-	-	-	-
2-Hexanone	-	-	-	-	µg/kg	37 UJ	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	37 UJ	-	-	-	-	-	-	-
Acetone	2200	50	500000	1000000	µg/kg	37 UJ	-	-	-	-	-	-	-
Benzene	70000	60	44000	89000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Bromodichloromethane	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Bromoform	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Carbon disulfide	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Carbon tetrachloride	-	760	22000	44000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Chlorobenzene	40000	1100	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	µg/kg	1.1 J	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Ethylbenzene	-	1000	390000	780000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Isopropyl benzene	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Methyl acetate	-	-	-	-	µg/kg	37 UJ	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	µg/kg	1.6 J	-	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Methylene chloride	12000	50	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Styrene	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Tetrachloroethene	2000	1300	150000	300000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Toluene	36000	700	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Trichloroethene	2000	470	200000	400000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Vinyl chloride	-	20	13000	27000	µg/kg	7.3 UJ	-	-	-	-	-	-	-
Xylenes (total)	260	1600	500000	1000000	µg/kg	15 UJ	-	-	-	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2,4-Dichlorophenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2,4-Dimethylphenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2,4-Dinitrophenol	-	-	-	-	µg/kg	93000 U	38000 U	-	38000 U	-	94000 U	-	99000 U
2,4-Dinitrotoluene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2,6-Dinitrotoluene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2-Chloronaphthalene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2-Chlorophenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2-Methylnaphthalene	-	-	-	-	µg/kg	8900 J	2000 J	-	4200	-	9600 U	-	10000 U
2-Methylphenol	-	330	500000	1000000	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
2-Nitroaniline	-	-	-	-	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
2-Nitrophenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
3-Nitroaniline	-	-	-	-	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-1 8/30/2016 0-0.1666667 ft bgs	TP-2 8/30/2016 0-0.1666667 ft bgs	TP-2 9/12/2016 0-0.1666667 ft bgs	TP-3 8/30/2016 0-0.1666667 ft bgs	TP-3 9/12/2016 0-0.1666667 ft bgs	TP-4 8/30/2016 0-0.1666667 ft bgs	TP-4 9/12/2016 0-0.1666667 ft bgs	TP-5 8/30/2016 0-0.1666667 ft bgs
4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
4-Chloroaniline	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
4-Methylphenol	-	330	500000	1000000	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
4-Nitroaniline	-	-	-	-	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
4-Nitrophenol	-	-	-	-	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
Acenaphthene	20000	98000	500000	1000000	µg/kg	5500 J	3900 U	-	780 J	-	9600 U	-	10000 U
Acenaphthylene	-	107000	500000	1000000	µg/kg	76000	1900 J	-	6500	-	3600 J	-	2700 J
Acetophenone	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Anthracene	-	1000000	500000	1000000	µg/kg	79000	1000 J	-	5900	-	9600 U	-	10000 U
Atrazine	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Benzaldehyde	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	**200000 bcd**	**6000 bc**	-	**22000 bcd**	-	**6600 J bc**	-	**9800 J bc**
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	**180000 abcd**	**5700 acd**	-	**19000 acd**	-	**6200 J acd**	-	**12000 acd**
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	**210000 bcd**	**8200 bc**	-	**29000 bcd**	-	**6700 J bc**	-	**16000 bcd**
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	140000	4300	-	15000	-	4400 J	-	11000
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	**110000 bc**	**2500 J b**	-	**9800 b**	-	1300 J	-	**3900 J b**
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	3300 J	3900 U	-	920 J	-	9600 U	-	10000 U
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Caprolactam	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Carbazole	-	-	-	-	µg/kg	36000	3900 U	-	2500 J	-	9600 U	-	10000 U
Chrysene	-	1000	56000	110000	µg/kg	**220000 bcd**	**6800 b**	-	**25000 b**	-	**8700 J b**	-	**12000 b**
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	9500 U	3900 U	-	**4900 cd**	-	9600 U	-	10000 U
Dibenzofuran	-	210000	350000	1000000	µg/kg	27000	670 J	-	3700 J	-	9600 U	-	10000 U
Diethyl phthalate	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Dimethyl phthalate	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Fluoranthene	-	100000	500000	1000000	µg/kg	**550000 bc**	11000	-	38000	-	11000	-	17000
Fluorene	30000	386000	500000	1000000	µg/kg	**48000 a**	3900 U	-	2300 J	-	1300 J	-	10000 U
Hexachlorobenzene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Hexachlorobutadiene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Hexachloroethane	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	**120000 bcd**	3900	-	**13000 bcd**	-	3700 J	-	**9100 J bc**
Isophorone	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Naphthalene	-	12000	500000	1000000	µg/kg	**24000 b**	1600 J	-	**19000 b**	-	1600 J	-	4400 J
Nitrobenzene	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Pentachlorophenol	800	800	6700	55000	µg/kg	19000 U	7500 U	-	7500 U	-	19000 U	-	20000 U
Phenanthrene	-	1000000	500000	1000000	µg/kg	410000	4900	-	21000	-	11000	-	9900 J
Phenol	30000	330	500000	1000000	µg/kg	9500 U	3900 U	-	3900 U	-	9600 U	-	10000 U
Pyrene	-	1000000	500000	1000000	µg/kg	430000	9800	-	29000	-	12000	-	14000
Total PAHs	-	-	500000	500000	ug/kg	**2802500 cd**	67600	-	260180	-	78100	-	121800
Total SVOCs	-	-	-	-	ug/kg	2877700	70270	-	271500	-	78100	-	121800
Pesticides/PCBs													
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
Total PCBs	1	1	1	25	mg/kg	0.28 U	-	-	-	-	-	-	-
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	94 U	-	-	-	-	-	-	-
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	94 U	-	-	-	-	-	-	-

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-1 8/30/2016 0-0.1666667 ft bgs	TP-2 8/30/2016 0-0.1666667 ft bgs	TP-2 9/12/2016 0-0.1666667 ft bgs	TP-3 8/30/2016 0-0.1666667 ft bgs	TP-3 9/12/2016 0-0.1666667 ft bgs	TP-4 8/30/2016 0-0.1666667 ft bgs	TP-4 9/12/2016 0-0.1666667 ft bgs	TP-5 8/30/2016 0-0.1666667 ft bgs
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	**43 J [a]**	-	-	-	-	-	-	-
Aldrin	140	190	680	1400	µg/kg	94 U	-	-	-	-	-	-	-
alpha-BHC	40	20	3400	6800	µg/kg	94 U	-	-	-	-	-	-	-
alpha-Chlordane	1300	2900	24000	47000	µg/kg	94 U	-	-	-	-	-	-	-
beta-BHC	600	90	3000	14000	µg/kg	94 U	-	-	-	-	-	-	-
delta-BHC	40	25	500000	1000000	µg/kg	94 U	-	-	-	-	-	-	-
Dieldrin	6	100	1400	2800	µg/kg	94 U	-	-	-	-	-	-	-
Endosulfan I	-	102000	200000	920000	µg/kg	94 U	-	-	-	-	-	-	-
Endosulfan II	-	102000	200000	920000	µg/kg	94 U	-	-	-	-	-	-	-
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	94 U	-	-	-	-	-	-	-
Endrin	14	60	89000	410000	µg/kg	**30 J [a]**	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	µg/kg	94 U	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	µg/kg	94 U	-	-	-	-	-	-	-
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	94 U	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	µg/kg	94 U	-	-	-	-	-	-	-
Heptachlor	140	380	15000	29000	µg/kg	94 U	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	µg/kg	94 U	-	-	-	-	-	-	-
Methoxychlor	-	-	-	-	µg/kg	94 U	-	-	-	-	-	-	-
Toxaphene	-	-	-	-	µg/kg	940 U	-	-	-	-	-	-	-
Metals													
Aluminum	-	-	-	-	mg/kg	7060	-	3410 J	-	7090 J	-	688 J	-
Antimony	-	-	-	-	mg/kg	17.3 UJ	-	0.66 J	-	10.5 J	-	17.9 UJ	-
Arsenic	13	16	16	16	mg/kg	9.9	-	8.2	-	**28.5 [abcd]**	-	3.4	-
Barium	433	820	400	10000	mg/kg	120	-	17.2 J	-	170 J	-	46.0 J	-
Beryllium	10	47	590	2700	mg/kg	1.4	-	1.4	-	0.79	-	1.7	-
Cadmium	4	7.5	9.3	60	mg/kg	1.4 J	-	0.84	-	**39.1 [abc]**	-	0.15 J	-
Calcium	-	-	-	-	mg/kg	12300	-	3540	-	17700	-	651	-
Chromium	41	-	1500	6800	mg/kg	**57.0 [a]**	-	14.2	-	**303 [a]**	-	6.3	-
Cobalt	-	-	-	-	mg/kg	6.7	-	9.0	-	15.8	-	4.6	-
Copper	50	1720	270	10000	mg/kg	36.8	-	19.5	-	560	-	12.7	-
Iron	-	-	-	-	mg/kg	19700	-	12100	-	81400	-	3200	-
Lead	63	450	1000	3900	mg/kg	**142 [a]**	-	**72.2 J [a]**	-	**1420 J [abc]**	-	**106 J [a]**	-
Magnesium	-	-	-	-	mg/kg	2960	-	609	-	3830	-	131	-
Manganese	1600	2000	10000	10000	mg/kg	1440	-	364	-	**1680 [a]**	-	21.8	-
Mercury	0.18	0.73	2.8	5.7	mg/kg	**0.21 [a]**	-	0.094	-	**1.2 [ab]**	-	0.090	-
Nickel	30	130	310	10000	mg/kg	**31.4 [a]**	-	23.5	-	**224 [ab]**	-	17.2	-
Potassium	-	-	-	-	mg/kg	994 J	-	332 J	-	1020 J	-	115 J	-
Selenium	3.9	4	1500	6800	mg/kg	1.9 J	-	2.2 J	-	5.3 U	-	1.9 J	-
Silver	2	8.3	1500	6800	mg/kg	0.69 U	-	0.86 U	-	1.3	-	0.71 U	-
Sodium	-	-	-	-	mg/kg	169	-	69.3 J	-	191	-	31.7 J	-
Thallium	-	-	-	-	mg/kg	6.9 U	-	8.6 U	-	8.0 U	-	7.1 U	-
Vanadium	-	-	-	-	mg/kg	34.2	-	15.2	-	68.4	-	25.8	-
Zinc	109	2480	10000	10000	mg/kg	**216 [a]**	-	**141 J [a]**	-	**5940 J [ab]**	-	21.8 J	-
General Chemistry													
Cyanide (total)	-	40	27	10000	mg/kg	0.85 J	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	mg/kg	551000 J	-	729000 J	-	253000 J	-	956000 J	-

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-5 9/12/2016 0-0.1666667 ft bgs	TP-6 8/30/2016 0-0.1666667 ft bgs	TP-6 9/12/2016 0-0.1666667 ft bgs	TP-7 8/30/2016 0-0.1666667 ft bgs	TP-7 9/12/2016 0-0.1666667 ft bgs	TP-8 9/1/2016 0-0.1666667 ft bgs	TP-8 9/12/2016 0-0.1666667 ft bgs	TP-9 9/1/2016 0-0.1666667 ft bgs
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	270	240000	480000	µg/kg	-	-	-	-	-	-	-	-
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	-	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
2-Hexanone	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Acetone	2200	50	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
Benzene	70000	60	44000	89000	µg/kg	-	-	-	-	-	-	-	-
Bromodichloromethane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Bromoform	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Carbon disulfide	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	760	22000	44000	µg/kg	-	-	-	-	-	-	-	-
Chlorobenzene	40000	1100	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Ethylbenzene	-	1000	390000	780000	µg/kg	-	-	-	-	-	-	-	-
Isopropyl benzene	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Methyl acetate	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
Methylene chloride	12000	50	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
Styrene	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Tetrachloroethene	2000	1300	150000	300000	µg/kg	-	-	-	-	-	-	-	-
Toluene	36000	700	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Trichloroethene	2000	470	200000	400000	µg/kg	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Vinyl chloride	-	20	13000	27000	µg/kg	-	-	-	-	-	-	-	-
Xylenes (total)	260	1600	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2,4-Dichlorophenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2,4-Dimethylphenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2,4-Dinitrophenol	-	-	-	-	µg/kg	-	92000 U	-	36000 U	-	20000 U	-	22000 U
2,4-Dinitrotoluene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2,6-Dinitrotoluene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2-Chloronaphthalene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2-Chlorophenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2-Methylnaphthalene	-	-	-	-	µg/kg	-	9500 U	-	870 J	-	2100 U	-	2200 U
2-Methylphenol	-	330	500000	1000000	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
2-Nitroaniline	-	-	-	-	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
2-Nitrophenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
3-Nitroaniline	-	-	-	-	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U

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4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
4-Chloroaniline	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
4-Methylphenol	-	330	500000	1000000	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
4-Nitroaniline	-	-	-	-	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
4-Nitrophenol	-	-	-	-	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
Acenaphthene	20000	98000	500000	1000000	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Acenaphthylene	-	107000	500000	1000000	µg/kg	-	9500 U	-	780 J	-	2100 U	-	2200 U
Acetophenone	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Anthracene	-	1000000	500000	1000000	µg/kg	-	9500 U	-	930 J	-	2100 U	-	660 J
Atrazine	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Benzaldehyde	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	-	**4000 J [b]**	-	**4000 [b]**	-	**1200 J [b]**	-	1000 J
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	-	**4900 J [acd]**	-	**5000 [acd]**	-	**1100 J [c]**	-	840 J
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	-	**6200 J [bc]**	-	**6200 [bc]**	-	1500 J	-	1100 J
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	-	4000 J	-	4400	-	830 J	-	580 J
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	-	9500 U	-	**2400 J [b]**	-	280 J	-	2200 U
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Caprolactam	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Carbazole	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Chrysene	-	1000	56000	110000	µg/kg	-	**5100 J [b]**	-	**4800 [b]**	-	**1200 J [b]**	-	1000 J
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	-	9500 U	-	**1100 J [c]**	-	2100 U	-	2200 U
Dibenzofuran	-	210000	350000	1000000	µg/kg	-	9500 U	-	770 J	-	2100 U	-	2200 U
Diethyl phthalate	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Dimethyl phthalate	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Fluoranthene	-	100000	500000	1000000	µg/kg	-	5500 J	-	5600	-	2100	-	2500
Fluorene	30000	386000	500000	1000000	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Hexachlorobenzene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Hexachlorobutadiene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Hexachloroethane	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	-	3600 J	-	3700	-	750 J	-	500 J
Isophorone	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Naphthalene	-	12000	500000	1000000	µg/kg	-	3100 J	-	3600 J	-	440 J	-	2200 U
Nitrobenzene	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Pentachlorophenol	800	800	6700	55000	µg/kg	-	18000 U	-	7200 U	-	4000 U	-	4300 U
Phenanthrene	-	1000000	500000	1000000	µg/kg	-	3600 J	-	3600 J	-	1100 J	-	2100 J
Phenol	30000	330	500000	1000000	µg/kg	-	9500 U	-	3700 U	-	2100 U	-	2200 U
Pyrene	-	1000000	500000	1000000	µg/kg	-	4400 J	-	4800	-	1800 J	-	1800 J
Total PAHs	-	-	500000	500000	ug/kg	-	44400	-	50910	-	12300	-	12080
Total SVOCs	-	-	-	-	ug/kg	-	44400	-	52550	-	12300	-	12080
Pesticides/PCBs													
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
Total PCBs	1	1	1	25	mg/kg	-	-	-	-	-	-	-	-
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	-	-	-	-	-	-	-	-
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	-	-	-	-	-	-	-	-

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-5 9/12/2016 0-0.1666667 ft bgs	TP-6 8/30/2016 0-0.1666667 ft bgs	TP-6 9/12/2016 0-0.1666667 ft bgs	TP-7 8/30/2016 0-0.1666667 ft bgs	TP-7 9/12/2016 0-0.1666667 ft bgs	TP-8 9/1/2016 0-0.1666667 ft bgs	TP-8 9/12/2016 0-0.1666667 ft bgs	TP-9 9/1/2016 0-0.1666667 ft bgs
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	-	-	-	-	-	-	-	-
Aldrin	140	190	680	1400	µg/kg	-	-	-	-	-	-	-	-
alpha-BHC	40	20	3400	6800	µg/kg	-	-	-	-	-	-	-	-
alpha-Chlordane	1300	2900	24000	47000	µg/kg	-	-	-	-	-	-	-	-
beta-BHC	600	90	3000	14000	µg/kg	-	-	-	-	-	-	-	-
delta-BHC	40	25	500000	1000000	µg/kg	-	-	-	-	-	-	-	-
Dieldrin	6	100	1400	2800	µg/kg	-	-	-	-	-	-	-	-
Endosulfan I	-	102000	200000	920000	µg/kg	-	-	-	-	-	-	-	-
Endosulfan II	-	102000	200000	920000	µg/kg	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	-	-	-	-	-	-	-	-
Endrin	14	60	89000	410000	µg/kg	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Heptachlor	140	380	15000	29000	µg/kg	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Methoxychlor	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Toxaphene	-	-	-	-	µg/kg	-	-	-	-	-	-	-	-
Metals													
Aluminum	-	-	-	-	mg/kg	6060 J	-	2940 J	-	1790 J	-	15500 J	-
Antimony	-	-	-	-	mg/kg	1.3 J	-	0.75 J	-	18.4 UJ	-	2.3 J	-
Arsenic	13	16	16	16	mg/kg	8.4	-	12.8	-	3.5	-	**28.3** [abcd]	-
Barium	433	820	400	10000	mg/kg	90.0 J	-	50.5 J	-	34.1 J	-	187 J	-
Beryllium	10	47	590	2700	mg/kg	0.83	-	0.32	-	0.30	-	1.3	-
Cadmium	4	7.5	9.3	60	mg/kg	0.72	-	0.22 J	-	0.98	-	1.3	-
Calcium	-	-	-	-	mg/kg	14000	-	4620	-	7130	-	20200	-
Chromium	41	-	1500	6800	mg/kg	**257** [a]	-	21.1	-	11.0	-	**56.3** [a]	-
Cobalt	-	-	-	-	mg/kg	6.2	-	3.2	-	2.8	-	9.4	-
Copper	50	1720	270	10000	mg/kg	42.3	-	20.7	-	15.9	-	42.9	-
Iron	-	-	-	-	mg/kg	21000	-	9960	-	6480	-	36300	-
Lead	63	450	1000	3900	mg/kg	**138 J** [a]	-	16.1 J	-	12.7 J	-	**81.9 J** [a]	-
Magnesium	-	-	-	-	mg/kg	3770	-	1330	-	760	-	7370	-
Manganese	1600	2000	10000	10000	mg/kg	**3440** [ab]	-	416	-	229	-	564	-
Mercury	0.18	0.73	2.8	5.7	mg/kg	**0.99** [ab]	-	0.13	-	0.043	-	**0.34** [a]	-
Nickel	30	130	310	10000	mg/kg	**45.9** [a]	-	13.1	-	6.3	-	29.1	-
Potassium	-	-	-	-	mg/kg	999 J	-	606 J	-	456 J	-	2690 J	-
Selenium	3.9	4	1500	6800	mg/kg	5.5 U	-	1.1 J	-	0.92 J	-	1.2 J	-
Silver	2	8.3	1500	6800	mg/kg	0.65 J	-	1.4	-	0.74 U	-	0.75 U	-
Sodium	-	-	-	-	mg/kg	121 J	-	75.1 J	-	78.1 J	-	375	-
Thallium	-	-	-	-	mg/kg	8.2 U	-	7.7 U	-	7.4 U	-	7.5 U	-
Vanadium	-	-	-	-	mg/kg	78.9	-	32.9	-	9.9	-	33.6	-
Zinc	109	2480	10000	10000	mg/kg	**125 J** [a]	-	43.0 J	-	**147 J** [a]	-	**194 J** [a]	-
General Chemistry													
Cyanide (total)	-	40	27	10000	mg/kg	-	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	mg/kg	434000 J	-	356000 J	-	594000 J	-	90500	-

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-9 9/12/2016 0-0.1666667 ft bgs	TP-10 9/1/2016 0-0.1666667 ft bgs	TP-10 9/12/2016 0-0.1666667 ft bgs	TP-11 9/1/2016 0-0.1666667 ft bgs	TP-11 9/12/2016 0-0.1666667 ft bgs	TP-12 9/1/2016 0-0.1666667 ft bgs	TP-13 9/1/2016 0-0.1666667 ft bgs	TP-13 9/12/2016 0-0.1666667 ft bgs
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
1,1,2-Trichloroethane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
1,1-Dichloroethane	-	270	240000	480000	µg/kg	-	-	-	-	-	5.1 U	-	-
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	-	-	-	-	-	5.1 U	-	-
1,2-Dichloropropane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	-	-	-	-	-	5.1 U	-	-
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	-	-	-	-	-	5.1 U	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	-	-	-	-	-	25 U	-	-
2-Hexanone	-	-	-	-	µg/kg	-	-	-	-	-	25 U	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	-	-	-	-	-	25 U	-	-
Acetone	2200	50	500000	1000000	µg/kg	-	-	-	-	-	25 U	-	-
Benzene	70000	60	44000	89000	µg/kg	-	-	-	-	-	5.1 U	-	-
Bromodichloromethane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Bromoform	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Carbon disulfide	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Carbon tetrachloride	-	760	22000	44000	µg/kg	-	-	-	-	-	5.1 U	-	-
Chlorobenzene	40000	1100	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
Chloroethane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	-	-	-	-	-	5.1 U	-	-
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Cyclohexane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Dibromochloromethane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Ethylbenzene	-	1000	390000	780000	µg/kg	-	-	-	-	-	5.1 U	-	-
Isopropyl benzene	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Methyl acetate	-	-	-	-	µg/kg	-	-	-	-	-	25 U	-	-
Methyl cyclohexane	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
Methylene chloride	12000	50	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
Styrene	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Tetrachloroethene	2000	1300	150000	300000	µg/kg	-	-	-	-	-	5.1 U	-	-
Toluene	36000	700	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	-	-	-	-	-	5.1 U	-	-
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Trichloroethene	2000	470	200000	400000	µg/kg	-	-	-	-	-	5.1 U	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	-	-	-	-	-	5.1 U	-	-
Vinyl chloride	-	20	13000	27000	µg/kg	-	-	-	-	-	5.1 U	-	-
Xylenes (total)	260	1600	500000	1000000	µg/kg	-	-	-	-	-	10 U	-	-
Semi-volatile Organic Compounds (SVOCs)													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2,4-Dichlorophenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2,4-Dimethylphenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2,4-Dinitrophenol	-	-	-	-	µg/kg	-	20000 U	-	20000 U	-	110000 U	22000 U	-
2,4-Dinitrotoluene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2,6-Dinitrotoluene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2-Chloronaphthalene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2-Chlorophenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2-Methylnaphthalene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2-Methylphenol	-	330	500000	1000000	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
2-Nitroaniline	-	-	-	-	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
2-Nitrophenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
3-Nitroaniline	-	-	-	-	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-

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Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-9 9/12/2016 0-0.1666667 ft bgs	TP-10 9/1/2016 0-0.1666667 ft bgs	TP-10 9/12/2016 0-0.1666667 ft bgs	TP-11 9/1/2016 0-0.1666667 ft bgs	TP-11 9/12/2016 0-0.1666667 ft bgs	TP-12 9/1/2016 0-0.1666667 ft bgs	TP-13 9/1/2016 0-0.1666667 ft bgs	TP-13 9/12/2016 0-0.1666667 ft bgs
4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
4-Chloroaniline	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
4-Methylphenol	-	330	500000	1000000	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
4-Nitroaniline	-	-	-	-	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
4-Nitrophenol	-	-	-	-	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
Acenaphthene	20000	98000	500000	1000000	µg/kg	-	2100 U	-	480 J	-	11000 U	2200 U	-
Acenaphthylene	-	107000	500000	1000000	µg/kg	-	2100 U	-	2100 U	-	2100 J	290 J	-
Acetophenone	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Anthracene	-	1000000	500000	1000000	µg/kg	-	2100 U	-	1200 J	-	11000 U	2200 U	-
Atrazine	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Benzaldehyde	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	-	780 J	-	**2200** [b]	-	**8100 J** [bc]	**1300 J** [b]	-
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	-	750 J	-	**1800 J** [cd]	-	**10000 J** [acd]	**1500 J** [cd]	-
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	-	990 J	-	**2200** [b]	-	**11000** [bc]	**1800 J** [b]	-
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	-	560 J	-	1100 J	-	9300 J	1100 J	-
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	-	2100 U	-	700 J	-	**3000 J** [b]	380 J	-
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Caprolactam	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Carbazole	-	-	-	-	µg/kg	-	2100 U	-	460 J	-	11000 U	2200 U	-
Chrysene	-	1000	56000	110000	µg/kg	-	840 J	-	**2100** [b]	-	**9400 J** [b]	**1400 J** [b]	-
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Dibenzofuran	-	210000	350000	1000000	µg/kg	-	2100 U	-	450 J	-	11000 U	2200 U	-
Diethyl phthalate	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Dimethyl phthalate	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Fluoranthene	-	100000	500000	1000000	µg/kg	-	1300 J	-	4700	-	14000	2100 J	-
Fluorene	30000	386000	500000	1000000	µg/kg	-	2100 U	-	610 J	-	11000 U	2200 U	-
Hexachlorobenzene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Hexachlorobutadiene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Hexachloroethane	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	-	440 J	-	1100 J	-	**7800 J** [c]	1000 J	-
Isophorone	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Naphthalene	-	12000	500000	1000000	µg/kg	-	2100 U	-	370 J	-	11000 U	2200 U	-
Nitrobenzene	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Pentachlorophenol	800	800	6700	55000	µg/kg	-	4000 U	-	4000 U	-	21000 U	4300 U	-
Phenanthrene	-	1000000	500000	1000000	µg/kg	-	510 J	-	4200	-	8400 J	940 J	-
Phenol	30000	330	500000	1000000	µg/kg	-	2100 U	-	2100 U	-	11000 U	2200 U	-
Pyrene	-	1000000	500000	1000000	µg/kg	-	1100 J	-	3400	-	13000	1800 J	-
Total PAHs	-	-	500000	500000	ug/kg	-	7270	-	26160	-	96100	13610	-
Total SVOCs	-	-	-	-	ug/kg	-	7270	-	27070	-	96100	13610	-
Pesticides/PCBs													
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
Total PCBs	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	-	-
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	-	-	-	-	-	4.2 U	-	-
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	-	-	-	-	-	4.2 U	-	-

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-9 9/12/2016 0-0.1666667 ft bgs	TP-10 9/1/2016 0-0.1666667 ft bgs	TP-10 9/12/2016 0-0.1666667 ft bgs	TP-11 9/1/2016 0-0.1666667 ft bgs	TP-11 9/12/2016 0-0.1666667 ft bgs	TP-12 9/1/2016 0-0.1666667 ft bgs	TP-13 9/1/2016 0-0.1666667 ft bgs	TP-13 9/12/2016 0-0.1666667 ft bgs
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	-	-	-	-	-	**2.1 J** [a]	-	-
Aldrin	140	190	680	1400	µg/kg	-	-	-	-	-	4.2 U	-	-
alpha-BHC	40	20	3400	6800	µg/kg	-	-	-	-	-	4.2 U	-	-
alpha-Chlordane	1300	2900	24000	47000	µg/kg	-	-	-	-	-	4.2 U	-	-
beta-BHC	600	90	3000	14000	µg/kg	-	-	-	-	-	4.2 U	-	-
delta-BHC	40	25	500000	1000000	µg/kg	-	-	-	-	-	4.2 U	-	-
Dieldrin	6	100	1400	2800	µg/kg	-	-	-	-	-	4.2 U	-	-
Endosulfan I	-	102000	200000	920000	µg/kg	-	-	-	-	-	4.2 U	-	-
Endosulfan II	-	102000	200000	920000	µg/kg	-	-	-	-	-	4.2 U	-	-
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	-	-	-	-	-	4.2 U	-	-
Endrin	14	60	89000	410000	µg/kg	-	-	-	-	-	4.2 U	-	-
Endrin aldehyde	-	-	-	-	µg/kg	-	-	-	-	-	4.2 U	-	-
Endrin ketone	-	-	-	-	µg/kg	-	-	-	-	-	4.2 U	-	-
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	-	-	-	-	-	4.2 U	-	-
gamma-Chlordane	-	-	-	-	µg/kg	-	-	-	-	-	4.2 U	-	-
Heptachlor	140	380	15000	29000	µg/kg	-	-	-	-	-	4.2 U	-	-
Heptachlor epoxide	-	-	-	-	µg/kg	-	-	-	-	-	4.2 U	-	-
Methoxychlor	-	-	-	-	µg/kg	-	-	-	-	-	4.2 U	-	-
Toxaphene	-	-	-	-	µg/kg	-	-	-	-	-	42 U	-	-
Metals													
Aluminum	-	-	-	-	mg/kg	12100 J	-	7860 J	-	9850 J	15900	-	14100 J
Antimony	-	-	-	-	mg/kg	2.1 J	-	2.9 J	-	2.4 J	18.8 UJ	-	1.3 J
Arsenic	13	16	16	16	mg/kg	**22.9** [abcd]	-	12.6	-	12.5	9.9	-	5.9
Barium	433	820	400	10000	mg/kg	133 J	-	85.8 J	-	114 J	140	-	109 J
Beryllium	10	47	590	2700	mg/kg	1.1	-	0.60	-	0.75	1.8	-	0.87
Cadmium	4	7.5	9.3	60	mg/kg	2.4	-	3.9	-	**4.9** [a]	**71.5 J** [abcd]	-	0.72
Calcium	-	-	-	-	mg/kg	20200	-	10200	-	16000	57700	-	36200
Chromium	41	-	1500	6800	mg/kg	**47.0** [a]	-	**71.7** [a]	-	**57.9** [a]	20.9	-	31.8
Cobalt	-	-	-	-	mg/kg	8.1	-	6.8	-	6.0	8.0	-	9.6
Copper	50	1720	270	10000	mg/kg	48.5	-	**77.4** [a]	-	**57.4** [a]	37.1	-	**56.7** [a]
Iron	-	-	-	-	mg/kg	29700	-	34400	-	30700	19500	-	23000
Lead	63	450	1000	3900	mg/kg	**135 J** [a]	-	**209 J** [a]	-	**249 J** [a]	**70.3** [a]	-	**141 J** [a]
Magnesium	-	-	-	-	mg/kg	5050	-	2980	-	3520	9420	-	10400
Manganese	1600	2000	10000	10000	mg/kg	598	-	801	-	994	1020	-	701
Mercury	0.18	0.73	2.8	5.7	mg/kg	0.10	-	0.15	-	0.12	**0.45** [a]	-	0.16
Nickel	30	130	310	10000	mg/kg	25.5	-	**31.1** [a]	-	25.4	21.6	-	24.8
Potassium	-	-	-	-	mg/kg	2050 J	-	1210 J	-	1240 J	2500 J	-	3170 J
Selenium	3.9	4	1500	6800	mg/kg	4.7 U	-	5.3 U	-	5.2 U	1.6 J	-	4.9 U
Silver	2	8.3	1500	6800	mg/kg	0.70 U	-	0.54 J	-	0.69 J	0.75 U	-	0.74 U
Sodium	-	-	-	-	mg/kg	266	-	124 J	-	228	466	-	169 J
Thallium	-	-	-	-	mg/kg	7.0 U	-	8.0 U	-	7.8 U	7.5 U	-	7.4 U
Vanadium	-	-	-	-	mg/kg	25.5	-	15.5	-	16.2	28.2	-	27.3
Zinc	109	2480	10000	10000	mg/kg	**329 J** [a]	-	**554 J** [a]	-	**650 J** [a]	**113** [a]	-	**197 J** [a]
General Chemistry													
Cyanide (total)	-	40	27	10000	mg/kg	-	-	-	-	-	1.4	-	-
Total organic carbon (TOC)	-	-	-	-	mg/kg	78600	-	60100	-	48200	117000	-	63300

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-14 9/1/2016 0-0.1666667 ft bgs	TP-14 9/12/2016 0-0.1666667 ft bgs	TP-15 9/1/2016 0-0.1666667 ft bgs	TP-15 9/12/2016 0-0.1666667 ft bgs
Volatile Organic Compounds (VOCs)									
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	µg/kg	-	-	-	-
1,1-Dichloroethane	-	270	240000	480000	µg/kg	-	-	-	-
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	-	-	-	-
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	-	-	-	-
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	-	-	-	-
1,2-Dichloropropane	-	-	-	-	µg/kg	-	-	-	-
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	-	-	-	-
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	-	-	-	-
2-Hexanone	-	-	-	-	µg/kg	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	-	-	-	-
Acetone	2200	50	500000	1000000	µg/kg	-	-	-	-
Benzene	70000	60	44000	89000	µg/kg	-	-	-	-
Bromodichloromethane	-	-	-	-	µg/kg	-	-	-	-
Bromoform	-	-	-	-	µg/kg	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	-	-	-	-
Carbon disulfide	-	-	-	-	µg/kg	-	-	-	-
Carbon tetrachloride	-	760	22000	44000	µg/kg	-	-	-	-
Chlorobenzene	40000	1100	500000	1000000	µg/kg	-	-	-	-
Chloroethane	-	-	-	-	µg/kg	-	-	-	-
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	-	-	-	-
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	-	-	-	-
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-
Cyclohexane	-	-	-	-	µg/kg	-	-	-	-
Dibromochloromethane	-	-	-	-	µg/kg	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	-	-	-	-
Ethylbenzene	-	1000	390000	780000	µg/kg	-	-	-	-
Isopropyl benzene	-	-	-	-	µg/kg	-	-	-	-
Methyl acetate	-	-	-	-	µg/kg	-	-	-	-
Methyl cyclohexane	-	-	-	-	µg/kg	-	-	-	-
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	-	-	-	-
Methylene chloride	12000	50	500000	1000000	µg/kg	-	-	-	-
Styrene	-	-	-	-	µg/kg	-	-	-	-
Tetrachloroethene	2000	1300	150000	300000	µg/kg	-	-	-	-
Toluene	36000	700	500000	1000000	µg/kg	-	-	-	-
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-
Trichloroethene	2000	470	200000	400000	µg/kg	-	-	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	-	-	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	-	-	-	-
Vinyl chloride	-	20	13000	27000	µg/kg	-	-	-	-
Xylenes (total)	260	1600	500000	1000000	µg/kg	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2,4-Dichlorophenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2,4-Dimethylphenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2,4-Dinitrophenol	-	-	-	-	µg/kg	95000 U	-	120000 U	-
2,4-Dinitrotoluene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2,6-Dinitrotoluene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2-Chloronaphthalene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2-Chlorophenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
2-Methylnaphthalene	-	-	-	-	µg/kg	9800 U	-	12000	-
2-Methylphenol	-	330	500000	1000000	µg/kg	9800 U	-	12000 U	-
2-Nitroaniline	-	-	-	-	µg/kg	19000 U	-	24000 U	-
2-Nitrophenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	19000 U	-	24000 U	-
3-Nitroaniline	-	-	-	-	µg/kg	19000 U	-	24000 U	-

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-14 9/1/2016 0-0.1666667 ft bgs	TP-14 9/12/2016 0-0.1666667 ft bgs	TP-15 9/1/2016 0-0.1666667 ft bgs	TP-15 9/12/2016 0-0.1666667 ft bgs
4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	19000 U	-	24000 U	-
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	9800 U	-	12000 U	-
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	9800 U	-	12000 U	-
4-Chloroaniline	-	-	-	-	µg/kg	9800 U	-	12000 U	-
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	9800 U	-	12000 U	-
4-Methylphenol	-	330	500000	1000000	µg/kg	19000 U	-	24000 U	-
4-Nitroaniline	-	-	-	-	µg/kg	19000 U	-	24000 U	-
4-Nitrophenol	-	-	-	-	µg/kg	19000 U	-	24000 U	-
Acenaphthene	20000	98000	500000	1000000	µg/kg	9800 U	-	2300 J	-
Acenaphthylene	-	107000	500000	1000000	µg/kg	9800 U	-	17000	-
Acetophenone	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Anthracene	-	1000000	500000	1000000	µg/kg	9800 U	-	16000	-
Atrazine	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Benzaldehyde	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	**2200 J** [b]	-	**40000** [bcd]	-
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	**2200 J** [acd]	-	**41000** [abcd]	-
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	**3000 J** [b]	-	**40000** [bcd]	-
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	1800 J	-	32000	-
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	9800 U	-	**20000** [b]	-
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	9800 U	-	2400 J	-
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	9800 U	-	12000 U	-
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	9800 U	-	12000 U	-
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Caprolactam	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Carbazole	-	-	-	-	µg/kg	9800 U	-	5600 J	-
Chrysene	-	1000	56000	110000	µg/kg	**2200 J** [b]	-	**46000** [b]	-
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	9800 U	-	12000 U	-
Dibenzofuran	-	210000	350000	1000000	µg/kg	9800 U	-	4200 J	-
Diethyl phthalate	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Dimethyl phthalate	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Fluoranthene	-	100000	500000	1000000	µg/kg	3600 J	-	74000	-
Fluorene	30000	386000	500000	1000000	µg/kg	9800 U	-	11000 J	-
Hexachlorobenzene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Hexachlorobutadiene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Hexachloroethane	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	1700 J	-	**24000** [bcd]	-
Isophorone	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Naphthalene	-	12000	500000	1000000	µg/kg	9800 U	-	**33000** [b]	-
Nitrobenzene	-	-	-	-	µg/kg	9800 U	-	12000 U	-
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	9800 U	-	12000 U	-
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	9800 U	-	12000 U	-
Pentachlorophenol	800	800	6700	55000	µg/kg	19000 U	-	24000 U	-
Phenanthrene	-	1000000	500000	1000000	µg/kg	1500 J	-	86000	-
Phenol	30000	330	500000	1000000	µg/kg	9800 U	-	12000 U	-
Pyrene	-	1000000	500000	1000000	µg/kg	2800 J	-	79000	-
Total PAHs	-	-	500000	500000	ug/kg	21000	-	**561300** [cd]	-
Total SVOCs	-	-	-	-	ug/kg	21000	-	585500	-
Pesticides/PCBs									
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	-	-	-	-
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	-	-	-	-
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	-	-	-	-
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	-	-	-	-
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	-	-	-	-
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	-	-	-	-
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	-	-	-	-
Total PCBs	1	1	1	25	mg/kg	-	-	-	-
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	-	-	-	-
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	-	-	-	-

Table 2.2

2016 Surface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-14 9/1/2016 0-0.1666667 ft bgs	TP-14 9/12/2016 0-0.1666667 ft bgs	TP-15 9/1/2016 0-0.1666667 ft bgs	TP-15 9/12/2016 0-0.1666667 ft bgs
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	-	-	-	-
Aldrin	140	190	680	1400	µg/kg	-	-	-	-
alpha-BHC	40	20	3400	6800	µg/kg	-	-	-	-
alpha-Chlordane	1300	2900	24000	47000	µg/kg	-	-	-	-
beta-BHC	600	90	3000	14000	µg/kg	-	-	-	-
delta-BHC	40	25	500000	1000000	µg/kg	-	-	-	-
Dieldrin	6	100	1400	2800	µg/kg	-	-	-	-
Endosulfan I	-	102000	200000	920000	µg/kg	-	-	-	-
Endosulfan II	-	102000	200000	920000	µg/kg	-	-	-	-
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	-	-	-	-
Endrin	14	60	89000	410000	µg/kg	-	-	-	-
Endrin aldehyde	-	-	-	-	µg/kg	-	-	-	-
Endrin ketone	-	-	-	-	µg/kg	-	-	-	-
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	-	-	-	-
gamma-Chlordane	-	-	-	-	µg/kg	-	-	-	-
Heptachlor	140	380	15000	29000	µg/kg	-	-	-	-
Heptachlor epoxide	-	-	-	-	µg/kg	-	-	-	-
Methoxychlor	-	-	-	-	µg/kg	-	-	-	-
Toxaphene	-	-	-	-	µg/kg	-	-	-	-
Metals									
Aluminum	-	-	-	-	mg/kg	-	14200 J	-	6960 J
Antimony	-	-	-	-	mg/kg	-	1.6 J	-	1.7 J
Arsenic	13	16	16	16	mg/kg	-	5.9	-	**16.8** [abcd]
Barium	433	820	400	10000	mg/kg	-	119 J	-	**594 J** [ac]
Beryllium	10	47	590	2700	mg/kg	-	1.1	-	0.85
Cadmium	4	7.5	9.3	60	mg/kg	-	0.77	-	1.8
Calcium	-	-	-	-	mg/kg	-	38400	-	10500
Chromium	41	-	1500	6800	mg/kg	-	32.7	-	36.0
Cobalt	-	-	-	-	mg/kg	-	8.1	-	78.3
Copper	50	1720	270	10000	mg/kg	-	**60.2** [a]	-	**73.2** [a]
Iron	-	-	-	-	mg/kg	-	25500	-	26900
Lead	63	450	1000	3900	mg/kg	-	**750 J** [ab]	-	**1140 J** [abc]
Magnesium	-	-	-	-	mg/kg	-	10400	-	1670
Manganese	1600	2000	10000	10000	mg/kg	-	919	-	285
Mercury	0.18	0.73	2.8	5.7	mg/kg	-	**0.23** [a]	-	**5.0** [abc]
Nickel	30	130	310	10000	mg/kg	-	20.9	-	**821** [abc]
Potassium	-	-	-	-	mg/kg	-	2700 J	-	1130 J
Selenium	3.9	4	1500	6800	mg/kg	-	5.2 U	-	1.9 J
Silver	2	8.3	1500	6800	mg/kg	-	0.77 U	-	1.1 U
Sodium	-	-	-	-	mg/kg	-	219	-	1270
Thallium	-	-	-	-	mg/kg	-	7.7 U	-	21.7 U
Vanadium	-	-	-	-	mg/kg	-	26.3	-	2000
Zinc	109	2480	10000	10000	mg/kg	-	**208 J** [a]	-	317 J
General Chemistry									
Cyanide (total)	-	40	27	10000	mg/kg	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	mg/kg	-	56000	-	406000 J

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.3

1989 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Source	**TP-1(Q&S)**	**TP-1(Q&S) dup**
Date	**6-19-89**	**6-19-89**
TCL VOCs (µg/Kg)		
Methylene Chloride	44*	29*
Acetone	42*	24*
Toluene	9	8
Total Xylenes	11	11
TCL BNAs (µg/Kg)		
Napthalene	14,000	21,000
2-Methynapthalene	7,400	14,000
Acenaphthylene	2,900	5,000
Acenaphthene	970	ND(2,100)
Dibenzofuran	640	ND(2,100)
Fluorene	4,600	6,000
Phenanthrene	17,000	29,000
Anthracene	ND (4,200)	5,000
Fluoranthene	8,800	20,000
Pyrene	12,000	18,000
Benzo(a)Anthracene	4,400	9,800
Chrysene	5,700	11,000
Benzo(b)Fluoranthene (1)	5,200	11,000
Benzo(k)Fluoranthene (1)	5,200	11,000
Benzo(a)Pyrene	4,800	8,700
Dibenzo(a,h)Anthracene	510	ND(2,100)
Benzo(g,h,i)Perylene	2,100	3,600
Total PAHs	90,280	162,500
TAL Metals (mg/Kg)		
Aluminum	9,570	13,400
Arsenic	10.6	4.1
Barium	118	105
Beryllium	0.69	0.7
Calcium	27,100	41,600
Chromium	116.1	17.6

Table 2.3

1989 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Source	**TP-1(Q&S)**	**TP-1(Q&S) dup**
Date	**6-19-89**	**6-19-89**
Cobalt	10	12.1
Copper	43.2	68.7
Iron	35,700	21,800
Lead	81.8	36.3
Magnesium	8,190	12,500
Manganese	579	488
Mercury	1.0	0.4
Nickel	16.4	22.2
TAL Metals (mg/Kg)		
Potassium	1290*	2,090*
Selenium	ND(0.74)	ND(1.3)
Sodium	ND(361)	ND(399)
Vanadium	46.7	33.5
Zinc	136	95.5
Other Compounds (mg/Kg)		
Cyanide	186	271
Oil & Grease	3,300	38,000
Hexavalent Chromium	<0.5R**	<0.5R**
TCLP VOCs (µg/L)		
Benzene	4J	2J
Methylene Chloride	31*	14*
2-Butanone	38	ND(10)
Toluene	75	5
TCLP BNAs (µg/L)		
3-MethylPhenol (1)	all phenolic data	ND(10)
4-MethylPhenol (1)	qualified X	ND(10)
Pentachlorophenol		ND (20)

Table 2.3

1989 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Source	**TP-1(Q&S)**	**TP-1(Q&S) dup**
Date	**6-19-89**	**6-19-89**
TCLP Metals (µg/L)		
Arsenic	8.4	49.3
Barium	769	679
Chromium	4.8	132
Lead	14.5	389
Mercury	ND(0.20)	37.2
Selenium	ND(10.0)	ND(5.0)

Notes:

All other TCL/TAL/TCLP parameters were not detected in any samples.

re Samples S-2428-DT-002,003 and 004 were reanalyzed for VOCs (sample IDs noted with the suffix - re) due to outlying surrogate spike recoveries. The reanalyzed samples showed similar surrogate spike recoveries.

C Denotes a compound whose concentration is estimated due to unsatisfactory percent differences (%D's) in response factors determined from the calibration.

* Also present in laboratory blanks, indicating possible/probable laboratory contamination.

ND Not detected above quantifiable limits stated in parentheses.

R Unusable data due to holding time exceedence.

** The concentration of Cr+6 may have been equal to, however not greater than, the amount of total chrome detected in the associated sample.

M Indicated matrix spike recoveries were outside control limits and may reflect a high bias in sample data.

W Indicated spike recoveries were outside control limits and may reflect a low bias in sample data.

(1) Indistinguishable isomers, reported value is total concentration.

X Unusable data due to low surrogate spike recoveries. All sample data for the affected compounds were non-detected.

*** As per TAGM #4046, Total Pesticides <10ppm.

**** Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4-61ppm. Average background levels in metropolitan or surburban areas or near highways are much higher and typically range from 200-500 ppm.

SB Site Background.

(2) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

Table 2.4

2005 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				TEST PIT-1	TEST PIT-2	TEST PIT-3
Sample Date:		**Restricted Use Soil Cleanup Objectives Protection of Public Health**		**8/16/2005**	**8/16/2005**	**8/16/2005**
Parameter	**Units**	**Industrial** a	**Res. Residential** b			
Volatiles						
1,1,1-Trichloroethane	µg/kg	1000000	100000	9 UJ	14 U	5 U
1,1,2,2-Tetrachloroethane	µg/kg	-	-	9 UJ	14 U	5 U
1,1,2-Trichloroethane	µg/kg	-	-	9 UJ	14 U	5 U
1,1-Dichloroethane	µg/kg	480000	26000	9 UJ	14 U	5 U
1,1-Dichloroethene	µg/kg	1000000	100000	9 UJ	14 U	5 U
1,2,4-Trichlorobenzene	µg/kg	-	-	9 UJ	14 U	5 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	9 UJ	14 U	5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	9 UJ	14 U	5 U
1,2-Dichlorobenzene	µg/kg	1000000	100000	9 UJ	14 U	5 U
1,2-Dichloroethane	µg/kg	60000	3100	9 UJ	14 U	5 U
1,2-Dichloropropane	µg/kg	-	-	9 UJ	14 U	5 U
1,3-Dichlorobenzene	µg/kg	560000	49000	9 UJ	14 U	5 U
1,4-Dichlorobenzene	µg/kg	250000	13000	9 UJ	14 U	5 U
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	18 UJ	78	9 U
2-Hexanone	µg/kg	-	-	18 UJ	28 U	9 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	18 UJ	28 U	9 U
Acetone	µg/kg	1000000	100000	96 J	290	26
Benzene	µg/kg	89000	4800	16 J	2500	3 J
Bromodichloromethane	µg/kg	-	-	9 UJ	14 U	5 U
Bromoform	µg/kg	-	-	9 UJ	14 U	5 U
Bromomethane (Methyl Bromide)	µg/kg	-	-	9 UJ	14 U	5 U
Carbon disulfide	µg/kg	-	-	5 J	240	4 J
Carbon tetrachloride	µg/kg	44000	2400	9 UJ	14 U	5 U
Chlorobenzene	µg/kg	1000000	100000	9 UJ	14 U	5 U
Chloroethane	µg/kg	-	-	9 UJ	14 U	5 U
Chloroform (Trichloromethane)	µg/kg	700000	49000	9 UJ	14 U	5 U
Chloromethane (Methyl Chloride)	µg/kg	-	-	9 UJ	14 U	5 U
cis-1,2-Dichloroethene	µg/kg	1000000	100000	9 UJ	14	5 U
cis-1,3-Dichloropropene	µg/kg	-	-	9 UJ	14 U	5 U
Cyclohexane	µg/kg	-	-	33 J	14 U	12
Dibromochloromethane	µg/kg	-	-	9 UJ	14 U	5 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	9 UJ	14 U	5 U
Ethylbenzene	µg/kg	780000	41000	9 UJ	1900	5 U
Isopropylbenzene	µg/kg	-	-	9 UJ	21	5 U
Methyl acetate	µg/kg	-	-	9 UJ	14 U	5 U
Methyl cyclohexane	µg/kg	-	-	38 J	14 U	24
Methyl Tert Butyl Ether	µg/kg	1000000	100000	9 UJ	14 U	5 U
Methylene chloride	µg/kg	1000000	100000	9 U	14 U	5 U
Styrene	µg/kg	-	-	9 UJ	14 U	5 U
Tetrachloroethene	µg/kg	300000	19000	9 UJ	14 U	5 U
Toluene	µg/kg	1000000	100000	6 J	140	6
trans-1,2-Dichloroethene	µg/kg	1000000	100000	9 UJ	14 U	5 U
trans-1,3-Dichloropropene	µg/kg	-	-	9 UJ	14 U	5 U
Trichloroethene	µg/kg	400000	21000	9 UJ	28	5 U
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	9 UJ	14 U	5 U
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	9 UJ	14 U	5 U
Vinyl chloride	µg/kg	27000	900	9 UJ	14 U	5 U
Xylene (total)	µg/kg	1000000	100000	4 J	770	5
Total VOCs	µg/kg	-	-	198	5981	80

Table 2.4

2005 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				TEST PIT-1	TEST PIT-2	TEST PIT-3
Sample Date:		**Restricted Use Soil Cleanup Objectives Protection of Public Health**		**8/16/2005**	**8/16/2005**	**8/16/2005**
Parameter	**Units**	**Industrial** a	**Res. Residential** b			
Semi-Volatiles						
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	460 U	770 U	410 U
2,4,5-Trichlorophenol	µg/kg	-	-	1200 U	1900 U	1000 U
2,4,6-Trichlorophenol	µg/kg	-	-	460 U	770 U	410 U
2,4-Dichlorophenol	µg/kg	-	-	460 U	770 U	410 U
2,4-Dimethylphenol	µg/kg	-	-	160 J	770 U	410 U
2,4-Dinitrophenol	µg/kg	-	-	1200 U	1900 U	1000 U
2,4-Dinitrotoluene	µg/kg	-	-	460 U	770 U	410 U
2,6-Dinitrotoluene	µg/kg	-	-	460 U	770 U	410 U
2-Chloronaphthalene	µg/kg	-	-	460 U	770 U	410 U
2-Chlorophenol	µg/kg	-	-	460 U	770 U	410 U
2-Methylnaphthalene	µg/kg	-	-	1000	260 J	120 J
2-Methylphenol	µg/kg	1000000	100000	100 J	770 U	410 U
2-Nitroaniline	µg/kg	-	-	1200 U	1900 U	1000 U
2-Nitrophenol	µg/kg	-	-	460 U	770 U	410 U
3,3'-Dichlorobenzidine	µg/kg	-	-	460 U	770 U	410 U
3-Nitroaniline	µg/kg	-	-	1200 U	1900 U	1000 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	1200 U	1900 U	1000 U
4-Bromophenyl phenyl ether	µg/kg	-	-	460 U	770 U	410 U
4-Chloro-3-methylphenol	µg/kg	-	-	460 U	770 U	410 U
4-Chloroaniline	µg/kg	-	-	460 U	770 U	410 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	460 U	770 U	410 U
4-Methylphenol	µg/kg	1000000	100000	260 J	770 U	410 U
4-Nitroaniline	µg/kg	-	-	1200 U	1900 U	1000 U
4-Nitrophenol	µg/kg	-	-	1200 U	1900 U	1000 U
Acenaphthene	µg/kg	1000000	100000	330 J	240 J	410 U
Acenaphthylene	µg/kg	1000000	100000	630	600 J	410 U
Acetophenone	µg/kg	-	-	460 U	770 U	410 U
Anthracene	µg/kg	1000000	100000	1100	320 J	150 J
Atrazine	µg/kg	-	-	460 U	770 U	410 U
Benzaldehyde	µg/kg	-	-	460 UJ	330 J	410 UJ
Benzo(a)anthracene	µg/kg	11000	1000	**2500**[b]	290 J	430
Benzo(a)pyrene	µg/kg	1100	1000	**2300**[ab]	170 J	360 J
Benzo(b)fluoranthene	µg/kg	11000	1000	**2800**[b]	250 J	490
Benzo(g,h,i)perylene	µg/kg	1000000	100000	1800	770 U	240 J
Benzo(k)fluoranthene	µg/kg	110000	3900	800	770 U	170 J
Biphenyl	µg/kg	-	-	340 J	220 J	410 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	460 U	770 U	410 U
bis(2-Chloroethyl)ether	µg/kg	-	-	460 U	770 U	410 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	460 U	770 U	410 U
Butyl benzylphthalate	µg/kg	-	-	460 U	770 U	410 U
Caprolactam	µg/kg	-	-	460 U	770 U	410 U
Carbazole	µg/kg	-	-	380 J	430 J	410 U
Chrysene	µg/kg	110000	3900	2600	290 J	390 J
Dibenz(a,h)anthracene	µg/kg	1100	330	**450 J**[b]	770 U	410 U
Dibenzofuran	µg/kg	1000000	59000	550	580 J	100 J
Diethyl phthalate	µg/kg	-	-	220 J	410 J	230 J
Dimethyl phthalate	µg/kg	-	-	460 U	770 U	410 U
Di-n-butylphthalate	µg/kg	-	-	460 U	770 U	410 U
Di-n-octyl phthalate	µg/kg	-	-	460 U	770 U	410 U
Fluoranthene	µg/kg	1000000	100000	4200	1400	870
Fluorene	µg/kg	1000000	100000	770	920	95 J
Hexachlorobenzene	µg/kg	12000	1200	460 U	770 U	410 U
Hexachlorobutadiene	µg/kg	-	-	460 U	770 U	410 U

Table 2.4

2005 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				TEST PIT-1	TEST PIT-2	TEST PIT-3
Sample Date:				8/16/2005	8/16/2005	8/16/2005
		Restricted Use Soil Cleanup Objectives Protection of Public Health				
Parameter	**Units**	**Industrial**	**Res. Residential**			
		a	b			
Hexachlorocyclopentadiene	µg/kg	-	-	460 U	770 U	410 U
Hexachloroethane	µg/kg	-	-	460 U	770 U	410 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	1400[b]	770 U	210 J
Isophorone	µg/kg	-	-	460 U	770 U	410 U
Naphthalene	µg/kg	1000000	100000	1500	5700	360 J
Nitrobenzene	µg/kg	-	-	460 U	770 U	410 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	460 U	770 U	410 U
N-Nitrosodiphenylamine	µg/kg	-	-	460 U	770 U	410 U
Pentachlorophenol	µg/kg	55000	6700	1200 U	1900 U	1000 U
Phenanthrene	µg/kg	1000000	100000	4300	1900	580
Phenol	µg/kg	1000000	100000	140 J	770 U	410 U
Pyrene	µg/kg	1000000	100000	3900	1000	620
Total PAHs	µg/kg	500000	-	31380	13080	4965
Total SVOCs	µg/kg	-	-	34530	15310	5415
Metals						
Aluminum	mg/kg	-	-	7300	18800	9870
Antimony	mg/kg	-	-	0.46 UJ	0.89 J	0.41 UJ
Arsenic	mg/kg	16	16	6.4	20.6[ab]	3.7
Barium	mg/kg	10000	400	83.7	72.1	90.8
Beryllium	mg/kg	2700	72	2.4 U	4.0 U	2.1 U
Cadmium	mg/kg	60	4.3	0.051 U	12.4[b]	0.046 U
Calcium	mg/kg	-	-	26100	5680	52900
Chromium Total	mg/kg	-	-	12.7	50.9	16.3
Cobalt	mg/kg	-	-	8.0	30.5	13.1
Copper	mg/kg	10000	270	22.0	528[b]	14.7
Iron	mg/kg	-	-	16000	44100	46700
Lead	mg/kg	3900	400	26.5	219	15.6
Magnesium	mg/kg	-	-	6540	3740	12100
Manganese	mg/kg	10000	2000	320	116	908
Mercury	mg/kg	5.7	0.81	0.18	0.30	0.035
Nickel	mg/kg	10000	310	20.0	105	31.8
Potassium	mg/kg	-	-	1390	1350	2070
Selenium	mg/kg	6800	180	1.1 J	5.4 J	0.67 UJ
Silver	mg/kg	6800	180	0.50 U	0.83 U	0.45 U
Sodium	mg/kg	-	-	192	280	177
Thallium	mg/kg	-	-	1.1 J	5.0 J	4.2 J
Vanadium	mg/kg	-	-	26.6	41.0	21.5
Zinc	mg/kg	10000	10000	58.7 J	1920 J	113 J
General Chemistry						
Cyanide (total)	mg/kg	10000	27	3.7	45.1[b]	7.8
Percent Moisture	%	-	-	29.0	56.9	20.3
Total Petroleum Hydrocarbons	mg/kg	-	-	98.6	510	62.7 U

Notes:
- J Estimated
- R Rejected
- U Not present at or above the associated value
- UJ Estimated reporting limit

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	B-1A 9/8/2016 6.5-7.5 ft bgs	B-2 9/8/2016 5-6 ft bgs	B-3 9/8/2016 5-5.4 ft bgs	B-4 9/8/2016 3.5-4.5 ft bgs	B-5 9/8/2016 7-8 ft bgs	B-6 9/9/2016 4-5 ft bgs	B-6 9/9/2016 6-7 ft bgs	B-6B 9/9/2016 2-3 ft bgs	TP-1 9/8/2016 3.5-4.5 ft bgs	TP-3 9/8/2016 2-2.5 ft bgs	TP-4 9/8/2016 4.5-6 ft bgs
Volatile Organic Compounds (VOCs)																
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,1,2-Trichloroethane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,1-Dichloroethane	-	270	240000	480000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,2-Dichloropropane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	-	-	-	-	-	15000 U	8.1 J	-	-	-	9400 U
2-Hexanone	-	-	-	-	µg/kg	-	-	-	-	-	15000 U	33 U	-	-	-	9400 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	-	-	-	-	-	15000 U	33 U	-	-	-	9400 U
Acetone	2200	50	500000	1000000	µg/kg	-	-	-	-	-	15000 U	**63** [b]	-	-	-	9400 U
Benzene	70000	60	44000	89000	µg/kg	-	-	-	-	-	**10000** [b]	0.59 J	-	-	-	**6000** [b]
Bromodichloromethane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Bromoform	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Carbon disulfide	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Carbon tetrachloride	-	760	22000	44000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Chlorobenzene	40000	1100	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Chloroethane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Cyclohexane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	2.3 J	-	-	-	1900 U
Dibromochloromethane	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Ethylbenzene	-	1000	390000	780000	µg/kg	-	-	-	-	-	**190000** [b]	1.6 J	-	-	-	11000
Isopropyl benzene	-	-	-	-	µg/kg	-	-	-	-	-	26000	27	-	-	-	1300 J
Methyl acetate	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	33 U	-	-	-	1900 U
Methyl cyclohexane	-	-	-	-	µg/kg	-	-	-	-	-	3700	4.0 J	-	-	-	1900 U
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Methylene chloride	12000	50	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Styrene	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	2100
Tetrachloroethene	2000	1300	150000	300000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Toluene	36000	700	500000	1000000	µg/kg	-	-	-	-	-	**4700** [b]	1.1 J	-	-	-	**6700** [b]
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Trichloroethene	2000	470	200000	400000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Vinyl chloride	-	20	13000	27000	µg/kg	-	-	-	-	-	3000 U	6.6 U	-	-	-	1900 U
Xylenes (total)	260	1600	500000	1000000	µg/kg	-	-	-	-	-	**210000** [ab]	7.9 J	-	-	-	**27000** [ab]
Semi-volatile Organic Compounds (SVOCs)																
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2,4-Dichlorophenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2,4-Dimethylphenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2,4-Dinitrophenol	-	-	-	-	µg/kg	2800000 U	21000 U	190000 U	42000 U	2000 U	630000 U	53000 U	710000 U	3400 U	100000 U	5300000 U
2,4-Dinitrotoluene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2,6-Dinitrotoluene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2-Chloronaphthalene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2-Chlorophenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2-Methylnaphthalene	-	-	-	-	µg/kg	280000 U	690 J	19000 U	870 J	210 U	600000	5500 U	42000 J	350 U	11000 U	130000 J
2-Methylphenol	-	330	500000	1000000	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
2-Nitroaniline	-	-	-	-	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
2-Nitrophenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
3-Nitroaniline	-	-	-	-	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
4-Chloroaniline	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
4-Methylphenol	-	330	500000	1000000	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
4-Nitroaniline	-	-	-	-	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
4-Nitrophenol	-	-	-	-	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
Acenaphthene	20000	98000	500000	1000000	µg/kg	280000 U	2100 U	4200 J	2200 J	210 U	**640000** [abc]	5500 U	**31000 J** [a]	350 U	11000 U	**87000 J** [a]
Acenaphthylene	-	107000	500000	1000000	µg/kg	280000 U	2100 U	19000 U	1500 J	210 U	**300000** [bc]	5500 U	59000 J	350 U	11000 U	540000 U

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	B-1A 9/8/2016 6.5-7.5 ft bgs	B-2 9/8/2016 5-6 ft bgs	B-3 9/8/2016 5-5.4 ft bgs	B-4 9/8/2016 3.5-4.5 ft bgs	B-5 9/8/2016 7-8 ft bgs	B-6 9/9/2016 4-5 ft bgs	B-6 9/9/2016 6-7 ft bgs	B-6B 9/9/2016 2-3 ft bgs	TP-1 9/8/2016 3.5-4.5 ft bgs	TP-3 9/8/2016 2-2.5 ft bgs	TP-4 9/8/2016 4.5-6 ft bgs
Acetophenone	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Anthracene	-	1000000	500000	1000000	µg/kg	280000 U	2100 U	19000 U	1700 J	210 U	**580000** [c]	5500 U	48000 J	350 U	11000 U	540000 U
Atrazine	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Benzaldehyde	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	280000 U	2100 U	**3800 J** [b]	**4300** [b]	210 U	**400000** [bcd]	5500 U	**130000** [bcd]	210 J	**2200 J** [b]	**71000 J** [bcd]
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	280000 U	2100 U	**2800 J** [acd]	**3700 J** [abcd]	210 U	**340000** [abcd]	5500 U	**130000** [abcd]	170 J	**1900 J** [cd]	540000 U
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	280000 U	2100 U	**4300 J** [b]	**4900** [b]	39 J	**390000** [bcd]	5500 U	**150000** [bcd]	210 J	**2700 J** [b]	540000 U
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	280000 U	2100 U	19000 U	2900 J	29 J	200000	5500 U	89000	130 J	1600 J	540000 U
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	280000 U	2100 U	19000 U	**2200 J** [b]	210 U	**150000** [bcd]	5500 U	**60000 J** [bc]	100 J	11000 U	540000 U
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	130000	5500 U	72000 U	350 U	11000 U	540000 U
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Caprolactam	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Carbazole	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	610 J	210 U	240000	5500 U	72000 U	350 U	11000 U	540000 U
Chrysene	-	1000	56000	110000	µg/kg	280000 U	2100 U	19000 U	**4200 J** [b]	210 U	**400000** [bcd]	5500 U	**130000** [bcd]	180 J	11000 U	540000 U
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	**54000 J** [cd]	5500 U	72000 U	350 U	11000 U	540000 U
Dibenzofuran	-	210000	350000	1000000	µg/kg	280000 U	2100 U	19000 U	1100 J	210 U	**430000** [bc]	5500 U	32000 J	350 U	11000 U	70000 J
Diethyl phthalate	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Dimethyl phthalate	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Fluoranthene	-	100000	500000	1000000	µg/kg	280000 U	2100 U	6900 J	11000	41 J	**1200000** [bcd]	5500 U	**250000** [b]	380	3400 J	**180000 J** [b]
Fluorene	30000	386000	500000	1000000	µg/kg	280000 U	2100 U	19000 U	1600 J	210 U	**590000** [abc]	5500 U	**45000 J** [a]	350 U	11000 U	**88000 J** [a]
Hexachlorobenzene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Hexachlorobutadiene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Hexachloroethane	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	280000 U	2100 U	19000 U	2400 J	210 U	**170000** [bcd]	5500 U	**84000** [bcd]	88 J	1400 J	540000 U
Isophorone	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Naphthalene	-	12000	500000	1000000	µg/kg	**2400000 B** [bcd]	**15000** [b]	19000 U	8200	110 J	**13000000** [bcd]	2100 J	**450000** [b]	350 U	11000 U	**10000000** [bcd]
Nitrobenzene	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Pentachlorophenol	800	800	6700	55000	µg/kg	550000 U	4200 U	37000 U	8400 U	400 U	130000 U	11000 U	140000 U	690 U	21000 U	1100000 U
Phenanthrene	-	1000000	500000	1000000	µg/kg	280000 U	2100 U	4100 J	7400	210 U	**1800000** [bcd]	5500 U	160000	130 J	1900 J	260000 J
Phenol	30000	330	500000	1000000	µg/kg	280000 U	2100 U	19000 U	4300 U	210 U	65000 U	5500 U	72000 U	350 U	11000 U	540000 U
Pyrene	-	1000000	500000	1000000	µg/kg	280000 U	2100 U	5100 J	8600	210 U	**890000** [c]	5500 U	210000	390	2800 J	130000 J
Total PAHs	-	-	500000	500000	µg/kg	**2400000** [cd]	15000	37800	66800	219	**21104000** [cd]	2100	**2026000** [cd]	1988	23100	**10816000** [cd]
Total SVOCs	-	-	-	-	µg/kg	2400000	15690	31200	69380	219	22504000	2100	2100000	1988	17900	11016000

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	B-1A 9/8/2016 6.5-7.5 ft bgs	B-2 9/8/2016 5-6 ft bgs	B-3 9/8/2016 5-5.4 ft bgs	B-4 9/8/2016 3.5-4.5 ft bgs	B-5 9/8/2016 7-8 ft bgs	B-6 9/9/2016 4-5 ft bgs	B-6 9/9/2016 6-7 ft bgs	B-6B 9/9/2016 2-3 ft bgs	TP-1 9/8/2016 3.5-4.5 ft bgs	TP-3 9/8/2016 2-2.5 ft bgs	TP-4 9/8/2016 4.5-6 ft bgs
Pesticides/PCBs																
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
Total PCBs	1	1	1	25	mg/kg	-	-	-	-	-	0.30 U	0.36 U	-	-	-	0.27 U
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Aldrin	140	190	680	1400	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
alpha-BHC	40	20	3400	6800	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
alpha-Chlordane	1300	2900	24000	47000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
beta-BHC	600	90	3000	14000	µg/kg	-	-	-	-	-	440 U	0.83 J	-	-	-	110 U
delta-BHC	40	25	500000	1000000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Dieldrin	6	100	1400	2800	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Endosulfan I	-	102000	200000	920000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Endosulfan II	-	102000	200000	920000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	-	-	-	-	-	330 J	2.7 U	-	-	-	110 U
Endrin	14	60	89000	410000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Endrin aldehyde	-	-	-	-	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Endrin ketone	-	-	-	-	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	-	-	-	-	-	440 U	0.87 J	-	-	-	110 U
gamma-Chlordane	-	-	-	-	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Heptachlor	140	380	15000	29000	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Heptachlor epoxide	-	-	-	-	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	110 U
Methoxychlor	-	-	-	-	µg/kg	-	-	-	-	-	440 U	2.7 U	-	-	-	34 J
Toxaphene	-	-	-	-	µg/kg	-	-	-	-	-	4400 U	27 U	-	-	-	1100 U
Metals																
Aluminum	-	-	-	-	mg/kg	-	-	-	-	-	4990	15500	-	6120	24100	3630
Antimony	-	-	-	-	mg/kg	-	-	-	-	-	18.5 UJ	24.8 UJ	-	30.0 UJ	96.8 UJ	3.1 J
Arsenic	13	16	16	16	mg/kg	-	-	-	-	-	10.2	3.4	-	4.2	11.7 J	6.9
Barium	433	820	400	10000	mg/kg	-	-	-	-	-	85.7	62.9	-	16.0 J	222 J	61.4 J
Beryllium	10	47	590	2700	mg/kg	-	-	-	-	-	0.86	0.69	-	0.25 J	3.1	0.21 J
Cadmium	4	7.5	9.3	60	mg/kg	-	-	-	-	-	0.72	0.19 J	-	0.22 J	2.1	2.5
Calcium	-	-	-	-	mg/kg	-	-	-	-	-	6780	3280	-	2230 U	129000	7620
Chromium	41	-	1500	6800	mg/kg	-	-	-	-	-	11.9	22.6	-	8.5 J	**45.2 J [a]**	**190 J [a]**
Cobalt	-	-	-	-	mg/kg	-	-	-	-	-	5.2	10.1	-	9.7	6.4	13.0
Copper	50	1720	270	10000	mg/kg	-	-	-	-	-	35.2 J	28.5 J	-	15.2 J	**60.9 J [a]**	**100 J [a]**
Iron	-	-	-	-	mg/kg	-	-	-	-	-	11100	19100	-	8570	16900	31800
Lead	63	450	1000	3900	mg/kg	-	-	-	-	-	**207 [a]**	16.2	-	9.1 J	**2030 J [abc]**	**182 J [a]**
Magnesium	-	-	-	-	mg/kg	-	-	-	-	-	1320	5340	-	2100 J	8290 J	1950 J
Manganese	1600	2000	10000	10000	mg/kg	-	-	-	-	-	132	168	-	80.6	1450	376
Mercury	0.18	0.73	2.8	5.7	mg/kg	-	-	-	-	-	**0.95 [ab]**	0.029 U	-	0.041 U	**0.25 [a]**	**1.4 J [ab]**
Nickel	30	130	310	10000	mg/kg	-	-	-	-	-	19.0 J	**33.3 J [a]**	-	18.9 J	**70.8 J [a]**	**143 J [ab]**
Potassium	-	-	-	-	mg/kg	-	-	-	-	-	786	2700	-	1190 J	1900 J	575 J
Selenium	3.9	4	1500	6800	mg/kg	-	-	-	-	-	2.3 J	0.90 J	-	1.7 J	25.8 U	4.8 U
Silver	2	8.3	1500	6800	mg/kg	-	-	-	-	-	0.74 U	0.99 U	-	1.2 U	3.9 U	**3.4 [a]**
Sodium	-	-	-	-	mg/kg	-	-	-	-	-	137 J	81.6 J	-	280 U	1200	168 U
Thallium	-	-	-	-	mg/kg	-	-	-	-	-	0.57 J	9.9 U	-	12.0 U	7.7 U	7.2 U
Vanadium	-	-	-	-	mg/kg	-	-	-	-	-	55.2	28.8	-	21.2 J	16.7 J	14.0 J
Zinc	109	2480	10000	10000	mg/kg	-	-	-	-	-	**132 J [a]**	95.6 J	-	66.3 J	**209 J [a]**	101 J
General Chemistry																
Cyanide (total)	-	40	27	10000	mg/kg	-	-	-	-	-	2.3	1.5 U	-	-	-	4.5 J
Total organic carbon (TOC)	-	-	-	-	mg/kg	-	-	-	-	-	463000 J	43100 J	-	59500	135000	101000

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-4 9/8/2016 4.5-6 ft bgs Duplicate	TP-5 9/8/2016 3-4 ft bgs	TP-6 9/8/2016 3-4 ft bgs	TP-7 9/8/2016 6.7-7.7 ft bgs	TP-8 9/9/2016 3-6.5 ft bgs	TP-9 9/9/2016 4.5-6 ft bgs	TP-9 9/9/2016 4.5-6 ft bgs Duplicate
Volatile Organic Compounds (VOCs)												
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
1,1-Dichloroethane	-	270	240000	480000	µg/kg	2400 U	-	-	-	-	-	-
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	2400 U	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	2400 U	-	-	-	-	-	-
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	2400 U	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	12000 U	-	-	-	-	-	-
2-Hexanone	-	-	-	-	µg/kg	12000 U	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	12000 U	-	-	-	-	-	-
Acetone	2200	50	500000	1000000	µg/kg	12000 U	-	-	-	-	-	-
Benzene	70000	60	44000	89000	µg/kg	**6400** [b]	-	-	-	-	-	-
Bromodichloromethane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Bromoform	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Carbon disulfide	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Carbon tetrachloride	-	760	22000	44000	µg/kg	2400 U	-	-	-	-	-	-
Chlorobenzene	40000	1100	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
Chloroethane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	2400 U	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Cyclohexane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Ethylbenzene	-	1000	390000	780000	µg/kg	11000	-	-	-	-	-	-
Isopropyl benzene	-	-	-	-	µg/kg	1200 J	-	-	-	-	-	-
Methyl acetate	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
Methylene chloride	12000	50	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
Styrene	-	-	-	-	µg/kg	3000	-	-	-	-	-	-
Tetrachloroethene	2000	1300	150000	300000	µg/kg	2400 U	-	-	-	-	-	-
Toluene	36000	700	500000	1000000	µg/kg	**6500** [b]	-	-	-	-	-	-
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	2400 U	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Trichloroethene	2000	470	200000	400000	µg/kg	2400 U	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	2400 U	-	-	-	-	-	-
Vinyl chloride	-	20	13000	27000	µg/kg	2400 U	-	-	-	-	-	-
Xylenes (total)	260	1600	500000	1000000	µg/kg	**28000** [ab]	-	-	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)												
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2,4-Dichlorophenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2,4-Dimethylphenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	2000 J
2,4-Dinitrophenol	-	-	-	-	µg/kg	4300000 U	2200 U	2100 U	2500000 U	240000 U	100000 U	77000 U
2,4-Dinitrotoluene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2,6-Dinitrotoluene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2-Chloronaphthalene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2-Chlorophenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2-Methylnaphthalene	-	-	-	-	µg/kg	110000 J	50 J	220 U	330000	10000 J	10000 U	2000 J
2-Methylphenol	-	330	500000	1000000	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
2-Nitroaniline	-	-	-	-	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
2-Nitrophenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
3-Nitroaniline	-	-	-	-	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
4-Chloroaniline	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
4-Methylphenol	-	330	500000	1000000	µg/kg	850000 U	44 J	420 U	490000 U	47000 U	**2200 J** [b]	2300 J
4-Nitroaniline	-	-	-	-	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
4-Nitrophenol	-	-	-	-	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
Acenaphthene	20000	98000	500000	1000000	µg/kg	**85000 J** [a]	220 U	220 U	**410000** [ab]	24000 U	10000 U	7900 U
Acenaphthylene	-	107000	500000	1000000	µg/kg	440000 U	220 U	220 U	69000 J	14000 J	10000 U	7900 U

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-4 9/8/2016 4.5-6 ft bgs Duplicate	TP-5 9/8/2016 3-4 ft bgs	TP-6 9/8/2016 3-4 ft bgs	TP-7 9/8/2016 6.7-7.7 ft bgs	TP-8 9/9/2016 3-6.5 ft bgs	TP-9 9/9/2016 4.5-6 ft bgs	TP-9 9/9/2016 4.5-6 ft bgs Duplicate
Acetophenone	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Anthracene	-	1000000	500000	1000000	µg/kg	440000 U	220 U	220 U	170000 J	10000 J	10000 U	7900 U
Atrazine	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Benzaldehyde	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	**44000 J [bcd]**	220 U	220 U	**250000 [bcd]**	**24000 [bcd]**	10000 U	7900 U
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	440000 U	220 U	35 J	**200000 J [abcd]**	**22000 J [acd]**	10000 U	7900 U
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	440000 U	37 J	52 J	**230000 [bcd]**	**23000 J [bcd]**	10000 U	7900 U
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	440000 U	220 U	220 U	110000 J	15000 J	10000 U	7900 U
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	440000 U	220 U	220 U	**110000 J [bc]**	**6700 J [b]**	10000 U	7900 U
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	440000 U	220 U	220 U	76000 J	24000 U	10000 U	7900 U
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	8600 J	5900 J
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Caprolactam	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Carbazole	-	-	-	-	µg/kg	440000 U	220 U	220 U	88000 J	24000 U	10000 U	7900 U
Chrysene	-	1000	56000	110000	µg/kg	440000 U	220 U	220 U	**190000 J [bcd]**	**28000 [b]**	10000 U	7900 U
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Dibenzofuran	-	210000	350000	1000000	µg/kg	54000 J	220 U	220 U	**270000 [b]**	3100 J	10000 U	7900 U
Diethyl phthalate	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Dimethyl phthalate	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Fluoranthene	-	100000	500000	1000000	µg/kg	89000 J	33 J	58 J	**800000 [bc]**	41000	3500 J	2100 J
Fluorene	30000	386000	500000	1000000	µg/kg	**64000 J [a]**	220 U	220 U	**390000 [ab]**	8700 J	10000 U	1700 J
Hexachlorobenzene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Hexachlorobutadiene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Hexachloroethane	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	440000 U	220 U	220 U	**93000 J [bc]**	**14000 J [bcd]**	10000 U	7900 U
Isophorone	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Naphthalene	-	12000	500000	1000000	µg/kg	**10000000 [bcd]**	3000	65 J	**2700000 [bcd]**	**16000 J [b]**	10000 U	2400 J
Nitrobenzene	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Pentachlorophenol	800	800	6700	55000	µg/kg	850000 U	430 U	420 U	490000 U	47000 U	20000 U	15000 U
Phenanthrene	-	1000000	500000	1000000	µg/kg	150000 J	48 J	48 J	**1300000 [bcd]**	45000	9000 J	7900
Phenol	30000	330	500000	1000000	µg/kg	440000 U	220 U	220 U	250000 U	24000 U	10000 U	7900 U
Pyrene	-	1000000	500000	1000000	µg/kg	66000 J	44 J	61 J	610000	46000	2600 J	1700 J
Total PAHs	-	-	500000	500000	µg/kg	**10498000 [cd]**	3162	319	**7632000 [cd]**	313400	15100	15800
Total SVOCs	-	-	-	-	µg/kg	10662000	3256	319	8396000	326500	25900	28000

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-4 9/8/2016 4.5-6 ft bgs Duplicate	TP-5 9/8/2016 3-4 ft bgs	TP-6 9/8/2016 3-4 ft bgs	TP-7 9/8/2016 6.7-7.7 ft bgs	TP-8 9/9/2016 3-6.5 ft bgs	TP-9 9/9/2016 4.5-6 ft bgs	TP-9 9/9/2016 4.5-6 ft bgs Duplicate
Pesticides/PCBs												
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
Total PCBs	1	1	1	25	mg/kg	0.25 U	-	-	-	-	-	-
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	210 U	-	-	-	-	-	-
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	210 U	-	-	-	-	-	-
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	210 U	-	-	-	-	-	-
Aldrin	140	190	680	1400	µg/kg	210 U	-	-	-	-	-	-
alpha-BHC	40	20	3400	6800	µg/kg	210 U	-	-	-	-	-	-
alpha-Chlordane	1300	2900	24000	47000	µg/kg	210 U	-	-	-	-	-	-
beta-BHC	600	90	3000	14000	µg/kg	210 U	-	-	-	-	-	-
delta-BHC	40	25	500000	1000000	µg/kg	210 U	-	-	-	-	-	-
Dieldrin	6	100	1400	2800	µg/kg	210 U	-	-	-	-	-	-
Endosulfan I	-	102000	200000	920000	µg/kg	210 U	-	-	-	-	-	-
Endosulfan II	-	102000	200000	920000	µg/kg	210 U	-	-	-	-	-	-
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	210 U	-	-	-	-	-	-
Endrin	14	60	89000	410000	µg/kg	210 U	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	µg/kg	210 U	-	-	-	-	-	-
Endrin ketone	-	-	-	-	µg/kg	210 U	-	-	-	-	-	-
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	210 U	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	µg/kg	210 U	-	-	-	-	-	-
Heptachlor	140	380	15000	29000	µg/kg	210 U	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	µg/kg	210 U	-	-	-	-	-	-
Methoxychlor	-	-	-	-	µg/kg	100 J	-	-	-	-	-	-
Toxaphene	-	-	-	-	µg/kg	2100 U	-	-	-	-	-	-
Metals												
Aluminum	-	-	-	-	mg/kg	3700	8320	21700	9260	15600	17800	6020
Antimony	-	-	-	-	mg/kg	9.1 J	37.6 UJ	2.7 J	2.2 J	2.9 J	84.4 UJ	0.98 J
Arsenic	13	16	16	16	mg/kg	11.1	**40.4** [abcd]	5.8	13.0	**22.3** [abcd]	**22.6 J** [abcd]	7.2 J
Barium	433	820	400	10000	mg/kg	55.6 J	253 J	159 J	44.7 J	256	116 J	64.8
Beryllium	10	47	590	2700	mg/kg	0.26	1.5	1.2	0.67	0.95	0.59	0.39
Cadmium	4	7.5	9.3	60	mg/kg	2.6	3.3	0.95	2.2	0.40	**7.1** [a]	**8.9** [a]
Calcium	-	-	-	-	mg/kg	4130	12200	23600	3770	13700	22100	13600
Chromium	41	-	1500	6800	mg/kg	**181 J** [a]	29.0 J	**67.8 J** [a]	25.3 J	39.7	**550 J** [a]	**123 J** [a]
Cobalt	-	-	-	-	mg/kg	10.7	23.8	16.4	9.3	9.5	12.5 J	3.8 J
Copper	50	1720	270	10000	mg/kg	**171 J** [a]	31.4 J	**58.7 J** [a]	**326 J** [ac]	**201 J** [a]	**901 J** [ac]	138 J
Iron	-	-	-	-	mg/kg	25900	147000	34000	23100	34900	210000 J	50800 J
Lead	63	450	1000	3900	mg/kg	**81.7 J** [a]	**170 J** [a]	45.1 J	**573 J** [ab]	**729** [ab]	**302 J** [a]	**395** [a]
Magnesium	-	-	-	-	mg/kg	1860 J	1900 J	8130 J	2450 J	1490	1340 J	1120
Manganese	1600	2000	10000	10000	mg/kg	278	**12000** [abcd]	495	119	346	**2820** [ab]	1400
Mercury	0.18	0.73	2.8	5.7	mg/kg	**5.3 J** [abc]	0.046	0.16	**0.24** [a]	**6.5** [abcd]	**0.30** [a]	0.15
Nickel	30	130	310	10000	mg/kg	**164 J** [ab]	**35.2 J** [a]	**123 J** [a]	**30.8 J** [a]	**45.3 J** [a]	**182 J** [ab]	**38.8 J** [a]
Potassium	-	-	-	-	mg/kg	435 J	2270 J	3880 J	1450 J	1440	613 J	557
Selenium	3.9	4	1500	6800	mg/kg	2.3 J	**4.5 J** [ab]	0.79 J	2.2 J	2.9 J	1.6 J	1.2 J
Silver	2	8.3	1500	6800	mg/kg	1.4	1.5 U	0.75 U	0.34 J	0.43 J	1.3 J	1.9
Sodium	-	-	-	-	mg/kg	184 U	351 U	176 U	217 U	1060	248	179
Thallium	-	-	-	-	mg/kg	5.7 J	7.5 U	7.5 U	9.3 U	2.5 J	6.8 U	6.7 U
Vanadium	-	-	-	-	mg/kg	11.3 J	40.6 J	41.1 J	22.3 J	535	21.4 J	8.8
Zinc	109	2480	10000	10000	mg/kg	**203 J** [a]	**962 J** [a]	**115 J** [a]	**754 J** [a]	73.1 J	**773 J** [a]	**1250 J** [a]
General Chemistry												
Cyanide (total)	-	40	27	10000	mg/kg	1.4 J	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	mg/kg	131000	53400	51300 J	36500 J	281000 J	79300	90100

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-10 9/8/2016 7-8 ft bgs	TP-11B 9/9/2016 8-9 ft bgs	TP-12 9/9/2016 10-11 ft bgs	TP-13 9/8/2016 6-8 ft bgs	TP-14 9/8/2016 4-4.9 ft bgs	TP-15 9/8/2016 4-5 ft bgs	TP-16 09/28/2016 14-14.5 ft. bgs.	TP-17 09/28/2016 8-8.5 ft. bgs.	TP-18 09/28/2016 9-9.5 ft. bgs.	TP-19 09/28/2016 5-5.5 ft. bgs.
Volatile Organic Compounds (VOCs)															
1,1,1-Trichloroethane	-	680	500000	1000000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	270	240000	480000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	-	330	500000	1000000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	-	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	1100	500000	1000000	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	10000	20	30000	60000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	2400	280000	560000	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	20000	1800	130000	250000	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	100000	120	500000	1000000	µg/kg	30 UJ	-	-	-	-	-	-	-	-	-
2-Hexanone	-	-	-	-	µg/kg	30 U	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	-	µg/kg	30 U	-	-	-	-	-	-	-	-	-
Acetone	2200	50	500000	1000000	µg/kg	44 U	-	-	-	-	-	-	-	-	-
Benzene	70000	60	44000	89000	µg/kg	9.9 J	-	-	-	-	-	-	-	-	-
Bromodichloromethane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Bromoform	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	-	-	-	µg/kg	4.6 J	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	760	22000	44000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Chlorobenzene	40000	1100	500000	1000000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	12000	370	350000	700000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	250	500000	1000000	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	1000	390000	780000	µg/kg	0.48 J	-	-	-	-	-	-	-	-	-
Isopropyl benzene	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Methyl acetate	-	-	-	-	µg/kg	30 U	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	-	930	500000	1000000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Methylene chloride	12000	50	500000	1000000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Styrene	-	-	-	-	µg/kg	0.35 J	-	-	-	-	-	-	-	-	-
Tetrachloroethene	2000	1300	150000	300000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Toluene	36000	700	500000	1000000	µg/kg	1.1 J	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	-	190	500000	1000000	µg/kg	6.1 UJ	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Trichloroethene	2000	470	200000	400000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	-	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Vinyl chloride	-	20	13000	27000	µg/kg	6.1 U	-	-	-	-	-	-	-	-	-
Xylenes (total)	260	1600	500000	1000000	µg/kg	2.5 J	-	-	-	-	-	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2,4,5-Trichlorophenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2,4,6-Trichlorophenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2,4-Dichlorophenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2,4-Dimethylphenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2,4-Dinitrophenol	-	-	-	-	µg/kg	2300000 U	100000 U	2000 U	2100 U	9400 U	10000 U	18000 U	11000 U	43000 U	40000 U
2,4-Dinitrotoluene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2,6-Dinitrotoluene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2-Chloronaphthalene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2-Chlorophenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2-Methylnaphthalene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	290 J	10000	270 J	4400 U	5600
2-Methylphenol	-	330	500000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
2-Nitroaniline	-	-	-	-	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
2-Nitrophenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
3,3'-Dichlorobenzidine	-	-	-	-	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
3-Nitroaniline	-	-	-	-	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
4,6-Dinitro-2-methylphenol	-	-	-	-	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
4-Bromophenyl phenyl ether	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
4-Chloro-3-methylphenol	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
4-Chloroaniline	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
4-Chlorophenyl phenyl ether	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
4-Methylphenol	-	330	500000	1000000	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
4-Nitroaniline	-	-	-	-	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
4-Nitrophenol	-	-	-	-	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
Acenaphthene	20000	98000	500000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	380 J	1100 U	5800	300 J	4400 U	4600
Acenaphthylene	-	107000	500000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	960 U	660 J	1800 U	1100 U	4400 U	4100 U

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-10 9/8/2016 7-8 ft bgs	TP-11B 9/9/2016 8-9 ft bgs	TP-12 9/9/2016 10-11 ft bgs	TP-13 9/8/2016 6-8 ft bgs	TP-14 9/8/2016 4-4.9 ft bgs	TP-15 9/8/2016 4-5 ft bgs	TP-16 09/28/2016 14-14.5 ft. bgs.	TP-17 09/28/2016 8-8.5 ft. bgs.	TP-18 09/28/2016 9-9.5 ft. bgs.	TP-19 09/28/2016 5-5.5 ft. bgs.
Acetophenone	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Anthracene	-	1000000	500000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	1100	480 J	1800 U	1100 U	4400 U	4500
Atrazine	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Benzaldehyde	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Benzo(a)anthracene	-	1000	5600	11000	µg/kg	240000 U	10000 U	96 J	220 U	**1700** [b]	**1400** [b]	1800 U	1100 U	4400 U	**4300** [b]
Benzo(a)pyrene	2600	22000	1000	1100	µg/kg	240000 U	10000 U	100 J	220 U	**1200** [cd]	**1400** [cd]	1800 U	1100 U	4400 U	**2100 J** [cd]
Benzo(b)fluoranthene	-	1700	5600	11000	µg/kg	240000 U	10000 U	140 J	220 U	**1900** [b]	1600	1800 U	1100 U	710 J	**3400 J** [b]
Benzo(g,h,i)perylene	-	1000000	500000	1000000	µg/kg	240000 U	10000 U	79 J	220 U	660 J	1200	1800 U	1100 U	4400 U	1000 J
Benzo(k)fluoranthene	-	1700	56000	110000	µg/kg	240000 U	10000 U	52 J	220 U	960 U	660 J	1800 U	1100 U	4400 U	1400 J
Biphenyl (1,1-Biphenyl)	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	970 J	1100 U	4400 U	1000 J
bis(2-Chloroethoxy)methane	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
bis(2-Chloroethyl)ether	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
bis(2-Ethylhexyl)phthalate (DEHP)	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Butyl benzylphthalate (BBP)	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Caprolactam	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Carbazole	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	480 J	1100 U	1800 U	1100 U	4400 U	7200
Chrysene	-	1000	56000	110000	µg/kg	240000 U	10000 U	120 J	220 U	**1700** [b]	**1700** [b]	**1100 J** [b]	1100 U	4400 U	**4500** [b]
Dibenz(a,h)anthracene	-	1000000	560	1100	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Dibenzofuran	-	210000	350000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	280 J	1100 U	1300 J	1100 U	4400 U	2800 J
Diethyl phthalate	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Dimethyl phthalate	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Di-n-butylphthalate (DBP)	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	890 J	1100 U	4400 U	4100 U
Fluoranthene	-	100000	500000	1000000	µg/kg	240000 U	2100 J	180 J	220 U	3400	2300	3700	340 J	1100 J	15000
Fluorene	30000	386000	500000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	600 J	340 J	3000	290 J	4400 U	6500
Hexachlorobenzene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Hexachlorobutadiene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Hexachlorocyclopentadiene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Hexachloroethane	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Indeno(1,2,3-cd)pyrene	-	8200	5600	11000	µg/kg	240000 U	10000 U	70 J	220 U	590 J	970 J	1800 U	1100 U	4400 U	820 J
Isophorone	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Naphthalene	-	12000	500000	1000000	µg/kg	**3000000 B** [bcd]	10000 U	110 J	220 U	960 U	1100 U	**1200000** [bcd]	3200	800 J	12000
Nitrobenzene	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
N-Nitrosodi-n-propylamine	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
N-Nitrosodiphenylamine	-	-	-	-	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Pentachlorophenol	800	800	6700	55000	µg/kg	470000 U	20000 U	400 U	420 U	1900 U	2000 U	3500 U	2100 U	8600 U	8000 U
Phenanthrene	-	1000000	500000	1000000	µg/kg	240000 U	1900 J	140 J	220 U	4000	2200	5800	470 J	650 J	24000
Phenol	30000	330	500000	1000000	µg/kg	240000 U	10000 U	210 U	220 U	960 U	1100 U	1800 U	1100 U	4400 U	4100 U
Pyrene	-	1000000	500000	1000000	µg/kg	240000 U	2000 J	160 J	220 U	2800	2600	3000	290 J	990 J	11000
Total PAHs	-	-	500000	500000	µg/kg	**3000000** [cd]	6000	1247	54	20320	18170	**1222400** [cd]	4890	4250	95120
Total SVOCs	-	-	-	-	µg/kg	3000000	6000	1247	0	20790	17800	1235560	5160	4250	111720

Table 2.5

2016 Subsurface Soil Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	a Part 375-6.8(b) Protection of Ecol	b Part 375-6.8(b) Protection of GW	c Part 375-6.8(b) Commercial SCOs	d Part 375-6.8(b) Industrial SCOs	Units	TP-10 9/8/2016 7-8 ft bgs	TP-11B 9/9/2016 8-9 ft bgs	TP-12 9/9/2016 10-11 ft bgs	TP-13 9/8/2016 6-8 ft bgs	TP-14 9/8/2016 4-4.9 ft bgs	TP-15 9/8/2016 4-5 ft bgs	TP-16 09/28/2016 14-14.5 ft. bgs.	TP-17 09/28/2016 8-8.5 ft. bgs.	TP-18 09/28/2016 9-9.5 ft. bgs.	TP-19 09/28/2016 5-5.5 ft. bgs.
Pesticides/PCBs															
Aroclor-1016 (PCB-1016)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
Total PCBs	1	1	1	25	mg/kg	0.31 U	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.0000033	14000	92000	180000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
4,4'-DDE	0.0000033	17000	62000	120000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.0000033	136000	47000	94000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Aldrin	140	190	680	1400	µg/kg	23 U	-	-	-	-	-	-	-	-	-
alpha-BHC	40	20	3400	6800	µg/kg	23 U	-	-	-	-	-	-	-	-	-
alpha-Chlordane	1300	2900	24000	47000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
beta-BHC	600	90	3000	14000	µg/kg	10 J	-	-	-	-	-	-	-	-	-
delta-BHC	40	25	500000	1000000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Dieldrin	6	100	1400	2800	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Endosulfan I	-	102000	200000	920000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Endosulfan II	-	102000	200000	920000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	1000000	200000	920000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Endrin	14	60	89000	410000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	µg/kg	23 U	-	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	6000	100	9200	23000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Heptachlor	140	380	15000	29000	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Methoxychlor	-	-	-	-	µg/kg	23 U	-	-	-	-	-	-	-	-	-
Toxaphene	-	-	-	-	µg/kg	230 U	-	-	-	-	-	-	-	-	-
Metals															
Aluminum	-	-	-	-	mg/kg	16100	10500	15800	10500	1330	16900	8820	23300	8310	4060
Antimony	-	-	-	-	mg/kg	2.0 J	3.7 J	1.6 J	1.2 J	3.4 J	0.85 J	35.9 U	17.6 U	18.7 U	19.2 U
Arsenic	13	16	16	16	mg/kg	9.4	11.5	4.9	3.4	7.8	5.0	35.6	3.5	4.9	1.0 J
Barium	433	820	400	10000	mg/kg	104 J	111 J	87.7 J	52.7 J	33.7 J	115 J	466	282	89.7	52.1
Beryllium	10	47	590	2700	mg/kg	1.2	0.89	0.97	0.50	0.16 J	1.8	0.98	0.91	0.35	0.089 J
Cadmium	4	7.5	9.3	60	mg/kg	0.46	**4.3** [a]	0.26 J	0.23 J	0.22 J	0.32	1.9	0.34	0.98	4.1
Calcium	-	-	-	-	mg/kg	65200	27600	45300	27600	1840 U	68700	21700	28100	10900	1300
Chromium	41	-	1500	6800	mg/kg	**89.1 J** [a]	**114 J** [a]	19.5 J	14.8 J	11.1 J	15.3 J	95.8	30.5	39.4	98.0
Cobalt	-	-	-	-	mg/kg	9.0	9.8	9.9	7.8	2.2	44.8	9.9	15.1	6.0	2.0
Copper	50	1720	270	10000	mg/kg	**52.9 J** [a]	**133 J** [a]	19.1 J	22.4 J	**52.0 J** [a]	17.1 J	75.7	24.1	114	2140
Iron	-	-	-	-	mg/kg	30900	40500	21800	14100	18400	16700	56300	30100	16000	11900
Lead	63	450	1000	3900	mg/kg	43.8 J	**242 J** [a]	17.2 J	35.6 J	**70.1 J** [a]	37.2 J	18.5	15.8	95.7	75.7
Magnesium	-	-	-	-	mg/kg	7880 J	3690 J	12800 J	17200 J	469 J	16100 J	3450	10800	5320	460
Manganese	1600	2000	10000	10000	mg/kg	255	1170	600	178	83.3	927	443	417	178	180
Mercury	0.18	0.73	2.8	5.7	mg/kg	0.076	0.096	**0.22** [a]	0.15	0.048	0.16	0.40	0.044	0.74	0.024 U
Nickel	30	130	310	10000	mg/kg	24.6 J	**39.5 J** [a]	22.9 J	18.7 J	14.4 J	24.0 J	92.4	48.9	21.0	67.0
Potassium	-	-	-	-	mg/kg	3280 J	1020 J	3820 J	1760 J	250 J	3000 J	1330	6890	1860	674
Selenium	3.9	4	1500	6800	mg/kg	5.9 U	5.1 U	5.3 U	5.0 U	1.3 J	4.7 U	4.7 J	4.7 U	5.0 U	5.1 U
Silver	2	8.3	1500	6800	mg/kg	0.89 U	0.73 J	0.80 U	0.75 U	0.73 U	0.71 U	3.3	0.70 U	0.45 J	1.2
Sodium	-	-	-	-	mg/kg	207 U	253	190 U	191 U	170 U	340	344	246	119 J	96.0 J
Thallium	-	-	-	-	mg/kg	8.9 U	7.7 U	8.0 U	7.5 U	7.3 U	7.1 U	1.5 J	7.0 U	7.5 U	7.7 U
Vanadium	-	-	-	-	mg/kg	70.7 J	16.2 J	89.6 J	19.7 J	4.9 J	273 J	25.8	44.6	18.6	6.8
Zinc	109	2480	10000	10000	mg/kg	91.0 J	**583 J** [a]	64.0 J	84.3 J	73.6 J	68.1 J	57.0	60.6	286	231
General Chemistry															
Cyanide (total)	-	40	27	10000	mg/kg	**272** [bc]	-	-	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	mg/kg	126000	57800	39800 J	15800 J	467000	24900 J	229000 J	43400	12300	26500

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.6

1993 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				01	02	03	04	05
Sample Date:		Restricted Use Soil Cleanup Objectives Protection of Public Health		7/1/1993	7/1/1993	7/1/1993	7/1/1993	7/1/1993
Parameter	Units	Industrial a	Res. Residential b					
Volatiles								
1,1,1-Trichloroethane	µg/kg	1000000	100000	-	-	-	-	-
1,2-Dichloroethene (total)	µg/kg	-	-	3 J	3 J	3 J	2 J	1 J
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	13 U	18	10 J	56	23
Benzene	µg/kg	89000	4800	3 J	5 J	7 J	19 U	3 J
Carbon disulfide	µg/kg	-	-	3 J	14 U	14 U	19 U	10 U
Chloroform (Trichloromethane)	µg/kg	700000	49000	1 J	0.8 J	0.4 J	19 U	10 U
Ethylbenzene	µg/kg	780000	41000	2 J	0.8 J	3 J	1 J	0.9 J
Methylene chloride	µg/kg	1000000	100000	-	-	-	-	-
Styrene	µg/kg	-	-	0.9 J	0.4 J	0.9 J	0.3 J	0.4 J
Tetrachloroethene	µg/kg	300000	19000	0.5 J	14 U	14 U	19 U	10 U
Toluene	µg/kg	1000000	100000	3 J	3 J	4 J	2 J	2 J
Trichloroethene	µg/kg	400000	21000	2 J	1 J	1 J	1 J	0.9 J
Xylene (total)	µg/kg	1000000	100000	4 J	3 J	11 J	2 J	3 J
Total VOCs	µg/kg	-	-	22.4	35	40.3	64.3	34.2
Semi-Volatiles								
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/kg	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/kg	-	-	-	-	-	-	-
2-Chlorophenol	µg/kg	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	-	-	110 J	5200	3200 J	7200	NA
2-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-
2-Nitroaniline	µg/kg	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/kg	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/kg	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-
4-Nitroaniline	µg/kg	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	-	-	-	-	-	-	-
Acenaphthene	µg/kg	1000000	100000	560	11000	9200	21000	NA
Acenaphthylene	µg/kg	1000000	100000	530	18000	14000	34000	NA
Acetophenone	µg/kg	-	-	-	-	-	-	-
Anthracene	µg/kg	1000000	100000	270	31000	27000	100000	NA
Atrazine	µg/kg	-	-	-	-	-	-	-
Benzaldehyde	µg/kg	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	11000	1000	3600[b]	90000[ab]	70000[ab]	180000[ab]	NA
Benzo(a)pyrene	µg/kg	1100	1000	2000[ab]	74000[ab]	62000[ab]	160000[ab]	NA

Table 2.6

1993 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				01	02	03	04	05
Sample Date:				7/1/1993	7/1/1993	7/1/1993	7/1/1993	7/1/1993
		Restricted Use Soil Cleanup Objectives Protection of Public Health						
Parameter	Units	Industrial	Res. Residential					
		a	b					
Benzo(b)fluoranthene	µg/kg	11000	1000	7400[b]	95000[ab]	88000[ab]	230000[ab]	NA
Benzo(g,h,i)perylene	µg/kg	1000000	100000	500 U	17000	13000	30000	NA
Benzo(k)fluoranthene	µg/kg	110000	3900	2300	21000[b]	19000[b]	75000[b]	NA
Biphenyl	µg/kg	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/kg	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/kg	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	570	1200 J	1400 J	1100 J	NA
Butyl benzylphthalate	µg/kg	-	-	-	-	-	-	-
Caprolactam	µg/kg	-	-	-	-	-	-	-
Carbazole	µg/kg	-	-	1200	8700	6800	13000	NA
Chrysene	µg/kg	110000	3900	3400	67000[b]	38000[b]	160000[ab]	NA
Dibenz(a,h)anthracene	µg/kg	1100	330	220 J	5500[ab]	3500 J[ab]	9900[ab]	NA
Dibenzofuran	µg/kg	1000000	59000	390 J	18000	12000	32000	NA
Diethyl phthalate	µg/kg	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/kg	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/kg	-	-	-	-	-	-	-
Fluoranthene	µg/kg	1000000	100000	12000	170000[b]	130000[b]	390000[b]	NA
Fluorene	µg/kg	1000000	100000	760	35000	22000	93000	NA
Hexachlorobenzene	µg/kg	12000	1200	-	-	-	-	-
Hexachlorobutadiene	µg/kg	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	1100[b]	22000[ab]	16000[ab]	61000[ab]	NA
Isophorone	µg/kg	-	-	-	-	-	-	-
Naphthalene	µg/kg	1000000	100000	300 J	23000	18000	40000	NA
Nitrobenzene	µg/kg	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/kg	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/kg	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	55000	6700	-	-	-	-	-
Phenanthrene	µg/kg	1000000	100000	8600	180000[b]	110000[b]	400000[b]	NA
Phenol	µg/kg	1000000	100000	500 U	4900 U	4900 U	430 J	NA
Pyrene	µg/kg	1000000	100000	7900	160000[b]	120000[b]	350000[b]	NA
Total PAHs	µg/kg	500000	-	50940	1019500[a]	759700[a]	2333900[a]	-
Total SVOCs	µg/kg	-	-	53210	1052600	783100	2387630	-
General Chemistry								
Cyanide (total)	mg/kg	10000	27	0.0019 U	NA	NA	NA	NA
Oil and Grease	mg/kg	-	-	-	-	-	-	-
Percent Moisture	%	-	-	-	-	-	-	-

Notes:

J	Estimated
NA	Not analyzed
U	Not present at or above the associated value
*	High quantifiable limits due to dilution
- -	Not applicable

Table 2.7

2005 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				RIVER-1	RIVER-2	RIVER-2	RIVER-3
Sample Date:		Restricted Use Soil Cleanup Objectives Protection of Public Health		8/17/2005	8/17/2005	8/17/2005 Duplicate	8/17/2005
Parameter	Units	Industrial a	Res. Residential b				
Semi-Volatiles							
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4,5-Trichlorophenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
2,4,6-Trichlorophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4-Dichlorophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4-Dimethylphenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4-Dinitrophenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
2,4-Dinitrotoluene	µg/kg	-	-	440 U	420 U	430 U	540 U
2,6-Dinitrotoluene	µg/kg	-	-	440 U	420 U	430 U	540 U
2-Chloronaphthalene	µg/kg	-	-	440 U	420 U	430 U	540 U
2-Chlorophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2-Methylnaphthalene	µg/kg	-	-	1500	420 U	430 U	540 U
2-Methylphenol	µg/kg	1000000	100000	440 U	420 U	430 U	540 U
2-Nitroaniline	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
2-Nitrophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
3,3'-Dichlorobenzidine	µg/kg	-	-	440 U	420 U	430 U	540 U
3-Nitroaniline	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
4-Bromophenyl phenyl ether	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Chloro-3-methylphenol	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Chloroaniline	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Methylphenol	µg/kg	1000000	100000	440 U	420 U	430 U	130 J
4-Nitroaniline	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
4-Nitrophenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
Acenaphthene	µg/kg	1000000	100000	3100 J	420 U	430 U	540 U
Acenaphthylene	µg/kg	1000000	100000	4900	420 U	430 U	540 U
Acetophenone	µg/kg	-	-	110 J	420 U	430 U	540 U
Anthracene	µg/kg	1000000	100000	8700	420 U	430 U	540 U
Atrazine	µg/kg	-	-	440 U	420 U	430 U	540 U
Benzaldehyde	µg/kg	-	-	440 U	420 U	430 U	540 U
Benzo(a)anthracene	µg/kg	11000	1000	24000[ab]	160 J	160 J	220 J
Benzo(a)pyrene	µg/kg	1100	1000	23000[ab]	210 J	210 J	260 J
Benzo(b)fluoranthene	µg/kg	11000	1000	26000[ab]	300 J	310 J	300 J
Benzo(g,h,i)perylene	µg/kg	1000000	100000	4700 J	140 J	140 J	190 J
Benzo(k)fluoranthene	µg/kg	110000	3900	9300[b]	130 J	430 U	200 J
Biphenyl	µg/kg	-	-	780	420 U	430 U	540 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	440 U	420 U	430 U	540 U
bis(2-Chloroethyl)ether	µg/kg	-	-	440 U	420 U	430 U	540 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	330 J	110 J	430 U	290 J
Butyl benzylphthalate	µg/kg	-	-	440 U	420 U	430 U	540 U
Caprolactam	µg/kg	-	-	440 U	420 U	430 U	540 U
Carbazole	µg/kg	-	-	1800	420 U	430 U	540 U
Chrysene	µg/kg	110000	3900	22000[b]	160 J	180 J	310 J

Table 2.7

2005 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Sample Location:				RIVER-1	RIVER-2	RIVER-2	RIVER-3
Sample Date:		Restricted Use Soil Cleanup Objectives Protection of Public Health		8/17/2005	8/17/2005	8/17/2005 Duplicate	8/17/2005
Parameter	Units	Industrial a	Res. Residential b				
Dibenz(a,h)anthracene	µg/kg	1100	330	1400 J[ab]	420 U	430 U	540 U
Dibenzofuran	µg/kg	1000000	59000	3900	420 U	430 U	540 U
Diethyl phthalate	µg/kg	-	-	4000	3900 J	170 J	5000
Dimethyl phthalate	µg/kg	-	-	440 U	420 U	430 U	540 U
Di-n-butylphthalate	µg/kg	-	-	230 J	120 J	430 U	180 J
Di-n-octyl phthalate	µg/kg	-	-	440 U	420 U	430 U	540 U
Fluoranthene	µg/kg	1000000	100000	54000	190 J	300 J	650
Fluorene	µg/kg	1000000	100000	5900	420 U	430 U	540 U
Hexachlorobenzene	µg/kg	12000	1200	440 U	420 U	430 U	540 U
Hexachlorobutadiene	µg/kg	-	-	440 U	420 U	430 U	540 U
Hexachlorocyclopentadiene	µg/kg	-	-	440 U	420 U	430 U	540 U
Hexachloroethane	µg/kg	-	-	440 U	420 U	430 U	540 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	4800 J[b]	120 J	120 J	160 J
Isophorone	µg/kg	-	-	440 U	420 U	430 U	540 U
Naphthalene	µg/kg	1000000	100000	10000	420 U	430 U	540 U
Nitrobenzene	µg/kg	-	-	440 U	420 U	430 U	540 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	440 U	420 U	430 U	540 U
N-Nitrosodiphenylamine	µg/kg	-	-	440 U	420 U	430 U	540 U
Pentachlorophenol	µg/kg	55000	6700	1100 U	1100 U	1100 U	1400 U
Phenanthrene	µg/kg	1000000	100000	37000	420 U	95 J	330 J
Phenol	µg/kg	1000000	100000	140 J	420 U	430 U	540 U
Pyrene	µg/kg	1000000	100000	41000	160 J	260 J	490 J
Total PAHs	µg/kg	500000	-	279800	1570	1775	3110
Total SVOCs	µg/kg	-	-	292590	5700	1945	8710
General Chemistry							
Percent Moisture	%	-	-	25.4	22.2	22.6	38.7

Notes:

J Estimated
U Not present at or above the associated value

Table 2.8

2009 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Location ID:			SP-1		SP-1		SP-1		SP-1		SP-2		SP-3		SP-3		SP-3		SP-4		SP-4		SP-4	
Sample Date:			10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009	
Depth:			0-0.5 ft BGS		1-1.5 ft BGS		2-2.5 ft BGS		3.5-4 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		1-1.5 ft BGS		2-2.5 ft BGS		0-0.5 ft BGS		1-1.5 ft BGS		2-2.5 ft BGS	
Parameters	**Units**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	
Semivolatile Organic Compounds																								
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
2,4,5-Trichlorophenol	µg/kg	3.24	3900 U	12.3	440 U	13.7	430 U	6.4	420 U	3.24	900 U	3.24	460 U	12.3	46000 U	13.7	17000 U	3.24	2300 U	12.3	3500 U	13.7	540 U	
2,4,6-Trichlorophenol	µg/kg	3.24	3900 U	12.3	440 U	13.7	430 U	6.4	420 U	3.24	900 U	3.24	460 U	12.3	46000 U	13.7	17000 U	3.24	2300 U	12.3	3500 U	13.7	540 U	
2,4-Dichlorophenol	µg/kg	3.24	3900 U	12.3	440 U	13.7	430 U	6.4	420 U	3.24	900 U	3.24	460 U	12.3	46000 U	13.7	17000 U	3.24	2300 U	12.3	3500 U	13.7	540 U	
2,4-Dimethylphenol	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
2,4-Dinitrophenol	µg/kg	NC	20000 U	NC	2300 U	NC	2200 U	NC	2200 U	NC	4600 U	NC	2400 U	NC	240000 U	NC	90000 U	NC	12000 U	NC	18000 U	NC	2800 U	
2,4-Dinitrotoluene	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
2,6-Dinitrotoluene	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
2-Chloronaphthalene	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
2-Chlorophenol	µg/kg	3.24	3900 U	12.3	440 U	13.7	430 U	6.4	420 U	3.24	900 U	3.24	460 U	12.3	46000 U	13.7	17000 U	3.24	2300 U	12.3	3500 U	13.7	540 U	
2-Methylnaphthalene	µg/kg	NC	3900 U	NC	50 J	NC	430 U	NC	420 U	NC	220 J	NC	99 J	NC	9800 J	NC	3500 J	NC	570 J	NC	880 J	NC	200 J	
2-Methylphenol	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
2-Nitroaniline	µg/kg	NC	20000 U	NC	2300 U	NC	2200 U	NC	2200 U	NC	4600 U	NC	2400 U	NC	240000 U	NC	90000 U	NC	12000 U	NC	18000 U	NC	2800 U	
2-Nitrophenol	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
3&4-Methylphenol	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
3,3'-Dichlorobenzidine	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
3-Nitroaniline	µg/kg	NC	20000 U	NC	2300 U	NC	2200 U	NC	2200 U	NC	4600 U	NC	2400 U	NC	240000 U	NC	90000 U	NC	12000 U	NC	18000 U	NC	2800 U	
4,6-Dinitro-2-methylphenol	µg/kg	NC	20000 U	NC	2300 U	NC	2200 U	NC	2200 U	NC	4600 U	NC	2400 U	NC	240000 U	NC	90000 U	NC	12000 U	NC	18000 U	NC	2800 U	
4-Bromophenyl phenyl ether	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
4-Chloro-3-methylphenol	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
4-Chloroaniline	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
4-Chlorophenyl phenyl ether	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
4-Nitroaniline	µg/kg	NC	20000 U	NC	2300 U	NC	2200 U	NC	2200 U	NC	4600 U	NC	2400 U	NC	240000 U	NC	90000 U	NC	12000 U	NC	18000 U	NC	2800 U	
4-Nitrophenol	µg/kg	NC	20000 U	NC	2300 U	NC	2200 U	NC	2200 U	NC	4600 U	NC	2400 U	NC	240000 U	NC	90000 U	NC	12000 U	NC	18000 U	NC	2800 U	
Acenaphthene	µg/kg	756	3400 J	2070	600	3206	180 J	1484	58 J	756	800 J	756	210 J	2070	42000 J	3206	10000 J	756	1400 J	2070	4600	3206	130 J	
Acenaphthylene	µg/kg	NC	3500 J	NC	100 J	NC	430 U	NC	420 U	NC	1200	NC	310 J	NC	57000	NC	13000 J	NC	1500 J	NC	3200 J	NC	110 J	
Acetophenone	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Anthracene	µg/kg	578	6900	2194	550	2450	430 U	1134	91 J	578	1800	578	310 J	2194	120000	2450	34000	578	3100	2194	12000	2450	190 J	
Atrazine	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Benzaldehyde	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Benzo(a)anthracene	µg/kg	64.8	12000	246	430 J	275	72 J	127	150 J	64.8	3700	64.8	780	246	150000	275	49000	64.8	5800	246	12000	275	390 J	
Benzo(a)pyrene	µg/kg	7.0	12000	26.7	370 J	29.8	430 U	13.8	140 J	7.0	3600	7.0	820	26.7	140000	29.8	46000	7.0	5500	26.7	10000	29.8	330 J	
Benzo(b)fluoranthene	µg/kg	NC	9900	NC	270 J	NC	430 U	NC	110 J	NC	3200	NC	730	NC	110000	NC	38000	NC	4500	NC	8300	NC	340 J	
Benzo(g,h,i)perylene	µg/kg	NC	8400	NC	270 J	NC	430 U	NC	420 U	NC	2700	NC	700	NC	100000	NC	31000	NC	3600	NC	6500	NC	230 J	
Benzo(k)fluoranthene	µg/kg	NC	8400	NC	270 J	NC	430 U	NC	99 J	NC	2400	NC	660	NC	78000	NC	28000	NC	3800	NC	8100	NC	320 J	
Biphenyl (1,1-Biphenyl)	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
bis(2-Chloroethoxy)methane	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
bis(2-Chloroethyl)ether	µg/kg	0.5	3900 U	0.62	440 U	0.69	430 U	0.5	420 U	0.5	900 U	0.5	460 U	0.62	46000 U	0.69	17000 U	0.5	2300 U	0.62	3500 U	0.69	540 U	
bis(2-Ethylhexyl)phthalate	µg/kg	1080	3900 U	4090	440 U	4569	430 U	2115	420 U	1080	900 U	1080	83 J	4090	46000 U	4569	17000 U	1080	2300 U	4090	3500 U	4569	540 U	
Butyl benzylphthalate	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Caprolactam	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Carbazole	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	230 J	NC	87 J	NC	12000 J	NC	3400 J	NC	490 J	NC	3500 U	NC	540 U	
Chrysene	µg/kg	NC	12000	NC	430 J	NC	79 J	NC	180 J	NC	3400	NC	820	NC	150000	NC	48000	NC	5700	NC	12000	NC	490 J	
Dibenz(a,h)anthracene	µg/kg	NC	1900 J	NC	66 J	NC	430 U	NC	420 U	NC	640 J	NC	160 J	NC	24000 J	NC	7400 J	NC	860 J	NC	2000 J	NC	540 U	
Dibenzofuran	µg/kg	NC	2700 J	NC	99 J	NC	430 U	NC	420 U	NC	680 J	NC	220 J	NC	54000	NC	13000 J	NC	1400 J	NC	2100 J	NC	540 U	
Diethyl phthalate	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Dimethyl phthalate	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Di-n-butylphthalate	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Di-n-octyl phthalate	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Fluoranthene	µg/kg	5508	34000	20910	1400	23360	140 J	10810	410 J	5508	9400	5508	2000	20910	470000	23360	140000	5508	15000	20910	27000	23360	1000	
Fluorene	µg/kg	43.2	5500	164	650	183	430 U	84.8	78 J	43.2	1500	43.2	300 J	164	100000	183	25000	43.2	2600	164	5600	183	150 J	
Hexachlorobenzene	µg/kg	0.81	3900 U	3.08	440 U	3.44	430 U	1.59	420 U	0.81	900 U	0.81	460 U	3.08	46000 U	3.44	17000 U	0.81	2300 U	3.08	3500 U	3.44	540 U	
Hexachlorobutadiene	µg/kg	1.62	3900 U	6.15	440 U	6.87	430 U	3.18	420 U	1.62	900 U	1.62	460 U	6.15	46000 U	6.87	17000 U	1.62	2300 U	6.15	3500 U	6.87	540 U	
Hexachlorocyclopentadiene	µg/kg	23.8	3900 U	90.2	440 U	101	430 U	46.6	420 U	23.8	900 U	23.8	460 U	90.2	46000 U	101	17000 U	23.8	2300 U	90.2	3500 U	101	540 U	
Hexachloroethane	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Indeno(1,2,3-cd)pyrene	µg/kg	NC	6800	NC	230 J	NC	430 U	NC	91 J	NC	2200	NC	570	NC	85000	NC	27000	NC	3100	NC	5800	NC	210 J	
Isophorone	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Naphthalene	µg/kg	162	1800 J	615	180 J	687	430 U	318	420 U	162	910	162	680	615	22000 J	687	15000 J	162	2100 J	615	4100	687	370 J	
Nitrobenzene	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
N-Nitrosodi-n-propylamine	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
N-Nitrosodiphenylamine	µg/kg	NC	3900 U	NC	440 U	NC	430 U	NC	420 U	NC	900 U	NC	460 U	NC	46000 U	NC	17000 U	NC	2300 U	NC	3500 U	NC	540 U	
Pentachlorophenol	µg/kg	216	20000 U	820	2300 U	916	2200 U	424	2200 U	216	4600 U	216	2400 U	820	240000 U	916	90000 U	216	12000 U	820	18000 U	916	2800 U	
Phenanthrene	µg/kg	648	32000	2460	3000	2748	83 J	1272	420 J	648	7900	648	1200	2460	580000	2748	150000	648	14000	2460	25000	2748	630	
Phenol	µg/kg	5.0	3900 U	10.3	440 U	11.5	430 U	5.3	420 U	5.0	900 U	5.0	460 U	10.3	46000 U	11.5	17000 U	5.0	2300 U	10.3	3500 U	11.5	540 U	
Pyrene	µg/kg	5190	27000	19700	1300	22000	130 J	10190	340 J	5190	7700	5190	1500	19700	340000	22000	110000	5190	14000	19700	21000	22000	790	
Total PAHs	µg/kg		185500		10116		684		2167		53050		11750		2568000		771400		86560		167200		5680	
Total SVOCs	µg/kg		188200		10265		684		2167		54180		12239		2643800		791300		89020		170180		5880	
Wet Chemistry																								
Total Solids	%		68.3		74.6		77.3		78.6		73.2		71.3		72.1		75.9		72.0		75.5		61.2	

Table 2.8

2009 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Location ID:		SP-4		SP-5		SP-5		SP-5		SP-6		SP-7		SP-8		SP-9		SP-10		SP-10		SP-10	
Sample Date:		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009		10/6/2009	
Depth:		3.5-4 ft BGS		0-0.5 ft BGS		1-1.5 ft BGS		2-2.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		1-1.5 ft BGS		2-2.5 ft BGS	
Parameters	**Units**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**
Semivolatile Organic Compounds																							
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
2,4,5-Trichlorophenol	µg/kg	6.4	490 U	3.24	1400 U	12.3	460 U	13.7	450 U	10.6	14000 U	10.6	48000 U	10.6	460 U	10.6	9200 U	10.6	62000 U	43.4	1200 U	8.9	9500 U
2,4,6-Trichlorophenol	µg/kg	6.4	490 U	3.24	1400 U	12.3	460 U	13.7	450 U	10.6	14000 U	10.6	48000 U	10.6	460 U	10.6	9200 U	10.6	62000 U	43.4	1200 U	8.9	9500 U
2,4-Dichlorophenol	µg/kg	6.4	490 U	3.24	1400 U	12.3	460 U	13.7	450 U	10.6	14000 U	10.6	48000 U	10.6	460 U	10.6	9200 U	10.6	62000 U	43.4	1200 U	8.9	9500 U
2,4-Dimethylphenol	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
2,4-Dinitrophenol	µg/kg	NC	2500 U	NC	7100 U	NC	2400 U	NC	2300 U	NC	74000 U	NC	250000 U	NC	2400 U	NC	47000 U	NC	320000 U	NC	6400 U	NC	49000 U
2,4-Dinitrotoluene	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
2,6-Dinitrotoluene	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
2-Chloronaphthalene	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
2-Chlorophenol	µg/kg	6.4	490 U	3.24	1400 U	12.3	460 U	13.7	450 U	10.6	14000 U	10.6	48000 U	10.6	460 U	10.6	9200 U	10.6	62000 U	43.4	1200 U	8.9	9500 U
2-Methylnaphthalene	µg/kg	NC	110 J	NC	270 J	NC	170 J	NC	160 J	NC	7600 J	NC	32000 J	NC	290 J	NC	3400 J	NC	34000 J	NC	860 J	NC	4700 J
2-Methylphenol	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
2-Nitroaniline	µg/kg	NC	2500 U	NC	7100 U	NC	2400 U	NC	2300 U	NC	74000 U	NC	250000 U	NC	2400 U	NC	47000 U	NC	320000 U	NC	6400 U	NC	49000 U
2-Nitrophenol	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
3&4-Methylphenol	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
3,3'-Dichlorobenzidine	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
3-Nitroaniline	µg/kg	NC	2500 U	NC	7100 U	NC	2400 U	NC	2300 U	NC	74000 U	NC	250000 U	NC	2400 U	NC	47000 U	NC	320000 U	NC	6400 U	NC	49000 U
4,6-Dinitro-2-methylphenol	µg/kg	NC	2500 U	NC	7100 U	NC	2400 U	NC	2300 U	NC	74000 U	NC	250000 U	NC	2400 U	NC	47000 U	NC	320000 U	NC	6400 U	NC	49000 U
4-Bromophenyl phenyl ether	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
4-Chloro-3-methylphenol	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
4-Chloroaniline	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
4-Chlorophenyl phenyl ether	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
4-Nitroaniline	µg/kg	NC	2500 U	NC	7100 U	NC	2400 U	NC	2300 U	NC	74000 U	NC	250000 U	NC	2400 U	NC	47000 U	NC	320000 U	NC	6400 U	NC	49000 U
4-Nitrophenol	µg/kg	NC	2500 U	NC	7100 U	NC	2400 U	NC	2300 U	NC	74000 U	NC	250000 U	NC	2400 U	NC	47000 U	NC	320000 U	NC	6400 U	NC	49000 U
Acenaphthene	µg/kg	1484	290 J	756	**910 J**	2070	510	3206	170 J	2464	**6900 J**	2464	**43000 J**	2464	570	2464	**8600 J**	2464	**36000 J**	10120	4000	2070	**10000**
Acenaphthylene	µg/kg	NC	190 J	NC	1000 J	NC	220 J	NC	150 J	NC	11000 J	NC	42000 J	NC	940	NC	3600 J	NC	45000 J	NC	2300	NC	6500 J
Acetophenone	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Anthracene	µg/kg	1134	410 J	578	**1600**	2194	640	2450	320 J	1883	**25000**	1883	**110000**	1883	1100	1883	**14000**	1883	**130000**	7740	2000	1584	**23000**
Atrazine	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Benzaldehyde	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Benzo(a)anthracene	µg/kg	127	**610**	64.8	**3300**	246	**1200**	275	**600**	211	**50000**	211	**170000**	211	**2700**	211	**27000**	211	**230000**	868	**4400**	178	**40000**
Benzo(a)pyrene	µg/kg	13.8	**530**	7.0	**3500**	26.7	**910**	29.8	**590**	22.9	**51000**	22.9	**160000**	22.9	**2900**	22.9	**26000**	22.9	**230000**	94	**4400**	19.2	**38000**
Benzo(b)fluoranthene	µg/kg	NC	490 J	NC	2800	NC	870	NC	500	NC	44000	NC	130000	NC	2500	NC	23000	NC	200000	NC	3900	NC	34000
Benzo(g,h,i)perylene	µg/kg	NC	360 J	NC	2600	NC	570	NC	440 J	NC	37000	NC	110000	NC	2300	NC	19000	NC	160000	NC	3100	NC	23000
Benzo(k)fluoranthene	µg/kg	NC	450 J	NC	2200	NC	810	NC	490	NC	39000	NC	120000	NC	2200	NC	21000	NC	170000	NC	3500	NC	30000
Biphenyl (1,1-Biphenyl)	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	13000 J	NC	120 J	NC	9200 U	NC	62000 U	NC	1200 U	NC	2200 J
bis(2-Chloroethoxy)methane	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
bis(2-Chloroethyl)ether	µg/kg	0.5	490 U	0.5	1400 U	0.62	460 U	0.69	450 U	0.53	14000 U	0.53	48000 U	0.53	460 U	0.53	9200 U	0.53	62000 U	2.17	1200 U	0.5	9500 U
bis(2-Ethylhexyl)phthalate	µg/kg	2115	490 U	1080	1400 U	4090	110 J	4569	98 J	3511	14000 U	3511	48000 U	3511	110 J	3511	9200 U	3511	62000 U	14420	270 J	2950	9500 U
Butyl benzylphthalate	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Caprolactam	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Carbazole	µg/kg	NC	110 J	NC	280 J	NC	240 J	NC	450 U	NC	4700 J	NC	20000 J	NC	270 J	NC	2800 J	NC	21000 J	NC	500 J	NC	3600 J
Chrysene	µg/kg	NC	640	NC	3200	NC	1300	NC	660	NC	48000	NC	160000	NC	2700	NC	25000	NC	220000	NC	4400	NC	37000
Dibenz(a,h)anthracene	µg/kg	NC	490 U	NC	620 J	NC	200 J	NC	130 J	NC	8700 J	NC	24000 J	NC	550	NC	4500 J	NC	34000 J	NC	840 J	NC	5200 J
Dibenzofuran	µg/kg	NC	100 J	NC	850 J	NC	120 J	NC	76 J	NC	13000 J	NC	67000	NC	670	NC	7600 J	NC	64000	NC	1000 J	NC	11000
Diethyl phthalate	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Dimethyl phthalate	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Di-n-butylphthalate	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Di-n-octyl phthalate	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Fluoranthene	µg/kg	10810	1700	5508	**8800**	20910	2900	23360	1400	17950	**130000**	17950	**490000**	17950	6900	17950	**68000**	17950	**620000**	73750	10000	15100	**110000**
Fluorene	µg/kg	84.8	**250 J**	43.2	**1600**	164	**380 J**	183	130 J	141	**24000**	141	**120000**	141	**950**	141	**14000**	141	**120000**	578	**1400**	118	**22000**
Hexachlorobenzene	µg/kg	1.59	490 U	0.81	1400 U	3.08	460 U	3.44	450 U	2.64	14000 U	2.64	48000 U	2.64	460 U	2.64	9200 U	2.64	62000 U	10.8	1200 U	2.18	9500 U
Hexachlorobutadiene	µg/kg	3.18	490 U	1.62	1400 U	6.15	460 U	6.87	450 U	5.28	14000 U	5.28	48000 U	5.28	460 U	5.28	9200 U	5.28	62000 U	21.7	1200 U	5.36	9500 U
Hexachlorocyclopentadiene	µg/kg	46.6	490 U	23.8	1400 U	90.2	460 U	101	450 U	77.4	14000 U	77.4	48000 U	77.4	460 U	77.4	9200 U	77.4	62000 U	318	1200 U	65.1	9500 U
Hexachloroethane	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Indeno(1,2,3-cd)pyrene	µg/kg	NC	330 J	NC	2100	NC	510	NC	380 J	NC	30000	NC	90000	NC	1900	NC	15000	NC	130000	NC	2800	NC	19000
Isophorone	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Naphthalene	µg/kg	318	200 J	162	**1500**	615	**670**	687	**1600**	528	**37000**	528	**78000**	528	**2000**	528	**19000**	528	**94000**	2169	**9700**	444	**14000**
Nitrobenzene	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
N-Nitrosodi-n-propylamine	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
N-Nitrosodiphenylamine	µg/kg	NC	490 U	NC	1400 U	NC	460 U	NC	450 U	NC	14000 U	NC	48000 U	NC	460 U	NC	9200 U	NC	62000 U	NC	1200 U	NC	9500 U
Pentachlorophenol	µg/kg	424	2500 U	216	7100 U	820	2400 U	916	2300 U	704	74000 U	704	250000 U	704	2400 U	704	47000 U	704	320000 U	2892	6400 U	592	49000 U
Phenanthrene	µg/kg	1272	**1300**	648	**6500**	2460	2100	2748	930	2112	**130000**	2112	**610000**	2112	**4600**	2112	**71000**	2112	**680000**	8676	6600	1776	**120000**
Phenol	µg/kg	5.3	490 U	5.0	1400 U	10.3	460 U	11.5	450 U	8.8	14000 U	8.8	48000 U	8.8	460 U	8.8	9200 U	8.8	62000 U	36.2	1200 U	7.4	9500 U
Pyrene	µg/kg	10190	1100	5190	**6900**	19700	2100	22000	1000	16910	**130000**	16910	**480000**	16910	5100	16910	**72000**	16910	**650000**	69480	8000	14220	**110000**
Total PAHs	µg/kg		8850		49130		15890		9490		801600		2937000		39910		430700		3749000		71340		641700
Total SVOCs	µg/kg		9170		50530		16530		9824		826900		3069000		41370		444500		3868000		73970		663200
Wet Chemistry																							
Total Solids	%		67.9		71.6		71.0		74.0		64.6		69.2		71.7		71.8		53.4		53.2		69.8

Table 2.8

2009 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Location ID:			**SP-10**		**SP-11**		**SP-13**		**SP-13**		**SP-13**
Sample Date:			**10/6/2009**		**10/6/2009**		**10/6/2009**		**10/6/2009**		**10/6/2009**
Depth:			**3.5-4 ft BGS**		**0-0.5 ft BGS**		**0-0.5 ft BGS**		**0.5-1 ft BGS**		**1-1.5 ft BGS**
Parameters	**Units**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**	**Limit**	**Concentration**
Semivolatile Organic Compounds											
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
2,4,5-Trichlorophenol	µg/kg	1	440 U	10.6	14000 U	130	5600 U	209	6700 U	41.5	9900 U
2,4,6-Trichlorophenol	µg/kg	1	440 U	10.6	14000 U	130	5600 U	209	6700 U	41.5	9900 U
2,4-Dichlorophenol	µg/kg	1	440 U	10.6	14000 U	130	5600 U	209	6700 U	41.5	9900 U
2,4-Dimethylphenol	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
2,4-Dinitrophenol	µg/kg	NC	2300 U	NC	71000 U	NC	29000 U	NC	34000 U	NC	51000 U
2,4-Dinitrotoluene	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
2,6-Dinitrotoluene	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
2-Chloronaphthalene	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
2-Chlorophenol	µg/kg	1	440 U	10.6	14000 U	130	5600 U	209	6700 U	41.5	9900 U
2-Methylnaphthalene	µg/kg	NC	440 U	NC	14000 U	NC	940 J	NC	2900 J	NC	4700 J
2-Methylphenol	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
2-Nitroaniline	µg/kg	NC	2300 U	NC	71000 U	NC	29000 U	NC	34000 U	NC	51000 U
2-Nitrophenol	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
3&4-Methylphenol	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
3,3'-Dichlorobenzidine	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
3-Nitroaniline	µg/kg	NC	2300 U	NC	71000 U	NC	29000 U	NC	34000 U	NC	51000 U
4,6-Dinitro-2-methylphenol	µg/kg	NC	2300 U	NC	71000 U	NC	29000 U	NC	34000 U	NC	51000 U
4-Bromophenyl phenyl ether	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
4-Chloro-3-methylphenol	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
4-Chloroaniline	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
4-Chlorophenyl phenyl ether	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
4-Nitroaniline	µg/kg	NC	2300 U	NC	71000 U	NC	29000 U	NC	34000 U	NC	51000 U
4-Nitrophenol	µg/kg	NC	2300 U	NC	71000 U	NC	29000 U	NC	34000 U	NC	51000 U
Acenaphthene	µg/kg	164	**1400**	2464	**8700 J**	303800	2600 J	48720	2700 J	9688	**36000**
Acenaphthylene	µg/kg	NC	440 U	NC	7300 J	NC	2400 J	NC	5200 J	NC	32000
Acetophenone	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Anthracene	µg/kg	125	440 U	1883	**29000**	23220	5000 J	37240	8200	7404	**43000**
Atrazine	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Benzaldehyde	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Benzo(a)anthracene	µg/kg	14	440 U	211	**50000**	2604	**18000**	4176	**24000**	830	**45000**
Benzo(a)pyrene	µg/kg	1.52	440 U	22.9	**47000**	282	**20000**	452	**29000**	90	**41000**
Benzo(b)fluoranthene	µg/kg	NC	440 U	NC	41000	NC	19000	NC	26000	NC	33000
Benzo(g,h,i)perylene	µg/kg	NC	440 U	NC	33000	NC	16000	NC	22000	NC	26000
Benzo(k)fluoranthene	µg/kg	NC	440 U	NC	34000	NC	14000	NC	21000	NC	29000
Biphenyl (1,1-Biphenyl)	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
bis(2-Chloroethoxy)methane	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
bis(2-Chloroethyl)ether	µg/kg	0.5	440 U	0.53	14000 U	6.51	5600 U	10.4	6700 U	2.08	9900 U
bis(2-Ethylhexyl)phthalate	µg/kg	233	440 U	3511	14000 U	43290	1100 J	69430	6700 U	13800	9900 U
Butyl benzylphthalate	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Caprolactam	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Carbazole	µg/kg	NC	440 U	NC	14000 U	NC	990 J	NC	2200 J	NC	26000
Chrysene	µg/kg	NC	440 U	NC	48000	NC	17000	NC	25000	NC	37000
Dibenz(a,h)anthracene	µg/kg	NC	440 U	NC	7200 J	NC	3500 J	NC	5300 J	NC	6400 J
Dibenzofuran	µg/kg	NC	440 U	NC	8100 J	NC	1400 J	NC	3100 J	NC	50000
Diethyl phthalate	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Dimethyl phthalate	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Di-n-butylphthalate	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Di-n-octyl phthalate	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Fluoranthene	µg/kg	1190	110 J	17950	**150000**	221300	40000	69480	56000	70580	**140000**
Fluorene	µg/kg	9.4	440 U	141	**22000**	1736	**2400 J**	2784	**4100 J**	554	**70000**
Hexachlorobenzene	µg/kg	0.18	440 U	2.64	14000 U	32.6	5600 U	52.2	6700 U	10.4	9900 U
Hexachlorobutadiene	µg/kg	0.35	440 U	5.28	14000 U	65.1	5600 U	104	6700 U	20.8	9900 U
Hexachlorocyclopentadiene	µg/kg	5.15	440 U	77.4	14000 U	955	5600 U	1531	6700 U	304	9900 U
Hexachloroethane	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Indeno(1,2,3-cd)pyrene	µg/kg	NC	440 U	NC	27000	NC	12000	NC	18000	NC	22000
Isophorone	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Naphthalene	µg/kg	35.1	440 U	528	**2700 J**	6510	4300 J	10440	**13000**	2076	**47000**
Nitrobenzene	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
N-Nitrosodi-n-propylamine	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
N-Nitrosodiphenylamine	µg/kg	NC	440 U	NC	14000 U	NC	5600 U	NC	6700 U	NC	9900 U
Pentachlorophenol	µg/kg	46.8	2300 U	704	71000 U	8680	29000 U	13920	34000 U	2768	51000 U
Phenanthrene	µg/kg	140	110 J	2112	**130000**	26040	19000	414760	31000	8304	**100000**
Phenol	µg/kg	5.0	440 U	8.8	14000 U	109	5600 U	174	**850 J**	34.6	9900 U
Pyrene	µg/kg	1124	85 J	16910	**150000**	208500	39000	334400	44000	66500	**96000**
Total PAHs	µg/kg		1705		786900		234200		334500		803400
Total SVOCs	µg/kg		1705		795000		238630		343550		884100
Wet Chemistry											
Total Solids	%		75.3		71.6		58.5		49.5		66.7

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID:	SR-1	SR-1	SR-1	SR-2	SR-2	SR-2	SR-3	SR-3	SR-3
					Sample Date:	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
					Depth:	0-0.5 ft bgs	1.5-2 ft bgs	2.5-3 ft bgs	0-0.5 ft bgs	1.5-2 ft bgs	2.5-3 ft bgs	0-0.5 ft bgs	1.5-2 ft bgs	2.5-3 ft bgs
Volatile Organic Compounds (VOCs)														
1,1,1-Trichloroethane	<1900	1900-3500	>3500	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,1,2,2-Tetrachloroethane	<2800	2800-5400	>5400	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,1,2-Trichloroethane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,1-Dichloroethane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,1-Dichloroethene	<520	520-4700	>4700	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,2,4-Trichlorobenzene	<35000	35000-55000	>55000	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,2-Dichlorobenzene	<280	280-2500	>2500	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,2-Dichloroethane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,2-Dichloropropane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,3-Dichlorobenzene	<1800	1800-7100	>7100	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
1,4-Dichlorobenzene	<720	720-3300	>3300	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	-	µg/kg	-	-	-	27 U	-	-	-	-	-	
2-Hexanone	-	-	-	µg/kg	-	-	-	27 U	-	-	-	-	-	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	µg/kg	-	-	-	27 U	-	-	-	-	-	
Acetone	-	-	-	µg/kg	-	-	-	36	-	-	-	-	-	
Benzene	<530	530-1900	>1900	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Bromodichloromethane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Bromoform	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Bromomethane (Methyl bromide)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Carbon disulfide	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Carbon tetrachloride	<1070	1070-9600	>9600	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Chlorobenzene	<200	200-1700	>1700	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Chloroethane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Chloroform (Trichloromethane)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Chloromethane (Methyl chloride)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
cis-1,2-Dichloroethene	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
cis-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Cyclohexane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Dibromochloromethane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Dichlorodifluoromethane (CFC-12)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Ethylbenzene	<430	430-3700	>3700	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Isopropyl benzene	<210	210-1800	>1800	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Methyl acetate	-	-	-	µg/kg	-	-	-	10 J	-	-	-	-	-	
Methyl cyclohexane	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Methyl tert butyl ether (MTBE)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Methylene chloride	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Styrene	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Tetrachloroethene	<16000	16000-57000	>57000	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Toluene	<930	930-4500	>4500	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
trans-1,2-Dichloroethene	<1200	1200-11000	>11000	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
trans-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Trichloroethene	<1800	1800-8600	>8600	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Trichlorofluoromethane (CFC-11)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Trifluorotrichloroethane (CFC-113)	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Vinyl chloride	-	-	-	µg/kg	-	-	-	5.5 U	-	-	-	-	-	
Xylenes (total)	<590	590-5200	>5200	µg/kg	-	-	-	11 U	-	-	-	-	-	
Semi-volatile Organic Compounds (SVOCs)														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2,4,5-Trichlorophenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2,4,6-Trichlorophenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2,4-Dichlorophenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2,4-Dimethylphenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2,4-Dinitrophenol	-	-	-	µg/kg	2300 U	2200 U	2200 U	11000 U	11000 U	11000 U	23000 U	2200 U	2200 U	
2,4-Dinitrotoluene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2,6-Dinitrotoluene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2-Chloronaphthalene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2-Chlorophenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2-Methylnaphthalene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2-Methylphenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	
2-Nitroaniline	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U	
2-Nitrophenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U	

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-1 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-1 9/21/2016 1.5-2 ft bgs	SR-1 9/21/2016 2.5-3 ft bgs	SR-2 9/21/2016 0-0.5 ft bgs	SR-2 9/21/2016 1.5-2 ft bgs	SR-2 9/21/2016 2.5-3 ft bgs	SR-3 9/21/2016 0-0.5 ft bgs	SR-3 9/21/2016 1.5-2 ft bgs	SR-3 9/21/2016 2.5-3 ft bgs
3,3'-Dichlorobenzidine	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
3-Nitroaniline	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
4,6-Dinitro-2-methylphenol	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
4-Bromophenyl phenyl ether	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
4-Chloro-3-methylphenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
4-Chloroaniline	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
4-Chlorophenyl phenyl ether	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
4-Methylphenol	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
4-Nitroaniline	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
4-Nitrophenol	-	-	-	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
Acenaphthene	-	-	-	µg/kg	230 U	230 U	220 U	200 J	1100 U	1100 U	3800	86 J	100 J
Acenaphthylene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2000 J	100 J	99 J
Acetophenone	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Anthracene	-	-	-	µg/kg	61 J	230 U	220 U	1100 U	1100 U	1100 U	8500	260	200 J
Atrazine	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Benzaldehyde	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Benzo(a)anthracene	-	-	-	µg/kg	130 J	230 U	220 U	770 J	1100 U	580 J	11000	570	570
Benzo(a)pyrene	-	-	-	µg/kg	99 J	230 U	220 U	710 J	180 J	560 J	9800	520	590
Benzo(b)fluoranthene	-	-	-	µg/kg	140 J	230 U	220 U	820 J	230 J	620 J	11000	460	610
Benzo(g,h,i)perylene	-	-	-	µg/kg	61 J	230 U	220 U	470 J	1100 U	350 J	6700	420	470
Benzo(k)fluoranthene	-	-	-	µg/kg	54 J	230 U	220 U	480 J	1100 U	240 J	4800	410	350
Biphenyl (1,1-Biphenyl)	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
bis(2-Chloroethoxy)methane	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
bis(2-Chloroethyl)ether	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
bis(2-Ethylhexyl)phthalate (DEHP)	<360000	>360000	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Butyl benzylphthalate (BBP)	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Caprolactam	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Carbazole	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	530 J	230 U	230 U
Chrysene	-	-	-	µg/kg	110 J	230 U	220 U	640 J	1100 U	540 J	11000	520	550
Dibenz(a,h)anthracene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	1700 J	230 U	110 J
Dibenzofuran	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2800	91 J	120 J
Diethyl phthalate	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Dimethyl phthalate	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Di-n-butylphthalate (DBP)	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Di-n-octyl phthalate (DnOP)	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Fluoranthene	-	-	-	µg/kg	230 J	230 U	220 U	2400	370 J	1600	35000	1400	1300
Fluorene	-	-	-	µg/kg	230 U	230 U	220 U	180 J	1100 U	160 J	6400	220 J	180 J
Hexachlorobenzene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Hexachlorobutadiene	<1200	1200-12000	>12000	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Hexachlorocyclopentadiene	<810	810-8100	>8100	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Hexachloroethane	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Indeno(1,2,3-cd)pyrene	-	-	-	µg/kg	230 U	230 U	220 U	410 J	1100 U	290 J	5300	320	370
Isophorone	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Naphthalene	-	-	-	µg/kg	230 U	120 J	350	1100 U	1100 U	1100 U	2300 U	62 J	160 J
Nitrobenzene	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
N-Nitrosodi-n-propylamine	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
N-Nitrosodiphenylamine	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Pentachlorophenol	<14000	14000-19000	>19000	µg/kg	460 U	440 U	440 U	2200 U	2100 U	2200 U	4500 U	440 U	440 U
Phenanthrene	-	-	-	µg/kg	210 J	230 U	220 U	630 J	1100 U	1100	31000	1200	940
Phenol	-	-	-	µg/kg	230 U	230 U	220 U	1100 U	1100 U	1100 U	2300 U	230 U	230 U
Pyrene	-	-	-	µg/kg	240	230 U	220 U	1700	1100 U	1300	26000	1400	1300
Total PAHs	<4000	4000-35000	>35000	µg/kg	1335	120	350	**9410 [B]**	780	**7430 [B]**	**174000 [C]**	**7948 [B]**	**7899 [B]**
Total SVOCs	-	-	-	µg/kg	1335	120	350	9410	780	7340	177330	8039	8019
Pesticides/PCBs													
Aroclor-1016 (PCB-1016)	-	-	-	mg/kg	-	-	-	0.31 U	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	-	-	mg/kg	-	-	-	0.31 U	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	-	-	mg/kg	-	-	-	0.31 U	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	-	-	mg/kg	-	-	-	0.10 J	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	-	-	mg/kg	-	-	-	0.31 U	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	-	-	mg/kg	-	-	-	0.31 U	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	-	-	mg/kg	-	-	-	0.31 U	-	-	-	-	-
Total PCBs	<100	100-1000	>1000	mg/kg	-	-	-	0.1 J	-	-	-	-	-
4,4'-DDD	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID:	SR-1	SR-1	SR-1	SR-2	SR-2	SR-2	SR-3	SR-3	SR-3
					Sample Date:	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
					Depth:	0-0.5 ft bgs	1.5-2 ft bgs	2.5-3 ft bgs	0-0.5 ft bgs	1.5-2 ft bgs	2.5-3 ft bgs	0-0.5 ft bgs	1.5-2 ft bgs	2.5-3 ft bgs
4,4'-DDE	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
4,4'-DDT	<44	44-48000	>48000	µg/kg	-	-	-	16 J	-	-	-	-	-	
Aldrin	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
alpha-BHC	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
alpha-Chlordane	<68	68-38000	>38000	µg/kg	-	-	-	22 U	-	-	-	-	-	
beta-BHC	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
delta-BHC	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
Dieldrin	<180	180-720	>720	µg/kg	-	-	-	22 U	-	-	-	-	-	
Endosulfan I	<1	1-20	>20	µg/kg	-	-	-	22 U	-	-	-	-	-	
Endosulfan II	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
Endosulfan sulfate	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
Endrin	<90	90-220	>220	µg/kg	-	-	-	22 U	-	-	-	-	-	
Endrin aldehyde	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
Endrin ketone	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
gamma-BHC (lindane)	<47	47-78	>78	µg/kg	-	-	-	22 U	-	-	-	-	-	
gamma-Chlordane	-	-	-	µg/kg	-	-	-	22 U	-	-	-	-	-	
Heptachlor	<75	75-10000	>10000	µg/kg	-	-	-	22 U	-	-	-	-	-	
Heptachlor epoxide	<15	15-2100	>2100	µg/kg	-	-	-	22 U	-	-	-	-	-	
Methoxychlor	<59	>59	-	µg/kg	-	-	-	20 J	-	-	-	-	-	
Toxaphene	<6	6-250	>250	µg/kg	-	-	-	220 U	-	-	-	-	-	
Metals														
Aluminum	-	-	-	mg/kg	4860	4240	4630	4560	3040	3010	5520	3760 J	4690 J	
Antimony	-	-	-	mg/kg	19.6 U	21.9 U	20.8 U	20.9 U	18.4 U	21.3 U	21.5 U	19.8 UJ	22.3 UJ	
Arsenic	<10	10-33	>33	mg/kg	4.7	2.7 J	3.9	2.2 J	2.9	2.5 J	3.0	2.2 J	3.0 J	
Barium	-	-	-	mg/kg	15.4	13.6	16.2	17.2	8.4	8.6	24.9	11.7 J	19.6 J	
Beryllium	-	-	-	mg/kg	0.24 J	0.24 J	0.29	0.24 J	0.13 J	0.16 J	0.29	0.21 J	0.23 J	
Cadmium	<1	1-5	>5	mg/kg	0.093 J	0.29 U	0.053 J	0.11 J	0.24 U	0.060 J	0.16 J	0.048 J	0.061 J	
Calcium	-	-	-	mg/kg	3480	4150	3300	5080	6060	5400	5770	4610 J	6610 J	
Chromium	<43	43-110	>110	mg/kg	10.1	9.1	10.7	9.1	5.9	5.6	18.8	7.8 J	16.4 J	
Cobalt	-	-	-	mg/kg	8.1	4.7	4.6	3.5	3.4	3.2	4.2	3.5	3.7	
Copper	<32	32-150	>150	mg/kg	6.6	4.3	5.3	5.8	3.2	3.4	9.9	3.5 J	5.6 J	
Iron	-	-	-	mg/kg	8820	7660	18300	8520	7020	6960	13800	9200	11000	
Lead	<36	36-130	>130	mg/kg	5.9	4.6	5.1	14.2	3.8	3.7	6.6	3.6 J	4.5 J	
Magnesium	-	-	-	mg/kg	1450	2450	1780	2720	3710	3460	2380	2790 J	2750 J	
Manganese	-	-	-	mg/kg	64.7	66.4	71.8	69	93.2	86.7	111	95.2 J	100 J	
Mercury	<0.2	0.2-1	>1	mg/kg	0.050	0.028 U	0.026 U	0.021 J	0.025 U	0.011 J	0.016 J	0.019 J	0.026 U	
Nickel	<23	23-49	>49	mg/kg	14.0	10.3	10.3	8.2	7.8	7.7	10.6	8.0	8.8	
Potassium	-	-	-	mg/kg	773	640	596	611	542	548	660	530	642	
Selenium	-	-	-	mg/kg	5.2 U	5.8 U	5.5 U	5.6 U	4.9 U	5.7 U	5.7 U	5.3 U	6.0 U	
Silver	<1	1-2.2	>2.2	mg/kg	0.79 U	0.87 U	0.83 U	0.84 U	0.73 U	0.85 U	0.34 J	0.79 U	0.89 U	
Sodium	-	-	-	mg/kg	183 U	204 U	194 U	195 U	171 U	199 U	201 U	185 U	209 U	
Thallium	-	-	-	mg/kg	7.9 U	8.7 U	8.3 U	8.4 U	7.3 U	8.5 U	8.6 U	7.9 U	8.9 U	
Vanadium	-	-	-	mg/kg	13.7	10.4	11.7	8.1	8.1	7.3	14.2	11.6	11.1	
Zinc	<120	120-460	>460	mg/kg	42.3	27.0	28.0	36.2	27.0	28.8	40.7	23.8	29.3	
General Chemistry														
Cyanide (total)	-	-	-	mg/kg	-	-	-	1.2 U	-	-	-	-	-	
Total organic carbon (TOC)	-	-	-	mg/kg	5010	1330	1160	13800	2600	6520	9750	3030	3160	

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-4 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-4 9/21/2016 1.5-2 ft bgs	SR-4 9/21/2016 2.5-3 ft bgs	SR-5 9/21/2016 0-0.5 ft bgs	SR-5 9/21/2016 1.5-2 ft bgs	SR-5 9/21/2016 2.5-3 ft bgs	SR-6 9/21/2016 0-0.5 ft bgs	SR-6 9/21/2016 1.5-2 ft bgs	SR-6 9/21/2016 2.5-3 ft bgs
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	<1900	1900-3500	>3500	µg/kg	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	<2800	2800-5400	>5400	µg/kg	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	<520	520-4700	>4700	µg/kg	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	<35000	35000-55000	>55000	µg/kg	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	<280	280-2500	>2500	µg/kg	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	<1800	1800-7100	>7100	µg/kg	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	<720	720-3300	>3300	µg/kg	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
2-Hexanone	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Acetone	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Benzene	<530	530-1900	>1900	µg/kg	-	-	-	-	-	-	-	-	-
Bromodichloromethane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Bromoform	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	<1070	1070-9600	>9600	µg/kg	-	-	-	-	-	-	-	-	-
Chlorobenzene	<200	200-1700	>1700	µg/kg	-	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Ethylbenzene	<430	430-3700	>3700	µg/kg	-	-	-	-	-	-	-	-	-
Isopropyl benzene	<210	210-1800	>1800	µg/kg	-	-	-	-	-	-	-	-	-
Methyl acetate	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Methylene chloride	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Styrene	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Tetrachloroethene	<16000	16000-57000	>57000	µg/kg	-	-	-	-	-	-	-	-	-
Toluene	<930	930-4500	>4500	µg/kg	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	<1200	1200-11000	>11000	µg/kg	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Trichloroethene	<1800	1800-8600	>8600	µg/kg	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Vinyl chloride	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Xylenes (total)	<590	590-5200	>5200	µg/kg	-	-	-	-	-	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2,4,5-Trichlorophenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2,4,6-Trichlorophenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2,4-Dichlorophenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2,4-Dimethylphenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2,4-Dinitrophenol	-	-	-	µg/kg	46000 U	11000 U	22000 U	22000 U	11000 U	11000 U	41000 U	11000 U	2200 U
2,4-Dinitrotoluene	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2,6-Dinitrotoluene	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2-Chloronaphthalene	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2-Chlorophenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2-Methylnaphthalene	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	1900 J	1100 U	230 U
2-Methylphenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
2-Nitroaniline	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
2-Nitrophenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-4 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-4 9/21/2016 1.5-2 ft bgs	SR-4 9/21/2016 2.5-3 ft bgs	SR-5 9/21/2016 0-0.5 ft bgs	SR-5 9/21/2016 1.5-2 ft bgs	SR-5 9/21/2016 2.5-3 ft bgs	SR-6 9/21/2016 0-0.5 ft bgs	SR-6 9/21/2016 1.5-2 ft bgs	SR-6 9/21/2016 2.5-3 ft bgs
3,3'-Dichlorobenzidine	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
3-Nitroaniline	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
4,6-Dinitro-2-methylphenol	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
4-Bromophenyl phenyl ether	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
4-Chloro-3-methylphenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
4-Chloroaniline	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
4-Chlorophenyl phenyl ether	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
4-Methylphenol	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
4-Nitroaniline	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
4-Nitrophenol	-	-	-	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
Acenaphthene	-	-	-	µg/kg	4700	210 J	860 J	450 J	1100 U	1100 U	12000	420 J	40 J
Acenaphthylene	-	-	-	µg/kg	4500 J	450 J	980 J	470 J	170 J	270 J	9400	450 J	35 J
Acetophenone	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Anthracene	-	-	-	µg/kg	8700	740 J	1700 J	750 J	1100 U	370 J	21000	820 J	84 J
Atrazine	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Benzaldehyde	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Benzo(a)anthracene	-	-	-	µg/kg	17000	1800	4900	2000 J	750 J	1100	37000	1800	160 J
Benzo(a)pyrene	-	-	-	µg/kg	16000	1700	4500	1900 J	660 J	1000 J	34000	1600	150 J
Benzo(b)fluoranthene	-	-	-	µg/kg	18000	1900	5100	2200	770 J	1300	37000	1400	160 J
Benzo(g,h,i)perylene	-	-	-	µg/kg	12000	1300	3300	1500 J	500 J	870 J	25000	1200	89 J
Benzo(k)fluoranthene	-	-	-	µg/kg	7600	1000 J	2200	1200 J	390 J	520 J	17000	1100	230 U
Biphenyl (1,1-Biphenyl)	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	1800 J	1100 U	230 U
bis(2-Chloroethoxy)methane	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
bis(2-Chloroethyl)ether	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
bis(2-Ethylhexyl)phthalate (DEHP)	<360000	>360000	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Butyl benzylphthalate (BBP)	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Caprolactam	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Carbazole	-	-	-	µg/kg	1000 J	1100 U	2200 U	2200 U	1100 U	1100 U	2800 J	1100 U	230 U
Chrysene	-	-	-	µg/kg	16000	1700	4300	1800 J	620 J	910 J	33000	1600	160 J
Dibenz(a,h)anthracene	-	-	-	µg/kg	2500 J	280 J	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Dibenzofuran	-	-	-	µg/kg	3600 J	240 J	700 J	390 J	1100 U	180 J	11000	360 J	33 J
Diethyl phthalate	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Dimethyl phthalate	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Di-n-butylphthalate (DBP)	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Di-n-octyl phthalate (DnOP)	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Fluoranthene	-	-	-	µg/kg	49000	4700	11000	5500	2000	2700	120000	4700	400
Fluorene	-	-	-	µg/kg	7300	580 J	1500 J	670 J	220 J	310 J	21000	730 J	67 J
Hexachlorobenzene	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Hexachlorobutadiene	<1200	1200-12000	>12000	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Hexachlorocyclopentadiene	<810	810-8100	>8100	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Hexachloroethane	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Indeno(1,2,3-cd)pyrene	-	-	-	µg/kg	9900	990 J	2600	1300 J	420 J	660 J	21000	970 J	73 J
Isophorone	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Naphthalene	-	-	-	µg/kg	1500 J	1100 U	570 J	2200 U	180 J	220 J	5400	1100 U	36 J
Nitrobenzene	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
N-Nitrosodi-n-propylamine	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
N-Nitrosodiphenylamine	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Pentachlorophenol	<14000	14000-19000	>19000	µg/kg	9100 U	2200 U	4400 U	4300 U	2200 U	2200 U	8200 U	2200 U	440 U
Phenanthrene	-	-	-	µg/kg	37000	3600	7600	3300	1400	1700	97000	3400	250
Phenol	-	-	-	µg/kg	4700 U	1100 U	2200 U	2200 U	1100 U	1100 U	4200 U	1100 U	230 U
Pyrene	-	-	-	µg/kg	35000	3900	8700	3900	1500	2100	80000	3800	400
Total PAHs	<4000	4000-35000	>35000	µg/kg	**246700 C**	**24850 B**	**59810 C**	**26940 B**	**9580 B**	**14030 B**	**569800 C**	**23990 B**	2104
Total SVOCs	-	-	-	µg/kg	251300	25090	60510	27330	9580	14210	587300	24350	2137
Pesticides/PCBs													
Aroclor-1016 (PCB-1016)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Total PCBs	<100	100-1000	>1000	mg/kg	-	-	-	-	-	-	-	-	-
4,4'-DDD	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-4 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-4 9/21/2016 1.5-2 ft bgs	SR-4 9/21/2016 2.5-3 ft bgs	SR-5 9/21/2016 0-0.5 ft bgs	SR-5 9/21/2016 1.5-2 ft bgs	SR-5 9/21/2016 2.5-3 ft bgs	SR-6 9/21/2016 0-0.5 ft bgs	SR-6 9/21/2016 1.5-2 ft bgs	SR-6 9/21/2016 2.5-3 ft bgs
4,4'-DDE	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
4,4'-DDT	<44	44-48000	>48000	µg/kg	-	-	-	-	-	-	-	-	-
Aldrin	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
alpha-BHC	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
alpha-Chlordane	<68	68-38000	>38000	µg/kg	-	-	-	-	-	-	-	-	-
beta-BHC	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Dieldrin	<180	180-720	>720	µg/kg	-	-	-	-	-	-	-	-	-
Endosulfan I	<1	1-20	>20	µg/kg	-	-	-	-	-	-	-	-	-
Endosulfan II	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Endrin	<90	90-220	>220	µg/kg	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	<47	47-78	>78	µg/kg	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	µg/kg	-	-	-	-	-	-	-	-	-
Heptachlor	<75	75-10000	>10000	µg/kg	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	<15	15-2100	>2100	µg/kg	-	-	-	-	-	-	-	-	-
Methoxychlor	<59	>59	-	µg/kg	-	-	-	-	-	-	-	-	-
Toxaphene	<6	6-250	>250	µg/kg	-	-	-	-	-	-	-	-	-
Metals													
Aluminum	-	-	-	mg/kg	6150 J	10000 J	2860 J	6940 J	3530 J	2410 J	13500 J	10800 J	5730 J
Antimony	-	-	-	mg/kg	19.0 UJ	18.7 UJ	18.2 UJ	20.9 UJ	19.8 UJ	18.9 UJ	18.4 UJ	21.2 UJ	20.1 UJ
Arsenic	<10	10-33	>33	mg/kg	3.7 J	3.0 J	2.6 J	5.3 J	2.9 J	2.8 J	5.5 J	3.9 J	4.1 J
Barium	-	-	-	mg/kg	29.5 J	46.9 J	8.9 J	33.9 J	9.8 J	6.3 J	76.7 J	54.3 J	26.7 J
Beryllium	-	-	-	mg/kg	0.40	0.57	0.14 J	0.47	0.22 J	0.13 J	0.97	0.65	0.35
Cadmium	<1	1-5	>5	mg/kg	0.24 J	0.12 J	0.059 J	0.15 J	0.11 J	0.25 U	0.24	0.089 J	0.11 J
Calcium	-	-	-	mg/kg	5520 J	6260 J	4360 J	4430 J	1590 J	1450 J	6220 J	8010 J	2600 J
Chromium	<43	43-110	>110	mg/kg	12.4 J	35.5 J	4.5 J	21.5 J	6.9 J	3.7 J	**55.8 J [B]**	30.1 J	18.7 J
Cobalt	-	-	-	mg/kg	4.2	5.1	3.5	4.2	6.2	4.1	8.1	8.5	4.8
Copper	<32	32-150	>150	mg/kg	9.9 J	9.0 J	4.6 J	**43.5 J [B]**	6.2 J	3.1 J	22.3 J	8.9 J	8.1 J
Iron	-	-	-	mg/kg	14100	21200	6970	19000	6900	5410	26800	18900	11800
Lead	<36	36-130	>130	mg/kg	9.1 J	6.0 J	4.5 J	11.6 J	5.5 J	3.3 J	20.7 J	10.3 J	8.2 J
Magnesium	-	-	-	mg/kg	2290 J	2600 J	2880 J	1770 J	1240 J	1190 J	1670 J	1300 J	1140 J
Manganese	-	-	-	mg/kg	87.2 J	102 J	90.6 J	107 J	60.1 J	47.4 J	134 J	120 J	72.4 J
Mercury	<0.2	0.2-1	>1	mg/kg	0.027 J	0.023 J	0.015 J	0.047	0.015 J	0.027 U	0.060	0.027	0.032
Nickel	<23	23-49	>49	mg/kg	10.8	11.9	8.2	11.9	11.7	7.1	22.5	16.7	12.3
Potassium	-	-	-	mg/kg	725	1130	530	771	597	429	1440	1240	722
Selenium	-	-	-	mg/kg	5.1 U	5.0 U	4.8 U	5.6 U	5.3 U	5.0 U	0.56 J	5.6 U	5.3 U
Silver	<1	1-2.2	>2.2	mg/kg	0.76 U	0.75 U	0.73 U	**1.3 [B]**	0.79 U	0.76 U	**9.2 [C]**	0.36 J	**1.5 [B]**
Sodium	-	-	-	mg/kg	177 U	205 U	170 U	195 U	185 U	177 U	267 U	249 U	187 U
Thallium	-	-	-	mg/kg	7.6 U	7.5 U	7.3 U	8.4 U	7.9 U	7.6 U	7.3 U	8.5 U	8.0 U
Vanadium	-	-	-	mg/kg	13.3	17.1	7.4	16.6	12.8	6.6	26.1	17.7	12.8
Zinc	<120	120-460	>460	mg/kg	59.3	35.1	32.1	51.1	40.1	25.5	81.8	38.7	47.4
General Chemistry													
Cyanide (total)	-	-	-	mg/kg	-	-	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	mg/kg	7020	8480	6450	4110	2670	3100	11400	2960	9050

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-7 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-7 9/21/2016 1.5-2 ft bgs	SR-7 9/21/2016 2.5-3 ft bgs	SR-8 9/21/2016 0-0.5 ft bgs	SR-8 9/21/2016 0-0.5 ft bgs Duplicate	SR-8 9/21/2016 1.5-2 ft bgs	SR-8 9/21/2016 2.5-3 ft bgs
Volatile Organic Compounds (VOCs)											
1,1,1-Trichloroethane	<1900	1900-3500	>3500	µg/kg	84 U	-	-	-	-	73 U	-
1,1,2,2-Tetrachloroethane	<2800	2800-5400	>5400	µg/kg	84 U	-	-	-	-	73 U	-
1,1,2-Trichloroethane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
1,1-Dichloroethane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
1,1-Dichloroethene	<520	520-4700	>4700	µg/kg	84 U	-	-	-	-	73 U	-
1,2,4-Trichlorobenzene	<35000	35000-55000	>55000	µg/kg	84 U	-	-	-	-	73 U	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
1,2-Dichlorobenzene	<280	280-2500	>2500	µg/kg	84 U	-	-	-	-	73 U	-
1,2-Dichloroethane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
1,2-Dichloropropane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
1,3-Dichlorobenzene	<1800	1800-7100	>7100	µg/kg	84 U	-	-	-	-	73 U	-
1,4-Dichlorobenzene	<720	720-3300	>3300	µg/kg	84 U	-	-	-	-	73 U	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	-	µg/kg	420 U	-	-	-	-	360 U	-
2-Hexanone	-	-	-	µg/kg	420 U	-	-	-	-	360 U	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	µg/kg	420 U	-	-	-	-	360 U	-
Acetone	-	-	-	µg/kg	420 U	-	-	-	-	360 U	-
Benzene	<530	530-1900	>1900	µg/kg	170	-	-	-	-	180 J	-
Bromodichloromethane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Bromoform	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Bromomethane (Methyl bromide)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Carbon disulfide	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Carbon tetrachloride	<1070	1070-9600	>9600	µg/kg	84 U	-	-	-	-	73 U	-
Chlorobenzene	<200	200-1700	>1700	µg/kg	84 U	-	-	-	-	73 U	-
Chloroethane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Chloroform (Trichloromethane)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Chloromethane (Methyl chloride)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
cis-1,2-Dichloroethene	-	-	-	µg/kg	59 J	-	-	-	-	73 U	-
cis-1,3-Dichloropropene	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Cyclohexane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Dibromochloromethane	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Dichlorodifluoromethane (CFC-12)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Ethylbenzene	<430	430-3700	>3700	µg/kg	140	-	-	-	-	150 J	-
Isopropyl benzene	<210	210-1800	>1800	µg/kg	24 J	-	-	-	-	82 J	-
Methyl acetate	-	-	-	µg/kg	480	-	-	-	-	160	-
Methyl cyclohexane	-	-	-	µg/kg	58 J	-	-	-	-	48 J	-
Methyl tert butyl ether (MTBE)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Methylene chloride	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Styrene	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Tetrachloroethene	<16000	16000-57000	>57000	µg/kg	84 U	-	-	-	-	73 U	-
Toluene	<930	930-4500	>4500	µg/kg	**1200** [B]	-	-	-	-	160 J	-
trans-1,2-Dichloroethene	<1200	1200-11000	>11000	µg/kg	84 U	-	-	-	-	73 U	-
trans-1,3-Dichloropropene	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Trichloroethene	<1800	1800-8600	>8600	µg/kg	52 J	-	-	-	-	73 U	-
Trichlorofluoromethane (CFC-11)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Trifluorotrichloroethane (CFC-113)	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Vinyl chloride	-	-	-	µg/kg	84 U	-	-	-	-	73 U	-
Xylenes (total)	<590	590-5200	>5200	µg/kg	200	-	-	-	-	190	-
Semi-volatile Organic Compounds (SVOCs)											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2,4,5-Trichlorophenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2,4,6-Trichlorophenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2,4-Dichlorophenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2,4-Dimethylphenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2,4-Dinitrophenol	-	-	-	µg/kg	46000 U	41000 U	11000 U	46000 U	46000 U	110000 U	24000 U
2,4-Dinitrotoluene	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2,6-Dinitrotoluene	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2-Chloronaphthalene	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2-Chlorophenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2-Methylnaphthalene	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2-Methylphenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
2-Nitroaniline	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
2-Nitrophenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-7 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-7 9/21/2016 1.5-2 ft bgs	SR-7 9/21/2016 2.5-3 ft bgs	SR-8 9/21/2016 0-0.5 ft bgs	SR-8 9/21/2016 0-0.5 ft bgs Duplicate	SR-8 9/21/2016 1.5-2 ft bgs	SR-8 9/21/2016 2.5-3 ft bgs
3,3'-Dichlorobenzidine	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
3-Nitroaniline	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
4,6-Dinitro-2-methylphenol	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
4-Bromophenyl phenyl ether	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
4-Chloro-3-methylphenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
4-Chloroaniline	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
4-Chlorophenyl phenyl ether	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
4-Methylphenol	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
4-Nitroaniline	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
4-Nitrophenol	-	-	-	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
Acenaphthene	-	-	-	µg/kg	2900 J	2000 J	1100 U	1300 J	1700 J	11000 U	2400 U
Acenaphthylene	-	-	-	µg/kg	2900 J	2100 J	1100 U	1400 J	2400 J	11000 U	2400 U
Acetophenone	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Anthracene	-	-	-	µg/kg	4800	4000 J	290 J	3000 J	4600 J	11000 U	2400 U
Atrazine	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Benzaldehyde	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Benzo(a)anthracene	-	-	-	µg/kg	11000	8300	430 J	7400	9500	11000 U	820 J
Benzo(a)pyrene	-	-	-	µg/kg	12000	8000	430 J	7000	9200	11000 U	640 J
Benzo(b)fluoranthene	-	-	-	µg/kg	15000	9500	530 J	8400	12000	11000 U	1000 J
Benzo(g,h,i)perylene	-	-	-	µg/kg	8800	6000	260 J	4600 J	6300	11000 U	450 J
Benzo(k)fluoranthene	-	-	-	µg/kg	5700	3800 J	190 J	3800 J	4200 J	11000 U	360 J
Biphenyl (1,1-Biphenyl)	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
bis(2-Chloroethoxy)methane	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
bis(2-Chloroethyl)ether	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
bis(2-Ethylhexyl)phthalate (DEHP)	<360000	>360000	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2300 J
Butyl benzylphthalate (BBP)	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Caprolactam	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Carbazole	-	-	-	µg/kg	890 J	530 J	1100 U	4700 U	4700 U	11000 U	2400 U
Chrysene	-	-	-	µg/kg	11000	7700	430 J	7200	9300	11000 U	1200 J
Dibenz(a,h)anthracene	-	-	-	µg/kg	2000 J	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Dibenzofuran	-	-	-	µg/kg	2300 J	1900 J	130 J	1200 J	2100 J	11000 U	2400 U
Diethyl phthalate	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Dimethyl phthalate	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Di-n-butylphthalate (DBP)	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Di-n-octyl phthalate (DnOP)	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Fluoranthene	-	-	-	µg/kg	31000	22000	1200	18000	23000	1800 J	2100 J
Fluorene	-	-	-	µg/kg	4100 J	3700 J	260 J	2500 J	4300 J	11000 U	510 J
Hexachlorobenzene	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Hexachlorobutadiene	<1200	1200-12000	>12000	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Hexachlorocyclopentadiene	<810	810-8100	>8100	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Hexachloroethane	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Indeno(1,2,3-cd)pyrene	-	-	-	µg/kg	7100	4600	230 J	3600 J	5400	11000 U	370 J
Isophorone	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Naphthalene	-	-	-	µg/kg	3100 J	1500 J	1100 U	1400 J	3100 J	11000 U	320 J
Nitrobenzene	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
N-Nitrosodi-n-propylamine	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
N-Nitrosodiphenylamine	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Pentachlorophenol	<14000	14000-19000	>19000	µg/kg	9100 U	8100 U	2200 U	9100 U	9200 U	22000 U	4700 U
Phenanthrene	-	-	-	µg/kg	19000	14000	960 J	14000	21000	3500 J	2200 J
Phenol	-	-	-	µg/kg	4700 U	4200 U	1100 U	4700 U	4700 U	11000 U	2400 U
Pyrene	-	-	-	µg/kg	23000	18000	1100	16000	21000	1800 J	1800 J
Total PAHs	<4000	4000-35000	>35000	µg/kg	**163400 C**	**115200 C**	**6310 B**	**99600 C**	**137000 C**	**7100 B**	**11770 B**
Total SVOCs	-	-	-	µg/kg	166590	117630	6440	100800	139100	7100	14070
Pesticides/PCBs											
Aroclor-1016 (PCB-1016)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.30 U	-
Aroclor-1221 (PCB-1221)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.30 U	-
Aroclor-1232 (PCB-1232)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.30 U	-
Aroclor-1242 (PCB-1242)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.30 U	-
Aroclor-1248 (PCB-1248)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.29 J	-
Aroclor-1254 (PCB-1254)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.30 U	-
Aroclor-1260 (PCB-1260)	-	-	-	mg/kg	0.27 U	-	-	-	-	0.30 U	-
Total PCBs	<100	100-1000	>1000	mg/kg	0.27 U	-	-	-	-	0.29 J	-
4,4'-DDD	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-

Table 2.9

2016 Embayment Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Unit	Location ID: SR-7 Sample Date: 9/21/2016 Depth: 0-0.5 ft bgs	SR-7 9/21/2016 1.5-2 ft bgs	SR-7 9/21/2016 2.5-3 ft bgs	SR-8 9/21/2016 0-0.5 ft bgs	SR-8 9/21/2016 0-0.5 ft bgs Duplicate	SR-8 9/21/2016 1.5-2 ft bgs	SR-8 9/21/2016 2.5-3 ft bgs
4,4'-DDE	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
4,4'-DDT	<44	44-48000	>48000	µg/kg	23 U	-	-	-	-	22 U	-
Aldrin	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
alpha-BHC	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
alpha-Chlordane	<68	68-38000	>38000	µg/kg	23 U	-	-	-	-	22 U	-
beta-BHC	-	-	-	µg/kg	4.7 J	-	-	-	-	22 U	-
delta-BHC	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
Dieldrin	<180	180-720	>720	µg/kg	23 U	-	-	-	-	22 U	-
Endosulfan I	<1	1-20	>20	µg/kg	23 U	-	-	-	-	22 U	-
Endosulfan II	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
Endosulfan sulfate	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
Endrin	<90	90-220	>220	µg/kg	23 U	-	-	-	-	22 U	-
Endrin aldehyde	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
Endrin ketone	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
gamma-BHC (lindane)	<47	47-78	>78	µg/kg	23 U	-	-	-	-	22 U	-
gamma-Chlordane	-	-	-	µg/kg	23 U	-	-	-	-	22 U	-
Heptachlor	<75	75-10000	>10000	µg/kg	23 U	-	-	-	-	22 U	-
Heptachlor epoxide	<15	15-2100	>2100	µg/kg	23 U	-	-	-	-	22 U	-
Methoxychlor	<59	>59	-	µg/kg	23 U	-	-	-	-	5.3 J	-
Toxaphene	<6	6-250	>250	µg/kg	230 U	-	-	-	-	220 U	-
Metals											
Aluminum	-	-	-	mg/kg	7360 J	5990 J	3690 J	4100 J	5080 J	6940 J	7690 J
Antimony	-	-	-	mg/kg	20.8 UJ	19.0 UJ	19.4 UJ	19.3 UJ	20.4 UJ	20.7 UJ	20.3 UJ
Arsenic	<10	10-33	>33	mg/kg	7.9 J	5.9 J	3.3 J	6.3 J	6.9 J	**13.8 J [B]**	9.9 J
Barium	-	-	-	mg/kg	45.0 J	32.9 J	13.3 J	24.8 J	33.1 J	53.7 J	54.1 J
Beryllium	-	-	-	mg/kg	0.58	0.42	0.20 J	0.29	0.41	0.65	0.64
Cadmium	<1	1-5	>5	mg/kg	0.33	0.15 J	0.080 J	0.16 J	0.29	**3.5 [B]**	**2.1 [B]**
Calcium	-	-	-	mg/kg	7430 J	5720 J	4360 J	5090 J	10200 J	8790 J	9910 J
Chromium	<43	43-110	>110	mg/kg	27.2 J	28.1 J	11.9 J	12.1 J	18.6 J	29.9 J	30.7 J
Cobalt	-	-	-	mg/kg	5.4	4.6	3.8	3.9	4.9	6.5	7.1
Copper	<32	32-150	>150	mg/kg	24.9 J	**110 J [B]**	10.2 J	13.6 J	24.3 J	**47.2 J [B]**	**52.0 J [B]**
Iron	-	-	-	mg/kg	21200	16600	10700	12900	17000	16900	17300
Lead	<36	36-130	>130	mg/kg	25.8 J	17.3 J	8.3 J	13.1 J	26.8 J	**176 J [C]**	**106 J [B]**
Magnesium	-	-	-	mg/kg	2470 J	2010 J	2540 J	1820 J	2930 J	3420 J	3860 J
Manganese	-	-	-	mg/kg	176 J	145 J	94.5 J	218 J	323 J	166 J	202 J
Mercury	<0.2	0.2-1	>1	mg/kg	0.23	0.065	0.028	0.057	0.074	**0.30 [B]**	**0.41 [B]**
Nickel	<23	23-49	>49	mg/kg	16.7	**26.2 [B]**	12.9	11.1	18.0	**24.0 [B]**	**24.8 [B]**
Potassium	-	-	-	mg/kg	865	759	601	537	663	884	1050
Selenium	-	-	-	mg/kg	5.6 U	5.1 U	5.2 U	5.1 U	0.72 J	5.5 U	5.4 U
Silver	<1	1-2.2	>2.2	mg/kg	**9.1 [C]**	**2.4 [C]**	0.42 J	**10.1 J [C]**	**1.5 J [B]**	0.69 J	0.52 J
Sodium	-	-	-	mg/kg	194 U	177 U	181 U	180 U	191 U	193 U	189 U
Thallium	-	-	-	mg/kg	8.3 U	7.6 U	7.8 U	7.7 U	8.2 U	8.3 U	8.1 U
Vanadium	-	-	-	mg/kg	20.0	13.7	8.5	12.7	17.5	25.7	18.2
Zinc	<120	120-460	>460	mg/kg	**127 [B]**	74.2	38.1	81.6	120	**810 [C]**	**474 [C]**
General Chemistry											
Cyanide (total)	-	-	-	mg/kg	1.1 J	-	-	-	-	1.3 U	-
Total organic carbon (TOC)	-	-	-	mg/kg	14300	21100	2780	22300	30500	16000	3030

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.10

1989 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

	Source:	SW-5	SW-6
	Date:	12/20/1989	12/20/1989
VOCs (µg/kg)			
1,1,1-Trichloroethane		ND (20)	ND (20)
Methylene Chloride		2,500	2,090
1,2-Dichloroethene (total)		2,690	90
Benzene		40	190
Toluene		200	420
Total Xylenes		ND (20)	280
Ethylbenzene		ND (20)	110
BNAs (µg/kg)			
Acenaphthylene		ND (7,500)*	ND (6,000)*
Phenanthrene		8,350	125,000
Pyrene		9,620	ND (6,000)*
Anthracene		ND (7,500)*	36,600
Benzo(a) Anthracene		ND (7,500)*	20,800
Benzo (a) Pyrene			
Benzo(b) Fluoranthene (1)		ND (7,500)*	39,900
Benzo(k) Fluoranthene (1)		ND (7,500)*	39,900
Chrysene		ND (7,500)*	32,000
DiBenz (a,h) Anthracene			
Fluoranthene		ND (7,500)*	106,000
Fluorene		ND (7,500)*	194,000
Indeno (1,2,3-od) Pyrene			
Naphthalene			
Other Compounds (mg/kg)			
Oil and Grease		4,060	31.7

Notes:

All other SSI parameters, cyanide and Cr+6 were not detected.
* - High quantifiable limits due to dilution.
** - Value listed is that for total polycyclic aromatic hydrocarbons (PAHs).
(1) - Indistinguishable isomers, reported value is total concentration.
ND - Not detected above quantifiable limits stated in parentheses.
(2) - USEPA Ecotox Thresholds (Sediment Quality Benchmark, Effects Range Low).
(3) - Draft Minnesota Sediment Ecological Screening Criteria.
(4) - New York Benthic Aquatic Life Chronic Toxicity.

Table 2.11

2016 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Units	Location ID: SD-1 Sample Date: 9/13/2016 Depth: 0-0.5 ft bgs	SD-1 9/13/2016 1-1.5 ft bgs	SD-2 9/13/2016 0-0.5 ft bgs	SD-2 9/13/2016 1-1.5 ft bgs	SD-3 9/13/2016 0-0.5 ft bgs	SD-3 9/13/2016 1-1.5 ft bgs	SD-4 9/13/2016 0-0.5 ft bgs	SD-4 9/13/2016 1-1.5 ft bgs	SD-5 9/13/2016 0-0.5 ft bgs
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	<1900	1900-3500	>3500	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,1,2,2-Tetrachloroethane	<2800	2800-5400	>5400	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,1,2-Trichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,1-Dichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,1-Dichloroethene	<520	520-4700	>4700	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,2,4-Trichlorobenzene	<35000	35000-55000	>55000	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,2-Dichlorobenzene	<280	280-2500	>2500	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,2-Dichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,2-Dichloropropane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,3-Dichlorobenzene	<1800	1800-7100	>7100	µg/kg	-	-	-	-	-	-	6.0 U	-	-
1,4-Dichlorobenzene	<720	720-3300	>3300	µg/kg	-	-	-	-	-	-	6.0 U	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	-	µg/kg	-	-	-	-	-	-	12 J	-	-
2-Hexanone	-	-	-	µg/kg	-	-	-	-	-	-	30 U	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	µg/kg	-	-	-	-	-	-	30 U	-	-
Acetone	-	-	-	µg/kg	-	-	-	-	-	-	62	-	-
Benzene	<530	530-1900	>1900	µg/kg	-	-	-	-	-	-	0.83 J	-	-
Bromodichloromethane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Bromoform	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Bromomethane (Methyl bromide)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Carbon disulfide	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Carbon tetrachloride	<1070	1070-9600	>9600	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Chlorobenzene	<200	200-1700	>1700	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Chloroethane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Chloroform (Trichloromethane)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Chloromethane (Methyl chloride)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
cis-1,2-Dichloroethene	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
cis-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Cyclohexane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Dibromochloromethane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Ethylbenzene	<430	430-3700	>3700	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Isopropyl benzene	<210	210-1800	>1800	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Methyl acetate	-	-	-	µg/kg	-	-	-	-	-	-	30 U	-	-
Methyl cyclohexane	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Methyl tert butyl ether (MTBE)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Methylene chloride	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Styrene	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Tetrachloroethene	<16000	16000-57000	>57000	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Toluene	<930	930-4500	>4500	µg/kg	-	-	-	-	-	-	6.0 U	-	-
trans-1,2-Dichloroethene	<1200	1200-11000	>11000	µg/kg	-	-	-	-	-	-	6.0 U	-	-
trans-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Trichloroethene	<1800	1800-8600	>8600	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Trichlorofluoromethane (CFC-11)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Trifluorotrichloroethane (CFC-113)	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Vinyl chloride	-	-	-	µg/kg	-	-	-	-	-	-	6.0 U	-	-
Xylenes (total)	<590	590-5200	>5200	µg/kg	-	-	-	-	-	-	12 U	-	-
Semi-volatile Organic Compounds (SVOCs)													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2,4,5-Trichlorophenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2,4,6-Trichlorophenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2,4-Dichlorophenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2,4-Dimethylphenol	-	-	-	µg/kg	6200 U	17000 U	52000 J	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2,4-Dinitrophenol	-	-	-	µg/kg	60000 U	170000 U	1900000 U	340000 U	74000 U	140000 U	50000 U	210000 U	540000 U
2,4-Dinitrotoluene	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2,6-Dinitrotoluene	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2-Chloronaphthalene	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2-Chlorophenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2-Methylnaphthalene	-	-	-	µg/kg	6200 U	17000 U	2500000	170000	3600 J	3300 J	5100 U	4300 J	55000 U
2-Methylphenol	-	-	-	µg/kg	6200 U	17000 U	33000 J	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U
2-Nitroaniline	-	-	-	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U
2-Nitrophenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U

Table 2.11

2016 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Units	Location ID:	SD-1	SD-1	SD-2	SD-2	SD-3	SD-3	SD-4	SD-4	SD-5
					Sample Date:	9/13/2016	9/13/2016	9/13/2016	9/13/2016	9/13/2016	9/13/2016	9/13/2016	9/13/2016	9/13/2016
					Depth:	0-0.5 ft bgs	1-1.5 ft bgs	0-0.5 ft bgs	1-1.5 ft bgs	0-0.5 ft bgs	1-1.5 ft bgs	0-0.5 ft bgs	1-1.5 ft bgs	0-0.5 ft bgs
3,3'-Dichlorobenzidine	-	-	-	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
3-Nitroaniline	-	-	-	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
4,6-Dinitro-2-methylphenol	-	-	-	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
4-Bromophenyl phenyl ether	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
4-Chloro-3-methylphenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
4-Chloroaniline	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
4-Chlorophenyl phenyl ether	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
4-Methylphenol	-	-	-	µg/kg	12000 U	34000 U	54000 J	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
4-Nitroaniline	-	-	-	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
4-Nitrophenol	-	-	-	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
Acenaphthene	-	-	-	µg/kg	4900 J	18000	990000	74000	2400 J	4800 J	5500	8800 J	18000 J	
Acenaphthylene	-	-	-	µg/kg	4000 J	3000 J	1700000	100000	2300 J	1800 J	12000	8800 J	42000 J	
Acetophenone	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Anthracene	-	-	-	µg/kg	6200	4800 J	2200000	160000	3400 J	6900 J	24000	12000 J	61000	
Atrazine	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Benzaldehyde	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Benzo(a)anthracene	-	-	-	µg/kg	24000	24000	2400000	180000	12000	14000	51000	35000	130000	
Benzo(a)pyrene	-	-	-	µg/kg	28000	34000	2100000	160000	17000	19000	45000	39000	120000	
Benzo(b)fluoranthene	-	-	-	µg/kg	31000	36000	2600000	190000	20000	21000	55000	45000	150000	
Benzo(g,h,i)perylene	-	-	-	µg/kg	21000	28000	1500000	93000	15000	18000	30000	31000	86000	
Benzo(k)fluoranthene	-	-	-	µg/kg	16000	17000	1000000	71000	9500	11000 J	27000	23000	56000	
Biphenyl (1,1-Biphenyl)	-	-	-	µg/kg	6200 U	17000 U	640000	45000	7600 U	14000 U	800 J	22000 U	55000 U	
bis(2-Chloroethoxy)methane	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
bis(2-Chloroethyl)ether	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
bis(2-Ethylhexyl)phthalate (DEHP)	<360000	>360000	-	µg/kg	6200 U	17000 U	190000 U	34000 U	2600 J	7100 J	5100 U	22000 U	55000 U	
Butyl benzylphthalate (BBP)	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Caprolactam	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Carbazole	-	-	-	µg/kg	2300 J	3000 J	1300000	94000	2000 J	14000 U	1800 J	22000 U	55000 U	
Chrysene	-	-	-	µg/kg	25000	28000	2400000	170000	14000	15000	50000	37000	130000	
Dibenz(a,h)anthracene	-	-	-	µg/kg	1900 J	17000 U	120000 J	9500 J	7600 U	14000 U	2700 J	22000 U	55000 U	
Dibenzofuran	-	-	-	µg/kg	2500 J	2500 J	2100000	150000	3000 J	2300 J	6300	5800 J	15000 J	
Diethyl phthalate	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Dimethyl phthalate	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Di-n-butylphthalate (DBP)	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Di-n-octyl phthalate (DnOP)	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Fluoranthene	-	-	-	µg/kg	49000	55000	9100000	560000	19000	24000	140000	82000	340000	
Fluorene	-	-	-	µg/kg	3700 J	3300 J	3000000	220000	2300 J	3600 J	13000	7300 J	33000 J	
Hexachlorobenzene	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Hexachlorobutadiene	<1200	1200-12000	>12000	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Hexachlorocyclopentadiene	<810	810-8100	>8100	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Hexachloroethane	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Indeno(1,2,3-cd)pyrene	-	-	-	µg/kg	18000	21000	1200000	84000	12000	14000	27000	25000	71000	
Isophorone	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Naphthalene	-	-	-	µg/kg	5800 J	8600 J	21000000	1400000	16000	17000	5000 J	2000000	11000 J	
Nitrobenzene	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
N-Nitrosodi-n-propylamine	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
N-Nitrosodiphenylamine	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Pentachlorophenol	<14000	14000-19000	>19000	µg/kg	12000 U	34000 U	370000 U	67000 U	15000 U	28000 U	9800 U	42000 U	110000 U	
Phenanthrene	-	-	-	µg/kg	22000	15000 J	13000000	800000	12000	8100 J	90000	37000	210000	
Phenol	-	-	-	µg/kg	6200 U	17000 U	190000 U	34000 U	7600 U	14000 U	5100 U	22000 U	55000 U	
Pyrene	-	-	-	µg/kg	43000	50000	7200000	440000	18000	21000	110000	67000	270000	
Total PAHs	<4000	4000-35000	>35000	µg/kg	**303500 C**	**345700 C**	**71510000 C**	**4711500 C**	**174900 C**	**199200 C**	**687200 C**	**2457900 C**	**1728000 C**	
Total SVOCs	-	-	-	µg/kg	308300	351200	78189000	5170500	186100	211900	696100	2468000	1743000	
Pesticides/PCBs														
Aroclor-1016 (PCB-1016)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Aroclor-1221 (PCB-1221)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Aroclor-1232 (PCB-1232)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Aroclor-1242 (PCB-1242)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Aroclor-1248 (PCB-1248)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Aroclor-1254 (PCB-1254)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Aroclor-1260 (PCB-1260)	-	-	-	mg/kg	-	-	-	-	-	-	0.32 U	-	-	
Total PCBs	<100	100-1000	>1000								0.32 U			
4,4'-DDD	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-	

Table 2.11

2016 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Units	Location ID: SD-1 Sample Date: 9/13/2016 Depth: 0-0.5 ft bgs	SD-1 9/13/2016 1-1.5 ft bgs	SD-2 9/13/2016 0-0.5 ft bgs	SD-2 9/13/2016 1-1.5 ft bgs	SD-3 9/13/2016 0-0.5 ft bgs	SD-3 9/13/2016 1-1.5 ft bgs	SD-4 9/13/2016 0-0.5 ft bgs	SD-4 9/13/2016 1-1.5 ft bgs	SD-5 9/13/2016 0-0.5 ft bgs
4,4'-DDE	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
4,4'-DDT	<44	44-48000	>48000	µg/kg	-	-	-	-	-	-	50 U	-	-
Aldrin	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
alpha-BHC	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
alpha-Chlordane	<68	68-38000	>38000	µg/kg	-	-	-	-	-	-	50 U	-	-
beta-BHC	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
delta-BHC	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
Dieldrin	<180	180-720	>720	µg/kg	-	-	-	-	-	-	50 U	-	-
Endosulfan I	<1	1-20	>20	µg/kg	-	-	-	-	-	-	50 U	-	-
Endosulfan II	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
Endosulfan sulfate	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
Endrin	<90	90-220	>220	µg/kg	-	-	-	-	-	-	50 U	-	-
Endrin aldehyde	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
Endrin ketone	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
gamma-BHC (lindane)	<47	47-78	>78	µg/kg	-	-	-	-	-	-	16 J	-	-
gamma-Chlordane	-	-	-	µg/kg	-	-	-	-	-	-	50 U	-	-
Heptachlor	<75	75-10000	>10000	µg/kg	-	-	-	-	-	-	50 U	-	-
Heptachlor epoxide	<15	15-2100	>2100	µg/kg	-	-	-	-	-	-	50 U	-	-
Methoxychlor	<59	>59	-	µg/kg	-	-	-	-	-	-	28 J	-	-
Toxaphene	<6	6-250	>250	µg/kg	-	-	-	-	-	-	500 U	-	-
Metals													
Aluminum	-	-	-	mg/kg	10600 J	12800 J	5780 J	10800 J	22800 J	15900 J	5120 J	13000 J	5960 J
Antimony	-	-	-	mg/kg	2.4 J	5.9 J	1.3 J	1.3 J	3.5 J	26.5 UJ	21.3 UJ	36.3 UJ	27.2 UJ
Arsenic	<10	10-33	>33	mg/kg	**13.9 B**	**19.9 B**	8.3	**16.7 B**	**23.0 B**	**19.1 B**	8.5	**19.1 B**	9.1
Barium	-	-	-	mg/kg	57.0 J	78.9 J	44.7 J	46.8 J	130 J	110 J	46.4 J	66.0 J	54.5 J
Beryllium	-	-	-	mg/kg	1.6	1.7	0.57	1.6	2.6	2.1	0.60	1.6	0.96
Cadmium	<1	1-5	>5	mg/kg	**1.2 B**	**2.7 B**	**1.1 B**	**4.7 B**	**1.5 B**	**1.6 B**	0.44	**1.9 B**	1.0
Calcium	-	-	-	mg/kg	7390	33600	7980	4270	5710	22200	22200	19900	12100
Chromium	<43	43-110	>110	mg/kg	**104 B**	**248 C**	23.4	19.8	**138 C**	**50.0 J B**	31.0 J	**100 J B**	28.0 J
Cobalt	-	-	-	mg/kg	10.1	15.9	6.5	38.1	21.0	17.1	7.1	8.1	8.8
Copper	<32	32-150	>150	mg/kg	**113 B**	**248 C**	**68.9 B**	**65.4 B**	**160 C**	**96.4 B**	**49.4 B**	**208 C**	**74.6 B**
Iron	-	-	-	mg/kg	37200	72500	16700	26500	52900	32700	24500	56300	21600
Lead	<36	36-130	>130	mg/kg	**190 J C**	**662 J C**	**88.2 J B**	**88.1 J B**	**294 J C**	**184 J C**	**77.9 J B**	**279 J C**	**92.0 J B**
Magnesium	-	-	-	mg/kg	3910	4320	3370	2390	6100	6560 J	5090 J	3250 J	4210 J
Manganese	-	-	-	mg/kg	356	735	221	202	343	392	397	815	304
Mercury	<0.2	0.2-1	>1	mg/kg	**1.3 C**	**2.3 C**	**0.37 B**	0.16	**0.99 B**	**0.45 B**	**0.43 B**	**3.4 C**	**0.22 B**
Nickel	<23	23-49	>49	mg/kg	**35.1 B**	**48.6 B**	21.9	**116 C**	**67.4 C**	**43.3 J B**	**24.3 J B**	**33.9 J B**	21.2 J
Potassium	-	-	-	mg/kg	1320 J	1790 J	1090 J	1220 J	3000 J	2430 J	827 J	1210 J	968 J
Selenium	-	-	-	mg/kg	1.4 J	8.3 U	1.6 J	1.3 J	3.1 J	2.3 J	5.7 U	3.2 J	1.7 J
Silver	<1	1-2.2	>2.2	mg/kg	**1.1 B**	**2.3 C**	1.2 U	1.3 U	0.98 J	1.1 U	**2.1 B**	**1.4 J B**	1.1 U
Sodium	-	-	-	mg/kg	263 U	291 U	287 U	293 U	286 U	248 U	199 U	339 U	254 U
Thallium	-	-	-	mg/kg	11.3 U	12.5 U	12.3 U	12.6 U	12.3 U	10.6 U	8.5 U	14.5 U	10.9 U
Vanadium	-	-	-	mg/kg	27.8	37.3	21.2	19.2	48.0	33.1	18.8	49.2	16.9
Zinc	<120	120-460	>460	mg/kg	**548 J C**	**469 J C**	**328 J B**	**1730 J C**	**761 J C**	**345 B**	**251 B**	**617 C**	**267 B**
General Chemistry													
Cyanide (total)	-	-	-	mg/kg	-	-	-	-	-	-	1.5 U	-	-
Total organic carbon (TOC)	-	-	-	mg/kg	269000 J	275000 J	471000 J	134000	277000 J	295000 J	250000 J	190000 J	236000 J

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.11

2016 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Units	Location ID: SD-5 Sample Date: 9/13/2016 Depth: 1-1.5 ft bgs	SD-6 9/13/2016 0-0.5 ft bgs	SD-6 9/13/2016 1-1.5 ft bgs	SD-7 9/13/2016 0-0.5 ft bgs	SD-7 9/13/2016 1-1.5 ft bgs	SD-7 9/13/2016 1-1.5 ft bgs Duplicate	SD-8 9/13/2016 0-0.5 ft bgs	SD-8 9/13/2016 1-1.5 ft bgs
Volatile Organic Compounds (VOCs)												
1,1,1-Trichloroethane	<1900	1900-3500	>3500	µg/kg	-	-	-	-	-	-	-	25 U
1,1,2,2-Tetrachloroethane	<2800	2800-5400	>5400	µg/kg	-	-	-	-	-	-	-	25 U
1,1,2-Trichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
1,1-Dichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
1,1-Dichloroethene	<520	520-4700	>4700	µg/kg	-	-	-	-	-	-	-	25 U
1,2,4-Trichlorobenzene	<35000	35000-55000	>55000	µg/kg	-	-	-	-	-	-	-	25 U
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
1,2-Dibromoethane (Ethylene dibromide)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
1,2-Dichlorobenzene	<280	280-2500	>2500	µg/kg	-	-	-	-	-	-	-	25 U
1,2-Dichloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
1,2-Dichloropropane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
1,3-Dichlorobenzene	<1800	1800-7100	>7100	µg/kg	-	-	-	-	-	-	-	25 U
1,4-Dichlorobenzene	<720	720-3300	>3300	µg/kg	-	-	-	-	-	-	-	25 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	-	µg/kg	-	-	-	-	-	-	-	130 U
2-Hexanone	-	-	-	µg/kg	-	-	-	-	-	-	-	130 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	-	-	µg/kg	-	-	-	-	-	-	-	130 U
Acetone	-	-	-	µg/kg	-	-	-	-	-	-	-	130 U
Benzene	<530	530-1900	>1900	µg/kg	-	-	-	-	-	-	-	25 U
Bromodichloromethane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Bromoform	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Bromomethane (Methyl bromide)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Carbon disulfide	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Carbon tetrachloride	<1070	1070-9600	>9600	µg/kg	-	-	-	-	-	-	-	25 U
Chlorobenzene	<200	200-1700	>1700	µg/kg	-	-	-	-	-	-	-	25 U
Chloroethane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Chloroform (Trichloromethane)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Chloromethane (Methyl chloride)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
cis-1,2-Dichloroethene	-	-	-	µg/kg	-	-	-	-	-	-	-	4.5 J
cis-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Cyclohexane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Dibromochloromethane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Dichlorodifluoromethane (CFC-12)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Ethylbenzene	<430	430-3700	>3700	µg/kg	-	-	-	-	-	-	-	25 U
Isopropyl benzene	<210	210-1800	>1800	µg/kg	-	-	-	-	-	-	-	25 U
Methyl acetate	-	-	-	µg/kg	-	-	-	-	-	-	-	130 U
Methyl cyclohexane	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Methyl tert butyl ether (MTBE)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Methylene chloride	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Styrene	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Tetrachloroethene	<16000	16000-57000	>57000	µg/kg	-	-	-	-	-	-	-	25 U
Toluene	<930	930-4500	>4500	µg/kg	-	-	-	-	-	-	-	25 U
trans-1,2-Dichloroethene	<1200	1200-11000	>11000	µg/kg	-	-	-	-	-	-	-	25 U
trans-1,3-Dichloropropene	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Trichloroethene	<1800	1800-8600	>8600	µg/kg	-	-	-	-	-	-	-	25 U
Trichlorofluoromethane (CFC-11)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Trifluorotrichloroethane (CFC-113)	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Vinyl chloride	-	-	-	µg/kg	-	-	-	-	-	-	-	25 U
Xylenes (total)	<590	590-5200	>5200	µg/kg	-	-	-	-	-	-	-	51 U
Semi-volatile Organic Compounds (SVOCs)												
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2,4,5-Trichlorophenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2,4,6-Trichlorophenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2,4-Dichlorophenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2,4-Dimethylphenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2,4-Dinitrophenol	-	-	-	µg/kg	600000 U	720000 U	790000 U	110000 U	110000 U	100000 U	150000 U	36000 U
2,4-Dinitrotoluene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2,6-Dinitrotoluene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2-Chloronaphthalene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2-Chlorophenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2-Methylnaphthalene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	3900 J	3700 U
2-Methylphenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
2-Nitroaniline	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
2-Nitrophenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U

Table 2.11

2016 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Units	Location ID: / Sample Date: / Depth: SD-5 9/13/2016 1-1.5 ft bgs	SD-6 9/13/2016 0-0.5 ft bgs	SD-6 9/13/2016 1-1.5 ft bgs	SD-7 9/13/2016 0-0.5 ft bgs	SD-7 9/13/2016 1-1.5 ft bgs	SD-7 9/13/2016 1-1.5 ft bgs Duplicate	SD-8 9/13/2016 0-0.5 ft bgs	SD-8 9/13/2016 1-1.5 ft bgs
3,3'-Dichlorobenzidine	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
3-Nitroaniline	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
4,6-Dinitro-2-methylphenol	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
4-Bromophenyl phenyl ether	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
4-Chloro-3-methylphenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
4-Chloroaniline	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
4-Chlorophenyl phenyl ether	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
4-Methylphenol	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
4-Nitroaniline	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
4-Nitrophenol	-	-	-	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
Acenaphthene	-	-	-	µg/kg	9900 J	74000 U	81000 U	12000 U	11000 U	11000 U	4900 J	3700 U
Acenaphthylene	-	-	-	µg/kg	37000 J	74000 U	81000 U	12000 U	11000 U	11000 U	43000	1200 J
Acetophenone	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Anthracene	-	-	-	µg/kg	44000 J	74000 U	81000 U	12000 U	11000 U	11000 U	60000	1500 J
Atrazine	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Benzaldehyde	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Benzo(a)anthracene	-	-	-	µg/kg	120000	30000 J	32000 J	4800 J	11000 U	2100 J	150000	3700
Benzo(a)pyrene	-	-	-	µg/kg	120000	33000 J	27000 J	7100 J	11000 U	2000 J	130000	3600 J
Benzo(b)fluoranthene	-	-	-	µg/kg	150000	41000 J	33000 J	8200 J	1700 J	2800 J	160000	4400
Benzo(g,h,i)perylene	-	-	-	µg/kg	86000	23000 J	17000 J	7000 J	11000 U	1700 J	89000	2800 J
Benzo(k)fluoranthene	-	-	-	µg/kg	63000	17000 J	20000 J	3900 J	11000 U	11000 U	74000	2400 J
Biphenyl (1,1-Biphenyl)	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
bis(2-Chloroethoxy)methane	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
bis(2-Chloroethyl)ether	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
bis(2-Ethylhexyl)phthalate (DEHP)	<360000	>360000	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	3800 J	15000 U	1700 J
Butyl benzylphthalate (BBP)	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Caprolactam	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Carbazole	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	5400 J	3700 U
Chrysene	-	-	-	µg/kg	140000	34000 J	40000 J	5300 J	11000 U	2400 J	150000	3600 J
Dibenz(a,h)anthracene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	8000 J	3700 U
Dibenzofuran	-	-	-	µg/kg	7900 J	74000 U	81000 U	12000 U	11000 U	11000 U	9900 J	3700 U
Diethyl phthalate	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Dimethyl phthalate	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Di-n-butylphthalate (DBP)	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Di-n-octyl phthalate (DnOP)	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Fluoranthene	-	-	-	µg/kg	330000	69000 J	86000	7200 J	2400 J	4600 J	360000	9000
Fluorene	-	-	-	µg/kg	18000 J	74000 U	9900 J	12000 U	11000 U	11000 U	27000	660 J
Hexachlorobenzene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Hexachlorobutadiene	<1200	1200-12000	>12000	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Hexachlorocyclopentadiene	<810	810-8100	>8100	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Hexachloroethane	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Indeno(1,2,3-cd)pyrene	-	-	-	µg/kg	71000	19000 J	16000 J	5000 J	11000 U	1500 J	77000	2300 J
Isophorone	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Naphthalene	-	-	-	µg/kg	61000 U	74000 U	81000 U	3300 J	11000 U	11000 U	13000 J	1100 J
Nitrobenzene	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
N-Nitrosodi-n-propylamine	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
N-Nitrosodiphenylamine	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Pentachlorophenol	<14000	14000-19000	>19000	µg/kg	120000 U	140000 U	160000 U	23000 U	21000 U	21000 U	30000 U	7200 U
Phenanthrene	-	-	-	µg/kg	130000	32000 J	37000 J	4000 J	11000 U	2100 J	210000	4600
Phenol	-	-	-	µg/kg	61000 U	74000 U	81000 U	12000 U	11000 U	11000 U	15000 U	3700 U
Pyrene	-	-	-	µg/kg	270000	56000 J	69000 J	6400 J	1800 J	3900 J	290000	7100
Total PAHs	<4000	4000-35000	>35000	µg/kg	**1588900 C**	**354000 C**	**386900 C**	**62200 C**	**5900 B**	**23100 B**	**1845900 C**	**47960 C**
Total SVOCs	-	-	-	µg/kg	1596800	354000	386900	62200	5900	26900	1865100	49660
Pesticides/PCBs												
Aroclor-1016 (PCB-1016)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Aroclor-1221 (PCB-1221)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Aroclor-1232 (PCB-1232)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Aroclor-1242 (PCB-1242)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Aroclor-1248 (PCB-1248)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Aroclor-1254 (PCB-1254)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Aroclor-1260 (PCB-1260)	-	-	-	mg/kg	-	-	-	-	-	-	-	0.51 U
Total PCBs	<100	100-1000	>1000									0.51 U
4,4'-DDD	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U

Table 2.11

2016 On-Site Ditch Sediment Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Parameters	NYS Freshwater Sediment - Class A Low Risk	NYS Freshwater Sediment - Class B Slight to Moderate Risk	NYS Freshwater Sediment Class C High Risk	Units	Location ID: / Sample Date: / Depth: SD-5 9/13/2016 1-1.5 ft bgs	SD-6 9/13/2016 0-0.5 ft bgs	SD-6 9/13/2016 1-1.5 ft bgs	SD-7 9/13/2016 0-0.5 ft bgs	SD-7 9/13/2016 1-1.5 ft bgs	SD-7 9/13/2016 1-1.5 ft bgs Duplicate	SD-8 9/13/2016 0-0.5 ft bgs	SD-8 9/13/2016 1-1.5 ft bgs
4,4'-DDE	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
4,4'-DDT	<44	44-48000	>48000	µg/kg	-	-	-	-	-	-	-	7.1 U
Aldrin	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
alpha-BHC	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
alpha-Chlordane	<68	68-38000	>38000	µg/kg	-	-	-	-	-	-	-	7.1 U
beta-BHC	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
delta-BHC	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
Dieldrin	<180	180-720	>720	µg/kg	-	-	-	-	-	-	-	7.1 U
Endosulfan I	<1	1-20	>20	µg/kg	-	-	-	-	-	-	-	7.1 U
Endosulfan II	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
Endosulfan sulfate	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
Endrin	<90	90-220	>220	µg/kg	-	-	-	-	-	-	-	7.1 U
Endrin aldehyde	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
Endrin ketone	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
gamma-BHC (lindane)	<47	47-78	>78	µg/kg	-	-	-	-	-	-	-	7.1 U
gamma-Chlordane	-	-	-	µg/kg	-	-	-	-	-	-	-	7.1 U
Heptachlor	<75	75-10000	>10000	µg/kg	-	-	-	-	-	-	-	7.1 U
Heptachlor epoxide	<15	15-2100	>2100	µg/kg	-	-	-	-	-	-	-	7.1 U
Methoxychlor	<59	>59	-	µg/kg	-	-	-	-	-	-	-	2.1 J
Toxaphene	<6	6-250	>250	µg/kg	-	-	-	-	-	-	-	71 U
Metals												
Aluminum	-	-	-	mg/kg	5130 J	7390 J	11000 J	22000 J	17100 J	27100 J	7290 J	20000 J
Antimony	-	-	-	mg/kg	26.5 UJ	11.4 J	14.3 J	55.1 UJ	49.2 UJ	53.0 UJ	27.3 UJ	1.3 J
Arsenic	<10	10-33	>33	mg/kg	**24.4 B**	**21.9 B**	**65.7 C**	**25.0 B**	**51.2 C**	**62.7 C**	**11.8 B**	**42.7 C**
Barium	-	-	-	mg/kg	55.3 J	61.0 J	93.0 J	120 J	55.6 J	118 J	75.5 J	78.1 J
Beryllium	-	-	-	mg/kg	0.81	1.0	1.2	2.3	2.5	4.3	1.8	1.8
Cadmium	<1	1-5	>5	mg/kg	**3.1 B**	**25.9 C**	**28.1 C**	**1.5 B**	**21.9 J C**	**5.2 J C**	**1.2 B**	**24.6 C**
Calcium	-	-	-	mg/kg	10000	10200	5710	9310	5610	5460	2570	6780
Chromium	<43	43-110	>110	mg/kg	**74.9 J B**	**355 J C**	**274 J C**	**68.4 J B**	**106 J B**	**110 J B**	24.9 J	**82.7 J B**
Cobalt	-	-	-	mg/kg	10.4	8.1	18.9	12.2	20.0	21.0	8.1	21.0
Copper	<32	32-150	>150	mg/kg	**143 B**	**705 C**	**13100 C**	**281 C**	**1690 J C**	**381 J C**	**61.1 B**	**697 C**
Iron	-	-	-	mg/kg	25800	30700	63500	33500	116000	59600	18700	30600
Lead	<36	36-130	>130	mg/kg	**261 J C**	**9700 J C**	**8770 J C**	**280 J C**	**2320 J C**	**688 J C**	**66.9 J B**	**1390 J C**
Magnesium	-	-	-	mg/kg	3260 J	3340 J	3230 J	4600 J	3040 J	4600 J	1430 J	3760 J
Manganese	-	-	-	mg/kg	252	271	458	189	372	206	73.3	187
Mercury	<0.2	0.2-1	>1	mg/kg	**0.45 B**	**1.5 C**	**2.9 C**	**0.37 B**	**1.1 C**	**0.73 B**	**0.87 B**	**0.49 B**
Nickel	<23	23-49	>49	mg/kg	**42.2 J B**	**38.6 J B**	**156 J C**	**47.2 J B**	**80.9 J C**	**61.9 J C**	**26.0 J B**	**52.9 J C**
Potassium	-	-	-	mg/kg	1000 J	1150 J	1420 J	3210 J	1610 J	3440 J	949 J	2430 J
Selenium	-	-	-	mg/kg	2.3 J	3.2 J	2.3 J	6.7 J	9.0 J	8.9 J	4.0 J	5.4 J
Silver	<1	1-2.2	>2.2	mg/kg	1.1 U	**9.7 C**	**4.2 C**	2.2 U	**1.1 J B**	2.1 U	1.1 U	0.77 J
Sodium	-	-	-	mg/kg	247 U	300 U	330 U	514 U	459 U	495 U	255 U	290 U
Thallium	-	-	-	mg/kg	10.6 U	12.9 U	14.1 U	22.0 U	19.7 U	21.2 U	10.9 U	12.4 U
Vanadium	-	-	-	mg/kg	26.2	23.5	32.3	50.3	38.1	46.6	24.7	29.3
Zinc	<120	120-460	>460	mg/kg	**2360 C**	**2980 C**	**28100 C**	**812 C**	**5350 J C**	**1280 J C**	**293 B**	**2560 C**
General Chemistry												
Cyanide (total)	-	-	-	mg/kg	-	-	-	-	-	-	-	1.2 J
Total organic carbon (TOC)	-	-	-	mg/kg	211000 J	331000 J	179000 J	285000 J	163000 J	310000 J	451000 J	181000 J

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
ft. bgs - Feet below ground surface
PCBs - Polychlorinated Biphenyls
- - Not analyzed

Table 2.12

Tank Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Location ID:		East berm area West side of east tank	Inside center tank	Inside east tank	Inside west tank	West berm between west and center tanks	West berm east side of center tank
Sample Date:		9/15/2016	9/15/2016	9/15/2016	9/15/2016	9/15/2016	9/15/2016
Parameters	**Unit**						
Semi-volatile Organic Compounds (SVOCs)							
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2,4,5-Trichlorophenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2,4,6-Trichlorophenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2,4-Dichlorophenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2,4-Dimethylphenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2,4-Dinitrophenol	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
2,4-Dinitrotoluene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2,6-Dinitrotoluene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2-Chloronaphthalene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2-Chlorophenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
2-Methylnaphthalene	µg/kg	2100000	12000	620000	6400000	6200000	110000
2-Methylphenol	µg/kg	140000 U	8500	89000 U	320000	130000 U	2900
2-Nitroaniline	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
2-Nitrophenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
3,3'-Dichlorobenzidine	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
3-Nitroaniline	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
4,6-Dinitro-2-methylphenol	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
4-Bromophenyl phenyl ether	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
4-Chloro-3-methylphenol	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
4-Chloroaniline	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
4-Chlorophenyl phenyl ether	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
4-Methylphenol	µg/kg	280000 U	28000	170000 U	990000	260000	3500 U
4-Nitroaniline	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
4-Nitrophenol	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
Acenaphthene	µg/kg	1300000	1800 U	160000	880000	1100000	79000
Acenaphthylene	µg/kg	1500000	15000	770000	4400000	4500000	61000
Acetophenone	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Anthracene	µg/kg	3000000	14000	1300000	8300000	5400000	140000
Atrazine	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Benzaldehyde	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Benzo(a)anthracene	µg/kg	4100000	26000	1200000	14000000	6800000	210000
Benzo(a)pyrene	µg/kg	3700000	29000	970000	8800000	6600000	210000
Benzo(b)fluoranthene	µg/kg	4200000	38000	1200000	9400000	7800000	250000
Benzo(g,h,i)perylene	µg/kg	2500000	20000	450000	4800000	4200000	140000
Benzo(k)fluoranthene	µg/kg	1900000	15000	520000	7400000	3000000	100000
Biphenyl (1,1-Biphenyl)	µg/kg	700000	3500	170000	1300000	1500000	32000
bis(2-Chloroethoxy)methane	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
bis(2-Chloroethyl)ether	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Butyl benzylphthalate (BBP)	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Caprolactam	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Carbazole	µg/kg	1800000	1800 U	800000	5400000	3400000	53000
Chrysene	µg/kg	3700000	29000	1100000	49000000	6400000	180000
Dibenz(a,h)anthracene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Dibenzofuran	µg/kg	2800000	14000	1000000	5600000	5600000	130000
Diethyl phthalate	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Dimethyl phthalate	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Di-n-butylphthalate (DBP)	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Di-n-octyl phthalate (DnOP)	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Fluoranthene	µg/kg	13000000	81000	3900000	21000000	21000000	590000
Fluorene	µg/kg	3900000	23000	1700000	9400000	8000000	200000
Hexachlorobenzene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Hexachlorobutadiene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Hexachlorocyclopentadiene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Hexachloroethane	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U

Table 2.12

Tank Sample Results
Site 108 Investigation
Tonawanda Coke Corporation

Location ID:		East berm area West side of east tank	Inside center tank	Inside east tank	Inside west tank	West berm between west and center tanks	West berm east side of center tank
Sample Date:		9/15/2016	9/15/2016	9/15/2016	9/15/2016	9/15/2016	9/15/2016
Parameters	**Unit**						
Semi-volatile Organic Compounds (SVOCs)							
Indeno(1,2,3-cd)pyrene	µg/kg	2100000	18000	450000	4600000	3400000	110000
Isophorone	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Naphthalene	µg/kg	21000000	160000	5900000	56000000	42000000	540000
Nitrobenzene	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
N-Nitrosodi-n-propylamine	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
N-Nitrosodiphenylamine	µg/kg	140000 U	1800 U	89000 U	130000 U	130000 U	1800 U
Pentachlorophenol	µg/kg	280000 U	3500 U	170000 U	250000 U	250000 U	3500 U
Phenanthrene	µg/kg	16000000	100000	5900000	30000000	30000000	730000
Phenol	µg/kg	140000 U	79000	89000 U	1100000	310000	1800 U
Pyrene	µg/kg	9700000	60000	2700000	15000000	17000000	500000
Total PAHs	µg/kg	91600000	628000	28220000	242980000	167200000	4040000
Total SVOCs	µg/kg	99000000	773000	30810000	264090000	184470000	4367900

Notes:

U - Not detected at the associated reporting limit

Appendices

Appendix A
Test Pit Logs

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 1**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 14:15 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/7/2016 / 14:30PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			**Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors**	**Sample No.**	**Sample Interval**	**PID**	**Location:** North of conveyor near Niagara River shore
From	**At**	**To**					**Geologic Profile**
0.0		3.5	Fill - Soil, bare at surface, hardened tar and coal fines at surface,	TPS 1	0' to 0.2'	0.0	
			soil, gravel and cobbles deeper, loose, black, dry, becomes moist	VOCs/SVOC/Pest/PCB/metals/CN/TOC			
			with depth				
3.5		4.5	SM - Sand, some silt, gray, wet, Native	SO 1	3.5' to 4.5'	0.0	
				SVOC/metals/TOC			
	4.0		Water enters test pit from river side				
	4.5		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 2**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 13:40 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/7/2016 / 14:10 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet) From	At	To	Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** North of conveyor west of corner buildings **Geologic Profile**
0.0		1.0	Fill - soil, grass at surface, roots, coal fines, loose, black, dry	TPS 2 & 16 SVOC/metals/TOC	0' to 0.2'	0.0	
1.0		2.0	Fill - slag, vitrified, iron staining, gray, dry, very hard layer, naphthalene odor, Refusal			19.0	
	Test Pit 2a		30 feet west of TP 2 - black soil fill to 1 foot over hard slag, dry, same less odor			3.0	
	Test Pit 2b		30 feet SE of TP 2 - brown soil fill to 1.5 feet over hard slag dry, no odor			0.0	
	Test Pit 2c		40 feet SW of TP 2 - brown soil fill to 0.5 feet over hard slag dry, no odor			0.0	
	Test Pit 2d		60 feet E of TP 2 - black soil fill to 0.8 feet over hard slag, dry no odor			0.0	
	Test Pit 2e		75 feet W of TP 2 - brown soil fill to 0.7 feet over hard slag, dry no odor			0.0	
			Unable to collect deeper soil sample due to presence of hard slag layer at all test pits in this area				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 3**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 14:50 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/7/2016 / 15:05 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** West end of site east of unloader
From	**At**	**To**					**Geologic Profile**
0.0		1.3	Fill - coal fines, ashy layer, soil, red brick, loose, black, moist	TPS 3 & 17	0' to 0.2'	0.0	
				SVOC/metals/TOC			
1.3		2.7	Fill - soil, bottom ash, red brick, slag toward bottom, white and	SO 1	1.3 to 2	0.0	
			brown, dry, hard digging	SVOC/metals/TOC			
2.7		4.0	Fill - slag, hard, porous slag, gray, moist to wet, very hard digging				
4.0		4.7	SM - Sand, some silt, gray, wet, Native				
	4.0		Water enters test pit				
	4.7		Test pit end of soil in native soils				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 4**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 13:10 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/7/2016 / 13:30 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** West end of site east of unloader
From	**At**	**To**					**Geologic Profile**
0.0		3.0	Fill - coal fines, ashy layer, soil, red brick, loose, black, moist	TPS 4 & 18	0' to 0.2'	0.0	
			slight septic odor,	SVOC/metals/TOC			
3.0		4.5	Fill - ashy layer, bottom ash, white and brown, dry, compact, very hard digging				
4.5		5.5	Fill - granular layer - gray/white material, sand, loose, strong naphthalene odor, tar, light gray or white, moist	SO 3 and 4	4.5' to 6'	42.0	
				VOCs/SVOC/Pest/PCB/metals/CN/TOC			
5.5		6.5	Fill - soil fill, wood, rubber, brick, sand, light gray, moist to wet, chemical odor				
6.5		9.0	SM - Sand, some silt, little clay, gray, wet, chemical odor, Native				
	6.5		Water enters test pit				
	9.0		Test Pit end of hole in native soils				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 5**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 10:40 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/7/2016 / 11:15 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** West end of site west of tree line
From	**At**	**To**					**Geologic Profile**
0.0		1.0	Fill - soil, grass at surface, roots, loose, brown, dry	TPS 5 & 19 SVOC/metals/TOC	0' to 0.2'	0.0	
1.0		2.0	Fill - slag, porous, vitrified, iron and iron staining, light gray and rusty brown, dry, very hard digging, refusal at 2 feet				
	Test Pit 5a		Move 25 feet north to Test Pit 5a - Soil fill to 1 foot, then hard slag				
	Test Pit 5b		Move 25 feet east to Test Pit 5b - soil fill to 3 feet over hard slag				
			Move 50 feet southwest of Test Pit 5 for Test Pit 5c - separate log				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 5c**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 11:20 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/7/2016 / 12:00 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** West end of site west of tree line
From	**At**	**To**					**Geologic Profile**
0.0		1.5	Fill - soil, grass at surface, roots, loose, brown and black, dry			0.0	
1.5		4.7	Fill - soil, ash, bottom ash, coal, ceramic, iron staining, red-brown rusty brown and black, dry, very hard digging, refusal at 2 feet	SO 5 SVOC/metals/TOC	3' to 4'	0.6	
4.7		6.0	SM - Sand, little silt, little clay toward 6 ft., soft, lt. gray to gray, wet Native			0.0	
	5.0		Water enters test pit				
	6.0		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 6**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 12:30 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/7/2016 / 13:00 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Location: SW corner of site near embayment
From	At	To					Geologic Profile
0.0		3.0	Fill - soil, grass at surface, roots, concrete rubble, bricks, iron, loose, brown, dry	TPS 5 & 19 SVOC/metals/TOC	0' to 0.2'	0.0	
3.0		5.0	Fill - CL - clay, reworked, glass, red brick, rusty staining, red-brown and brown, dry to moist	SO 6 SVOC/metals/TOC	3' to 4'	0.0	
5.0		6.0	SM - Sand, little silt, little clay toward 6 ft., soft, lt. gray to gray, wet Native			0.0	
	5.0		Water enters test pit				
	6.0		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 7**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 10:00 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/7/2016 / 10:30:00 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** Near creek SW of tanks
From	**At**	**To**					**Geologic Profile**
0.0		6.0	Fill - coal fines, soil, red brick, wood, white brick, black plastic	TPS 7 & 21	0' to 0.2'	0.0	
			sheeting, coal tar odor, black, dry	SVOC/metals/TOC			
	3.0		Coal tar piece (2 ft. by 2 ft.), congealed but flowable in heat.			3.0	
6.0		7.7	ML - Silt, little sand and clay, tar in root channels, rootlets, gray,	SO 7	6.0' to 7.0'	63.0	
			sl. stiff, gray, Native	SVOC/metals/TOC			
7.7		8.7	SM - Sand, some silt, rootlets, moist, gray, coal tar odor, trace tar				
	6.0		Water enters test pit				
	8.7		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 8**
Project No.:	**002428**			**Date/Time Started:**	**9/6/2016 / 9:30 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/6/2016 / 10:20:00 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** SW part of site Geologic Profile
From	At	To					
0.0		3.0	Fill - SM - Sand, little silt, little brick, loose, brown, dry, roots from surface vegetation, Fill	TPS 8 &22 SVOC/metals/TOC	0' to 0.2'	0	
3.0		6.5	Fill - Soil and ash, white brick, plastic chunks (3 to 10 inches), white plastic cylinders (1/4 inch dia. and 1/2 to 3 inches long), wood, rusted metal, paper, rubber, glass, white pasty material, furnace bottoms, loose, brown, black and gray, dry at top, moist toward bottom	SO 21 SVOC/metals/TOC	3.5' to 6.5'	4.7	
6.5		9.0	SM - Sand, some silt, gray, moist to wet, Native				
	6.5		Water enters test pit			1	
	9.0		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
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Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 9**
Project No.:	**002428**			**Date/Time Started:**	**9/6/2016 / 10:30 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/6/2016 / 11:30:00 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** S central part of site Geologic Profile
From	At	To					
0.0		3.0	Fill - SM - Sand, little silt, little brick, metal rebar, loose, brown, dry, roots from surface vegetation	TPS 9 & 23 SVOC/metals/TOC	0' to 0.2'	0	
3.0		4.0	Fill - Soil, brick, concrete rubble, (1 to 2 foot pieces), very hard, dry				
4.0		8.0	Fill - ML -Silt, some red-brown clay, trace concrete, trace brick, stiff, dark brown, moist toward bottom				
8.0		9.0	Fill - Ash, asphaltic tar, coal, red brick, furnace bottoms, stiff, black, moist	SO 9 SVOC/metals/TOC	8.0 to 9.0	1.6	
	8.5		becomes softer				
9.0		12.0	Fill - ML - Silt, some sand, brick, hardened tar, coal fines, brown grades to dark gray or black, moist			0	
	12.0		Water enters test pit				
	12.0		End of test pit - still in fill				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 10**
Project No.:	**002428**			**Date/Time Started:**	**9/6/2016 / 14:40 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/6/2016 / 15:00 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Location: S central part of site
From	At	To					Geologic Profile
0.0		2.0	Fill - SM - Sand, little silt, little brick, loose, brown, dry, roots from surface vegetation	TPS 10 & 24 SVOC/metals/TOC	0' to 0.2'	0.0	
2.0		5.0	Fill - Soil, dense, dark brown, dry to moist				
5.0		8.0	Fill - Clayey soil and ash layers, black, moist, anaerobic odor			1.3	
8.0		12.0	Fill - Soil, ash, ash layers, white brick, white pasty material, plastic beads (1/8 inch square) in bags, plastic cylinders (1/4 inch dia. x 1/2 to 3 inches long), wood, rusted metal, metal, bottles, pasty white material, furnace bottoms, black to gray, dry at top, moist toward bottom, chemical odor	SO 9 VOCs/SVOC/Pest/PCB/metals/CN/TOC	8.0 to 9.0	57.0	
	12.0		Water enters test pit				
	12.0		End of test pit - still in fill				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 11 and 11a**
Project No.:	**002428**			**Date/Time Started:**	**9/6/2016 / 15:10 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/6/2016 / 15:30 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			**Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors**	**Sample No.**	**Sample Interval**	**PID**	**Location:** S central part of site
From	**At**	**To**					**Geologic Profile**
0.0		3.0	Fill - SM - Sand, little silt, little brick, loose, brown, dry, roots from surface vegetation	TPS 11 & 25 SVOC/metals/TOC	0' to 0.2'	0.0	
2.0		9.0	Fill - Brick, concrete, soil, dry				
			Hole unstable and edges collapse with bricks falling into hole.				
			Move 40 ft. NW - Test Pit 11a - soil to 2 feet, with bricks and soil to 6 feet. Hole again is not stable. Backfill both test pits.				
			Move 175 feet east to Test Pit 11b				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 11b**
Project No.:	**002428**			**Date/Time Started:**	**9/6/2016 / 15:40 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/6/2016 / 16:10 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Location: SE part of site Geologic Profile
From	At	To					
0.0		3.5	Fill - SM - Sand, little silt, little brick, loose, lt. brown and gray, dry, roots from surface vegetation				
2.0		12.0	Fill - SM - Sand and silt, little clay, brick, metal, gray, dry			0.0	
12.0		13.0	Fill - coal fines, ashy layer, black, dry,	SO 18	12'-13'	0.6	
13.0		14.4	CL - Clay, little silt and fine sub-rounded gravel, red brown, dry, Native			0.2	
	14.4		Test pit end of hole in native soil No water observed in test pit				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 12**
Project No.:	**002428**			**Date/Time Started:**	**9/6/2016 / 16:20 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/6/2016 / 16:50 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** E central part of site **Geologic Profile**
From	**At**	**To**					
0.0		10.0	Fill - Soil with sand, silt, coal fines, red and white brick,clay, wood, concrete, plastic, glass, red-brown, brown and black, dry to moist	TPS 12 VOCs/SVOC/Pest/PCB/metals/CN/TOC	0' to 0.2'	0.0	
10.0		12.5	Cl - Clay, little silt, little m/l subround gravel, very stiff, red-brown and gray, moist, Native.	SO 17 SVOC/metals/TOC	10' to 12'	0.0	
	12.5		Test pit end of hole in native soil Some wet soil in last bucket. No water observed in test pit.				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 13**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 13:45 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/8/2016 / 14:15 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** East end of site - south side
From	**At**	**To**					**Geologic Profile**
0.0		3.0	Fill - ML - Silt, little silt, little brick, loose, brown, dry,	TPS 13 & 26	0 to 0.2'	0.0	
			roots from surface vegetation				
3.0		4.5	Fill - CL - Clay, little silt, dense, red brown, dry to moist, reworked			0.0	
4.5		7.0	CL - clay, little silt, shell fragments, sub-round f/m gravel, soft	SO 10	6.5' to 7.0'	0.0	
			gray with black staining, moist to wet, Native				
						0.0	
	7.0		5 to 6 inch diameter log lying horizontal in test pit				
	7.0		Water at bottom				
	7.0		Test pit end of hole in native soil				
			Note: Test pit faces vary. West face shows all loose brown soil, East				
			shows horizontal layering as above. The south and north sides have				
			loose brown soil over red-brown clay starting 3 foot below surface				
			angling downward toward the west to 7 feet on the west face. The red				
			clay is above a gray silty clay layer which begins at 4.5 foot on the east				
			face, also angling downward at about a 40 degree angle. The gray silty				
			clay ends on the floor of the test pit and does not reach the west face.				
			It is believed that this test pit lies in the path of the old Erie Canal.				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 14**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 12:30 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/8/2016 / 13:00 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet) From	At	To	Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour,	Sample No.	Sample Interval	PID	Location: East end of site, north side, nearest to access road Geologic Profile
0.0		3.0	Fill - ML - Silt, little silt, little brick, loose, brown, dry,	TPS 14 & 27	0 to 0.2'	0.0	
			roots from surface vegetation				
3.0		7.0	Fill - CL - Clay, little silt, dense, red brown, dry to moist, reworked			0.0	
	3.5		Red bricks				
	4.0	4.9	Fill - Ashy layer extending eastward (not present on west face)	SO 11	4.0' to 4.9'	0.0	
			gray with black staining, moist to wet, Native				
						0.0	
	7.0		large angular rocks of 1 to 3 foot dimension and wooden timbers present,				
			soil is gray silty clay				
	7.0		Water at bottom				
	7.0		Test pit end of hole in native soil				
			Note: Test pit faces vary. East face logged above. West face shows				
			brown soil to 18 inches, red-brown clay to 4 feet, then a gray silty clay				
			to 7 feet. The south and north sides have loose brown soil over red-brown				
			clay at 3 feet on the west side angling downward toward the east.to 7 feet				
			at the east face. The reb-brown clay is above a gray silty clay layer which				
			begins at 4.5 feet on the west side, angling downward toward the east.				
			There is only a thin layer of gray silty clay on the east face, where large				
			rocks and timber was encountered. It is believed that this test pit lies in				
			the path of the old Erie Canal				

Test Pit Stratigraphy Log
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Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 15**
Project No.:	**002428**			**Date/Time Started:**	**9/7/2016 / 9:00 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/6/2016 / 9:45 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Location: East of tanks on north side of site

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Geologic Profile
From	At	To					
0.0		1.5	Fill - Soil with red-brown clay, coal fines, coke, large hardened tar	TPS 15 & 28	0' to 0.2'	0.0	
			piece (6 inch thick x 2 to 3 ft. long), brick, brown to black, dry	SVOC/metals/TOC		8.0 (tar)	
1.5		4.0	Fill - slag, porous, vitrified, some darker soil fines, light gray, dry,	SO 8	1.5' to 3.0'	0.5	
			very hard digging	SVOC/metals/TOC			
	3.5		Water enters test pit				
	4.0		End of test pit - still in slag				
			Note: On 9/8/16 a NYSDEC Radiation Specialist measured the				
			radioactivity of the slag at this location.				
			Readings were measured as follows:				
			- test pit side wall alongside the in-situ slag - 30 KCPM				
			- pile of slag excavated from test pit - 23 KCPM				
			- individual piece of slag - 16 KCPM				
			Site background was measured at 5 to 8 KCPM				
			KCPM = Thousand Counts Per Minute				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 16**
Project No.:	**002428**			**Date/Time Started:**	**9/28/2016 / 9:45 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/28/2016 / 10:15 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** Breeze area SW Test Pit
From	**At**	**To**					**Geologic Profile**
0.0		5.0	Fill - coal fines, ashy layer, coke pieces, coal, soil, black, dry			0.0	
			slight naphthalene odor				
5.0		14.0	Fill - soil, yellow bricks, coal fines, trace slag, general fill,			17.5	
			black to brown, moist to wet, naphthalene odor				
14.0		14.5	SM - Sand, some silt, gray, moist to wet, chemical odor, Native	SO 001	14.0' to 14.5'	42.0	
				SVOC/Metals/TOC			
	8.5		Water enters test pit				
	14.5	+/-	Test pit end of hole in native soils				

Test Pit Stratigraphy Log
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Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 17**
Project No.:	**002428**			**Date/Time Started:**	**9/28/2016 /10:20 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/28/2016 / 10:40 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** Breeze area SE Test Pit
From	**At**	**To**					**Geologic Profile**
0.0		3.0	Fill - coal fines, coke pieces, coal, soil, black, dry			0.0	
3.0		7.5	Fill - soil, yellow bricks, coal fines, metal, wood, metal pipe, large white ceramic pieces, black to brown, moist to wet, fuel oil odor			7.2	
7.5		7.7	SM - Sand, some silt, gray, moist to wet, chemical odor, Native				
7.7		8.5	CL - Clay, some silt, little sand, soft, red-brown, moist, slight odor	SO 002 SVOC/Metals/TOC	8.0' to 8.5'	2.6	
	7.0		Water enters test pit				
	8.5		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
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Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 18**
Project No.:	**002428**			**Date/Time Started:**	**9/28/2016 / 10:45 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/28/2016 / 11:00 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** Breeze area central Test Pit
From	**At**	**To**					**Geologic Profile**
0.0		3.0	Fill - coal fines, coke pieces, coal, soil, black, dry			0.0	
3.0		9.0	Fill - coal fines, coal, coke, soil, yellow bricks, wood, black to brown, moist to wet, fuel oil odor/naphthalene odor			3.0	
9.0		11.0	SM - Sand - f/m, some silt, gray, wet, fuel oil odor, Native	SO 003 SVOC/Metals/TOC	9.0' to 9.5'	0.4	
	9.0		Water enters test pit				
	11.0		Test pit end of hole in native soils				

Test Pit Stratigraphy Log
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Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit 19**
Project No.:	**002428**			**Date/Time Started:**	**9/28/2016 / 11:10 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/28/2016 / 11:40 AM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** Breeze area North Test Pit
From	**At**	**To**					**Geologic Profile**
0.0		5.0	Fill - coal fines, coke pieces, coal, soil, tar, brick, log at 5', white pasty material, black, dry, strong chemcial odor			160.0	
5.0		7.0	SM - Sand-f/m, little silt, gray with black staining, moist to wet strong Naphthalene odor, Native	SO 004 SVOC/Metals/TOC	5.0' to 5.5'	50.0	
	4.0		Water enters test pit				
	5.0		Water enters test pit				
	7.0		Test pit end of hole in native soils				

Appendix B
River Sediment Logs

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**		NA	**Hole designation:**	SR-1
Project number:	2428	**Driller:**		NA	**Date/Time started:**	9/21/16 / 09:45 AM
Client:	Hodgson Russ	**Surface elevation:**			**Date/Time completed:**	9/21/16 / 10:10 AM
Location:	Tonawanda, NY	**Weather**	**(A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
			(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: **Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.**			**Penetration Record Split Spoon Blows Record N-Values & Recoveries**									
From	**At**	**To**	**Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).**	**Sample Number**	**Sampling Method**	**6"**	**6"**	**6"**	**6"**	**N**	**R**	**Sample Interval**	**PID/FID (ppm)**	**Chemical Analysis**	**Grain Size/ Other Analysis**
0.0		**1.0**	**SM - Sand, some silt, fine grained, trace furnace bottom ash, trace coal, trace**	**SR-001**	**Hand auger**							**0 to 0.5'**		**SVOC/Metals/ TOC**	
			round to subround f/m gravel, trace shell fragments, gray, wet, alluvial												
1.0		**3.0**	**SW - Sand, fine grained, trace silt, trace shell fragments, black flecks,**	**SR-002**	**Hand auger**							**1.5' to 2.0'**		**SVOC/Metals/ TOC**	
			gray, wet	**SR-003**	**Hand auger**							**2.5' to 3.0'**		**SVOC/Metals/ TOC**	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 15 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-2
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 10:20 AM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 10:45 AM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.			Penetration Record Split Spoon Blows Record N-Values & Recoverie									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)	Chemical Analysis	Grain Size/ Other Analysis
0.0		0.5	SM - Sand, little silt, f/m grained, abundant shell fragments, 1 piece	SR-004	Hand auger							0 to 0.5'		VOC/SVOC/Pest/ PCB/metals/ CN/TOC	
			furnace bottom ash, trace sub-round medium gravel, dark gray, wet, alluvial												
0.5		2.5	SW - Sand, trace silt, f/m grained, shell fragments, light gray, wet,	SR-005	Hand auger							1.5' to 2.0'		SVOC/Metals/ TOC	
			sulfide odor												
2.5		3.0	SW - Sand, little silt, fine grained, trace medium rounded gravel, dark	SR-006	Hand auger							2.5' to 3.0'		SVOC/Metals/ TOC	
			gray with black inclusions, wet												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 30 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-3
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 10:50 AM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 11:30 AM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Andrew Martin

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details										Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content,			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)		
0.0		0.5	SW - Sand, medium grained, trace shell fragments, black flecks, trace	SR-007	Hand auger							0 to 0.5'		SVOC/Metals/ TOC	
			coal, bottom ash, glass, dark gray, wet, alluvial												
1.0		3.0	SW - Sand, medium grained, little fine rounded gravel, gray, wet	SR-008	Hand auger							1.5' to 2.0'		SVOC/Metals/ TOC	
				SR-009	Hand auger							2.5' to 3.0'		SVOC/Metals/ TOC	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 15 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-4
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 12:15 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 12:50 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details										Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content,			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)		
0.0		0.5	SW - Sand, medium to coarse grained, little coal, black, wet, granular	SR-010	Hand auger							0 to 0.5'		SVOC/Metals/ TOC	
			sulfide odor												
0.5		1.3	SW - Sand, medium grained, trace fine sub-rounded gravel, dark gray												
			with black inclusions, wet												
1.3		3.0	SW - Sand, fine grained, light gray and brown, wet	SR-011	Hand Auger							1.5' to 2.0'		SVOC/Metals/ TOC	
				SR-012	Hand Auger							2.5' to 3.0'		SVOC/Metals/ TOC	
	2.5		some sulfide odor												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 15 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-5
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 13:00 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 13:30 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details										Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content,			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)		
0.0		0.75	SP - Sand, medium to coarse grained, shell fragments, brown and gray	SR-013	Hand auger							0 to 0.5'		SVOC/Metals/ TOC	
			wet, slight sulfide odor, alluvial												
0.75		2.8	SW - Sand, fine grained, trace fine rounded gravel, shell fragments,	SR-014	Hand auger							1.5' to 2.0'		SVOC/Metals/ TOC	
			gray, wet	SR-015	Hand auger							2.5' to 2.8'		SVOC/Metals/ TOC	
	1.5		large piece of broken glass in hand auger												
	2.75		becomes fine to medium grained, very dense												
	2.8		Unable to auger further - dense material												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 12 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-6
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 13:40 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 14:00PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Andrew Martin

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details										Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content,			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)		
0.0		0.8	Fill - coarse, slag, furnace bottom ash, coarse coal fines, black, wet	SR-016	Hand auger							0 to 0.5'		SVOC/Metals/ TOC	
0.8		3.0	SW Sand, well sorted, gray-brown, wet, alluvial	SR-017	Hand auger							1.5' to 2.0'		SVOC/Metals/ TOC	
	2.5		slight sheen apparent on soil core	SR-018	Hand auger							2.5' to 3.0'		SVOC/Metals/ TOC	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 24 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-7
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 14:10 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 14:45 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Andrew Martin

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details										Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content,			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)		
0.0		0.5	SW Sand, medium grained, gray with dark inclusions, shell	SR-019	Hand auger							0 to 0.5'		VOC/SVOC/Pest/ PCB/Metals/CN/ TOC	
			fragments, wet, alluvial												
0.5		0.7	Fill - coarse coal fines, no soil fines, black, wet												
0.7		0.8	leafy mat - about 1 inch thick, wet, decayed												
0.8		1.5	SM Sand, some silt, little f/m gravel, black to												
			dark gray, wet												
1.5		3.0	SW Sand, fine grained, shell fragments, trace rounded gravel,	SR-020	Hand auger							1.5' to 2.0'		SVOC/Metals/ TOC	
			light gray and brown, wet, slight sulfide odor	SR-021	Hand auger							2.5' to 3.0'		TOC	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 24 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SR-8
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/21/16 / 14:50 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/21/16 / 15:30 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details										Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.			Penetration Record Split Spoon Blows Record N-Values & Recoverie									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID/FID (ppm)		
0.0		0.7	SW - Sand, fine to medium grained, shell fragments, trace subround f.	SR-022 and SR-024	Hand auger							0 to 0.5'		SVOC/Metals/ TOC	
			gravel, wet, alluvial, sl. sulfide odor												
0.7		1.5	SW - Sand, fine grained, trace fine sub-rounded gravel, shell fragments,												
			brown and gray with black inclusions, wet, slight to some petroleum odor												
	1.5		sheen at bottom of soil core												
1.5		3.0	SM - Sand, fine grained, little silt, dark gray, wet, petroleum odor, sheen on	SR-023	Hand Auger							1.5' to 2.0'		VOC/SVOC/Pest/ PCB/Metals/CN/ TOC	
			soil core												
				SR-025	Hand Auger							2.5' to 3.0'		SVOC/Metals/ TOC	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from Niagara River. Sediment falls back into hole throughout augering. Water depth of river about 15 inches

Appendix C
Ditch Sediment Logs

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-1
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 10:00 AM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 10:30 AM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand push of sediment coring tube
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: **Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.**			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	**Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).**	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID (ppm)	Chemical Analysis	Grain Size/ Other Analysis
0.0		0.4	**ML - Silt, little fine sand, soft, black, wet**	SD-001	Sediment corer							0 to 0.4'	0.0	SVOC/Metals/ TOC	
0.4		0.7	**GM - fine Gravel with silt fines, decayed vegetation, compact, black, wet**												
0.7		1.9	**ML - Silt, little fine sand, soft, black, wet, burnt rubber odor**	SD-002	Hand auger							1.0' to 1.5'	0.2	SVOC/Metals/ TOC	
1.9		2.0	**ML - Silt, some clay, stiff, gray and brown, moist to wet**												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from drainage ditch. Water level at sample location about 8 inches

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-2
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 10:40 AM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 11:00 AM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand push of sediment coring tube
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: **Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.**			**Penetration Record Split Spoon Blows Record N-Values & Recoveries**									
From	**At**	**To**	**Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).**	**Sample Number**	**Sampling Method**	**6"**	**6"**	**6"**	**6"**	**N**	**R**	**Sample Interval**	**PID (ppm)**	**Chemical Analysis**	**Grain Size/ Other Analysis**
0.0		**0.5**	**ML - Silt, little fine sand, roots and vegetative matter, soft, black, wet, soft**	**SD-003**	**Sediment corer**							**0 to 0.4'**	**22.8 headspace**	**SVOC/Metals/ TOC**	
			sticky tar present												
1.0		**1.5**	**ML - Silt, some clay, trace gravel, roots, dark gray, firm, moist, tar present**	**SD-004**	**Sediment corer**							**1.0' to 1.5'**	**10.1 headspace**	**SVOC/Metals/ TOC**	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from drainage ditch near TP-7 location. Water level at sample location about 8 inches

Tar present on creek bottom at north bank. Metallic sheen noted on water surface.

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-3
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 11:30 AM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 12:00 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand push of sediment coring tube
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: **Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.**			**Penetration Record Split Spoon Blows Record N-Values & Recoveries**									
From	**At**	**To**	**Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).**	**Sample Number**	**Sampling Method**	**6"**	**6"**	**6"**	**6"**	**N**	**R**	**Sample Interval**	**PID (ppm)**	**Chemical Analysis**	**Grain Size/ Other Analysis**
0.0		**0.4**	**ML - Silt, soft, black, wet, slight burnt rubber odor**	**SD-005**	**Sediment corer**							**0 to 0.4'**	**0.0 headspace**	**SVOC/Metals/ TOC**	
1.0		**1.5**	**ML - Silt, black, soft to firm, wet, slight greasy odor**	**SD-006**	**Sediment corer**							**1.0' to 1.5'**	**0.5 headspace**	**SVOC/Metals/ TOC**	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from pond along drainage ditch. Water level at sample location about 15 inches.

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-4
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 15:15 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 15:45 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand push of sediment coring tube
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: **Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.**			**Penetration Record Split Spoon Blows Record N-Values & Recoveries**									
From	**At**	**To**	**Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).**	**Sample Number**	**Sampling Method**	**6"**	**6"**	**6"**	**6"**	**N**	**R**	**Sample Interval**	**PID (ppm)**	**Chemical Analysis**	**Grain Size/ Other Analysis**
0.0		**0.4**	**ML - Silt, trace slag pieces, trace coal pieces, soft, black, wet, slight burnt**	**SD-007**	**Sediment corer**							**0 to 0.4'**	**10.2 headspace**	**VOC/SVOC/Pest/ PCB/Metals/CN/ TOC**	
			rubber odor												
1.0		**1.5**	**SM-ML - Silt, some sand - fine to coarse, black, soft to firm, wet, slight**	**SD-008**	**Sediment corer**							**1.0' to 1.5'**	**1.6 headspace**	**SVOC/Metals/ TOC**	
			greasy odor												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from drainage ditch at channel split east of pond. One channel goes to south side wetlands - no flow; one channel goes toward access road, with flow.
Water level at sample location about 10 inches.

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-5
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 13:00 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 13:30 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand push of sediment coring tube
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID (ppm)	Chemical Analysis	Grain Size/ Other Analysis
0.0		0.4	SM-ML - Silt, some sand - fine to medium, black, soft, wet, slight burnt	SD-009	Sediment corer							0 to 0.4'	0.0 headspace	SVOC/Metals/ TOC	
			rubber odor												
			There is a distinct firmer layer about 6 inches deep												
1.0		1.5	SM-ML - Silt, trace sand - fine grained, roots, black, soft, wet, slight	SD-010	Sediment corer							1.0' to 1.5'	0.0 headspace	SVOC/Metals/ TOC	
			sulfide odor												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from kettle-hole along drainage ditch near access road. Most of kettle hole has firm bottom which has a distinct break to a very soft area on the southeast side.

Water level at sample location about 12 inches. Minnows and crayfish noted in area.

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-6
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 14:15 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 14:45 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand push of sediment coring tube
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.			Penetration Record Split Spoon Blows Record N-Values & Recoveries										
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID (ppm)		
0.0		0.4	ML - Silt, black, soft, wet, slight odor	SD-011	Sediment corer							0 to 0.4'	0.3 headspace	SVOC/Metals/ TOC	
1.0		1.5	ML - Silt, little clay, rootlets, tree wood, black, soft, wet, slight petroleum	SD-012	Sediment corer							1.0' to 1.5'		SVOC/Metals/ TOC	
			odor, rainbow sheen noted on creek surface after sampling												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from drainage ditch near access road.

Water level at sample location about 10 inches. Crayfish noted in area.

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA			**Hole designation:**	SD-7
Project number:	2428	**Driller:**	NA			**Date/Time started:**	9/13/16 / 15:45 PM
Client:	Hodgson Russ	**Surface elevation:**				**Date/Time completed:**	9/13/16 / 16:15 PM
Location:	Tonawanda, NY	**Weather**	**(A.M.):**	Clear 75° F		**Drilling method:**	Hand Auger
			(P.M.):	Clear 80° F		**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											
			Order of descriptors: **Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.**			Penetration Record Split Spoon Blows Record N-Values & Recoveries									
From	**At**	**To**	**Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).**	**Sample Number**	**Sampling Method**	**6"**	**6"**	**6"**	**6"**	**N**	**R**	**Sample Interval**	**PID (ppm)**	**Chemical Analysis**	**Grain Size/ Other Analysis**
0.0		**0.4**	**ML-PT - Silt, decayed organic material, abundant roots, black, loose, wet**	**SD-013**	**Hand Auger**							**0 to 0.4'**	**0.5**	**SVOC/Metals/ TOC**	
1.0		**1.5**	**ML-PT - Silt, decayed organic material, black gray and brown, firm, moist to**	**SD-014 & 017**	**Hand Auger**							**1.0' to 1.5'**	**2.3**	**SVOC/Metals/ TOC**	
			wet												

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from wetland area south side of site.

No water present at sample location. Fragmites and cat tails present.

Stratigraphy Log (Overburden)
(Form SP-14)

Project name:	Tonawanda Coke Site 108	**Drilling contractor:**	NA	**Hole designation:**	SD-8
Project number:	2428	**Driller:**	NA	**Date/Time started:**	9/13/16 / 15:45 PM
Client:	Hodgson Russ	**Surface elevation:**		**Date/Time completed:**	9/13/16 / 16:15 PM
Location:	Tonawanda, NY	**Weather (A.M.):**	Clear 75° F	**Drilling method:**	Hand Auger
		(P.M.):	Clear 80° F	**GHD supervisor:**	Kevin Lynch

Stratigraphic Intervals (Depths in ft/m BGS)			Sample Description	Sample Details											Chemical Analysis	Grain Size/ Other Analysis
			Order of descriptors: Soil type symbol(s) - primary component(s), (nature of deposit), secondary components, relative density/consistency, grain size/plasticity, gradation/structure, colour, moisture content, supplementary descriptors.			Penetration Record Split Spoon Blows Record N-Values & Recoveries										
From	At	To	Note: Plasticity determination requires the addition of moisture if the sample is too dry to roll (indicate if moisture was added or not).	Sample Number	Sampling Method	6"	6"	6"	6"	N	R	Sample Interval	PID (ppm)			
0.0		0.4	Fill - coal fines, ashy soil, iron staining, firm, black with brown, dry to moist	SD-013	Hand Auger							0 to 0.4'	3.2	SVOC/Metals/ TOC	
1.0		1.5	ML-Silt, soft, gray, moist to wet, slight odor	SD-014 & 017	Hand Auger							1.0' to 1.5'	3.6	VOC/SVOC/Pest/ PCB/Metals/CN/ TOC	

Notes and Comments

Depth of borehole caving _____ Depth of first groundwater encounter _____ Topsoil thickness _____

Water level in open borehole on completion _____ After _____ Hours _____

Notes: Sediment sample from wetland area south side of site.

No water present at sample location. Fragmites and cat tails present.

Appendix D
Tank Farm Investigation Logs

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B1**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 15:00 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/8/2016 / 15:10 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Location: West tank berm West side
From	At	To					Geologic Profile
0.0		2.0	Fill - CL - Clay, some silt, little fine subround gravel, red-brown, dry,				
			Reworked clay used as berm material				
2.0		3.0	Fill - slag, very hard, porous, wet				
	2.5		Water enters test pit				
	3.0		End of test pit				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B1a**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 15:00 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/8/2016 / 15:20 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Location: West tank berm West side 40 feet south of Test Pit B1

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Geologic Profile
From	At	To					
0.0		3.0	Fill - CL - clay, dense, red-brown, dry, roots			0.0	
3.0		4.5	Fill - soil fill, white fibrous material, white, red and yellow bricks, brown, dry			0.0	
4.5		7.5	Fill - coal fines, coke, coal, black, dry to moist	SO 12	5' to 6'	0.4	
	7.0		becomes wet	SVOCs only			
	7.0		Water enters test pit				
	7.5		End of test pit				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B2**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 15:30 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/8/2016 / 16:00 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** West tank berm North side Near former tank pump house
From	**At**	**To**					**Geologic Profile**
0.0		1.5	Fill - CL - Clay, some silt, little fine subround gravel, red-brown, dry, Reworked clay used as berm material			0.0	
1.5		5.0	Fill - coal fines, coke pieces, coal, yellow and red brick, gray slag, black, moist to wet			6.2	
5.0		6.0	CL-ML - Silty clay, few thin sand lenses, gray, moist to wet	SO 13	5' to 6'	0.7	
	5.0		Water enters test pit				
	6.0		End of test pit				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B3**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 16:30 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/8/2016 / 16:50 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** East tank berm East side **Geologic Profile**
From	**At**	**To**					
0.0		5.0	Fill - CL - Clay, some silt, little fine subround gravel, red-brown, dry,				
			Reworked clay used as berm material				
5.0		5.4	Fill - coal fines, coke pieces, coal, black, moist	SO 14	5' to 5.4 '		
				SVOCs only			
5.4		7.6	ML - Silt, little sand, gray, moist to wet, Native				
	7.6		Test pit end of hole in Native soil				
			No water observed in test pit				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B4**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 17:00 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/8/2016 / 17:30 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Andrew Martin**

Location: East tank berm North side

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Geologic Profile
From	At	To					
0.0		2.5	Fill - CL - Clay, some silt, little fine subround gravel, red-brown, dry,				
			Reworked clay which was used as berm material				
2.5		4.5	Fill - coal fines, coke pieces, coal, black, concrete, wood, moist	SO 15	3.5' to 4.5'	0.0	
				SVOCs only			
	4.5		Water enters test pit				
	4.5		end of test pit -still in fill				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B5**
Project No.:	**002428**			**Date/Time Started:**	**9/8/2016 / 17:30 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/8/2016 / 18:15 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Location: West tank berm South side

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Geologic Profile
From	At	To					
0.0		3.0	Fill - soil, roots, red and yellow brick, concrete, wood, flat block, coal fines, black and dark brown, dry				
3.0		3.3	Vegetative mat,				
3.3		7.0	ML - Silt, little sand, dense, dark brown, dry to moist, Native				
7.0		8.0	Sm - Sand, little silt, loose, gray, wet, Native	SO 16	7.0' to 8.0'		
	7.0		Water enters test pit				
	8.0		Test pit end of hole in Native soil				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B6**
Project No.:	**002428**			**Date/Time Started:**	**9/9/2016 / 11:45 AM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed:**	**9/9/2016 / 12:15 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Location: East tank berm South side

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Geologic Profile
From	At	To					
0.0		3.0	Fill - soil, silty, red brick, roots, wood, white brick, dark brown, dry			0.0	
3.0		5.5	Fill - soil with tar, coke pieces, coal, clinkers, black and dark gray	SO-22	4.0' to 5.0'	130.0	
			moist to wet, strong coal tar and naphthalene odor, tar is not	VOC/SVOC/pest/PCB/metals/CN/TOC			
			congealed, granules are flowable				
5.5		5.8	Vegetative mat, thick, dense, reed stalks, black, moist to wet, odors				
			Native				
5.8		7.0	ML - Silt, some sand, med. stiff, silt, rootlets, gray-brown, moist	SO-23	6.0' to 6.5'	46.0	
			coal tar odor, naphthalene odor, no visible tar	VOC/SVOC/pest/PCB/metals/CN/TOC			
	4.0		water enters test pit from NW corner and south side				
	7.0		Test pit ends in native soils				
			Move 15 feet SW for Test Pit B6a				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B6a**
Project No.:	**002428**			**Date/Time Started:**	**9/9/2016 / 12:20 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/9/2016 / 12:30 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	**Location:** East tank berm South side 15 feet SW of Test Pit B6
From	**At**	**To**					**Geologic Profile**
0.0		3.0	Fill - soil with tar, coke pieces, coal, clinkers, loose, black and dark gray			190.0	
			moist to wet, strong coal tar and naphthalene odor, tar is not congealed,				
			granules are flowable				
	3.0		No water observed				
	3.0		Test pit ends due to obvious tar impact.				
			Move 15 feet SW for Test Pit B6b				

Test Pit Stratigraphy Log
(Form SP-03)

Project Name:	**Tonawanda Coke Site 108**	**Contractor:**	**TCC**	**Test Pit Designation:**	**Test Pit B6b**
Project No.:	**002428**			**Date/Time Started:**	**9/9/2016 / 12:50 PM**
Client:	**Hodgson Russ**	**Surface Elevation:**		**Date/Time Completed**	**9/9/2016 / 13:30 PM**
Location:	**Tonawanda, New York**	**Test Pit Method:**	**Excavator**	**GHD Supervisor:**	**Kevin Lynch**

Depth (Feet)			Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	PID	Location: East tank berm South side 30 feet SW of Test Pit B6 15 feet SW of Test Pit B6a
From	At	To					Geologic Profile
0.0		4.0	Fill - soil, silty, coal, coke pieces, coal fines, solidified tar, yellow brick, black, dry, no odor	SO 24	2.0' to 3.0'	0.0	
4.0		4.5	ML - silt, some sand, moist, gray, Native			0.0	
	2.0		water enters test pit from south side				
	4.5		Test pit ends in native soils				

Tonawanda Coke Corporation
Site 108
Tank Area Tar Thickness
September 1 and 8, 2016

Tank	Location relative to tank	Distance from tank (Ft.)	Surface	Tar Depths (inches)			Soil encountered?		Water present?	Bottom Encountered
				Soft	Hard Granular	Hard	Yes/No	Tar impacted?		
West	NW	12	Vegetation (2")			X	No			Hard tar
West	NW	6	Tar	3	7		No			Hard granular tar
West	NE	6	Tar	4	6		No		Yes	Wood
West	E	6	Tar	16			No			Soft Tar
West	SE	4	Tar	12	X		No			Hard granular tar
West	S	3	Tar	16			No			Soft tar
West	SW	20	Tar	10	X		No			Hard granular tar
West	W	4	Tar	8			Yes	at least 4"		Soil
Center	N	5	Tar	12	X		No		Yes	Hard tar
Center	E	5	Sediment/moss (4")		16		No			Hard granular tar
Center	S	6	Tar	9	X		No			Hard granular tar
Center	W	6	Tar	16			No			Soft Tar
East	N	5	Moss (1")	2	6 (under 2-3" soil)		Yes (at 12")	No	Yes	Soil - gray silty clay
East	E	5	Moss (2")	18			Yes	Yes	Yes	Soil - gray silty clay
East	S	3	Moss (1")	8	X		No			Hard granular tar
East	SW	8	Soil				Yes	To 10"-11"		Soil
East	W	6	Moss (1") then soil				Yes	Tar in soil at 6-8"		Plywood at 10" then soil

Note - East tank is in separate diked area

X under tar depths columns indicates tar is present, but thickness not determined

Tonawanda Coke Corporation
Site 108
Aboveground Storage Tank Assessment
September 1, 2016

Location	Construction	Diameter (ft.)	Height (ft.)	Condition				Contents	
				Top	Walls	Stairway	Piping	Water	Solids
East Tank	Welded steel on cement base	45	36	Intact	Corroded some holes and pinholes through tank wall	Steps intact. Railing intact.	Open valve on manway on NE side of tank appears to limit liquid height in tank. Piping support separating from tank on N side. Tank wall torn and buckling inward at pipe support.	trace	2 feet of sticky tar
Center Tank	Welded steel on cement base	45	36	large hole (12 ft by 12 ft) in top, steel buckled inward	Lower 2 feet severely corroded. Small holes and pinholes through tank wall. Hole in wall of tank on north side appears to limit liquid height in tank	First 4 steps missing - rusted away. Remainder ok. Railing intact.	Tar leaks from open valve on manway on NE side of tank. West and center tanks appear manifolded together by 24 inch diameter piping	2 feet above tar	9 feet of sticky tar
West Tank	Welded steel on cement base	45	9	Corroded/collapsed. Resting on tar at approximately 4.5 feet above ground	Tank is collapsed to 9 feet above ground. Large hole corroded in south side of tank allows tar and liquids to leak from tank	None - steps appear to have been cut off	No overhead piping attached. Ground level piping corroded. West and center tanks appear manifolded together by 24 inch diameter piping	none	4.5 feet of tar/sludge. Some tar is flowable, some is hardened.

Location	Construction	Diameter (In.)	Condition				Contents	
			Pipe	Supports	Insulation	Fittings	Water	Solids
Conveyance piping	Steel	Varies	Appears intact. One pipe appears to go underground NW of center tank. Ground level piping severely corroded. Overhead piping better condition.	Center tank pipe support separating from tank +/- 10 feet above ground. Otherwise, generally intact	Peeling from pipes where still in place. Suspected ACM	Generally intact. Piping NW of center tank has valves which are embedded 12 inches into tar.	Unknown	Unknown

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