FOCUSED REMEDIAL INVESTIGATION PHASE II WORK PLAN FOR TONAWANDA COKE SITE 108

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TONAWANDA, NEW YORK

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LIST OF ACRONYMS

ACRONYM	Definition
bml	below mud line
CAMP	Community Air Monitoring Plan
CLP	Contract Laboratory Program
DO	dissolved oxygen
DOT	Department of Transportation
FSP	Field Sampling Plan
ft bgs	feet below ground surface
FWRIA	Fish and Wildlife Resource Impact Analysis
GPS	Global Positioning System
HASP	Health and Safety Plan
HDPE	high-density polyethylene
IDW	Investigation Derived Waste
IRM	Interim Remedial Measure
NAPL	non-aqueous phase liquid
NTU	nephelometric turbidity unity
NYSDEC	New York State Department of Environmental Conservation
ORP	oxidation reduction potential
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PFAS	Per- and Polyfluoroalkyl Substances
PID	photoionization detector
PPE	personal protective equipment
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objectives
SGV	Sediment Guidance Value
SOP	Standard Operating Procedures
SPDES	State Pollution Discharge Elimination
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCC	Tonawanda Coke Corporation
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
USCS	United States Classification System
VOC	volatile organic compound

1.0 INTRODUCTION

On behalf of Honeywell, Parsons has prepared this Focused Remedial Investigation Phase II Work Plan (Work Plan) to complete additional site investigation activities to address data gaps and supplement the Remedial Investigation (RI) for Operable Unit 3 (OU-3) of the Tonawanda Coke Site, also known as Site 108. Site 108 is a portion of the former Tonawanda Coke Corporation (TCC) facility located at 3800 River Road in Tonawanda, Erie County, New York (**Figure 1**).

Focused RI activities for Site 108 were primarily carried out in 2020 and 2021 to supplement historical investigation results and to determine the nature and extent of the remaining impacts on Site 108 following previous remedial activities. The previous Focused RI activities included:

- Surface and Subsurface Soil Investigation
- Groundwater Investigation
- Drainage Ditch Investigation
- Wetland Sediment Investigation
- Niagara River Sediment and Shoreline Investigation, Bathymetric Survey, Visual Assessment
- Fish and Wildlife Resource Impact Analysis (FWRIA)
- Breeze Stockpile Sampling
- Investigation-derived Waste (IDW) Management
- Community Air Monitoring Plan (CAMP) Implementation
- Data Management and Validation
- Wetland assessment/delineation
- Surveying of test pits, monitoring wells, staff gauges, and wetland boundaries

Focused RI activities were performed in accordance with the Remedial Investigation Work Plan (RIWP) and associated attachments, submitted to and approved by the New York State Department of Environmental Conservation (NYSDEC) (Parsons 2020). Results from these investigation activities are provided in the Draft RI Report (Parsons 2022) provided to NYSDEC in January of 2022. This Work Plan addresses data gaps identified in the Draft RI Report.

2.0 SUMMARY OF FINDINGS FROM FOCUSED RI

A summary of the nature and extent of impacts, conceptual site model, and data gaps based on the detailed results included in the Draft RI Report is provided below.

2.1 Nature and Extent of Impacts

Historical sample results and analytical data compiled as part of the Focused RI were compared to standards, criteria, and guidance values (SCGs) for soil, groundwater, surface water, and sediment to assess impacts and to develop an understanding of the nature and distribution of environmental impacts associated with the prior TCC activities on the Site.

2.1.1 Surface and Subsurface Fill/Soil

Soil sample analytical results were compared to commercial use soil SCGs, which is consistent with anticipated future site use. Fill material at Site 108 is primarily historically-placed soils but also includes other materials such as coal, breeze, and ash. For convenience, references to soil and comparisons to Soil Cleanup Objectives (SCOs) include fill soils, underlying native soils, and surface and subsurface materials that are non-soil fill, such as coal, breeze, and ash, as well as mixtures of these materials and soil. Surface and subsurface soil exceedances of one or more SCGs are widespread throughout Site 108. The primary constituents exceeding SCGs are SVOCs and various metals. Exceedances of SCGs occur primarily within fill from the surface to as deep as 15 feet below ground surface (ft bgs). Isolated areas of subsurface tar were also identified; however, a significant volume of subsurface tar was excavated during prior interim remedial measures (IRMs (Parsons 2019)).

2.1.2 Groundwater

Groundwater samples exceeded one or more SCGs in all but one well sample. The primary constituents exceeding SCGs were VOCs, SVOCs, metals and cyanide. The specific compounds exceeding SCGs and the concentrations of the detected compounds varied significantly between well samples. The data suggests there are isolated areas of groundwater impact but not a site-wide plume.

Groundwater sample exceedances of metals SCGs are primarily a result of naturally occurring conditions rather than site impacts.

Groundwater gradients are predominately west toward the Niagara River although the impact of low permeability barriers along the river are apparent. A thick, low-permeability clay layer is present beneath the fill in the eastern portion of Site 108 that prevents significant downward migration of groundwater. This clay layer is absent in the western portion of Site 108.

The former Rattlesnake Creek channel and former Erie Canal run north to south across Site 108. Site data indicates that the fill in these former channels is not serving as preferential groundwater flow paths.

2.1.3 Drainage Ditch Soil and Sediment

Soils and sediments within the man-made drainage ditch and connected low-lying areas exceeded SCGs at all locations to varying depths, up to a maximum of 5 ft bgs, which was the maximum depth sampled. SCGs were exceeded for various metals and polycyclic aromatic hydrocarbons (PAHs).

2.1.4 Niagara River Sediment

Samples of sediments within the study area of the Niagara River adjacent to Site 108 exceeded SCGs for PAHs and metals at multiple sample locations and depths. The occurrence of sediments with concentrations above SCGs occurred in two relatively quiescent areas termed the south and north embayments. Between the embayments, there was no fine sediment suitable for sampling.

The character of the sediment in the north and south embayment's were different as the south embayment exhibited relatively shallow impacts while the north embayment exhibited deeper impacts. Exceedances of Sediment Guidance Value (SGVs) for metals were almost always co-located with PAH exceedances. PAHs and metals exceeded SGVs to varying depths in the southern embayment area and consistently exceeded SGVs to five foot depth, which was the deepest interval sampled, along the shoreline in the northern embayment.

There was no tar or sheening noted in any of the Niagara River sediment samples.

2.2 Conceptual Site Model

Results of the previous investigations and the 2020/2021 Focused RI indicate that exceedances of SCGs are primarily a result of historical site operations and permitted material disposal practices. A layer of fill is present across the majority of Site 108. The fill typically consists of sand, silt and/or clay and includes a variety of other materials co-placed with the earthen materials, including coal, coke, cinders, ash, brick (yellow and/or red), slag, concrete, metal, wood, and plastic debris. Constituents within this fill contribute to localized impacts to groundwater. It also may serve as a potential source of impacts to sediments within the Niagara River through migration of impacted groundwater and transport of surface soils during storm events.

Localized areas of Site 108 also contain subsurface tar in various forms. A significant volume subsurface tar was removed during prior IRMs. Therefore, the potential impacts to groundwater from subsurface tar have been significantly reduced.

Potential sources of historic and/or ongoing impacts to adjacent Niagara River sediment include:

- Transport of impacted sediment from upstream areas of the Niagara River
- Historic and ongoing drainage ditch discharges
- Transport of surface soils from Site 108 directly to the Niagara River during storm events
- Discharge of impacted groundwater to the Niagara River
- Losses during past shoreline loading and unloading of materials such as tar and coal
- The storm drain discharging to the river on the northwestern corner of Site 108

2.3 Remaining Data Gaps

While Site 108 environmental conditions were investigated during the 2020/2021 Focused RI, additional data gaps pertaining to the nature and extent of impacts associated with Site 108 remain. The supplemental investigation activities specified in this Work Plan are intended to address outstanding data needs as identified in the Draft RI Report (Parsons 2022) and summarized below:

- Further characterize the extent of subsurface tar
- Characterize the storm drain discharging to the Niagara River near the northwest corner of Site 108
- Further characterize the nature and extent of groundwater impacts adjacent to the Niagara River,
- Evaluate hydraulic conductivity of the various geological units and connectivity between them
- Provide a second round of comprehensive groundwater analytical results, including evaluation of dissolved and total constituent concentrations and collection of indicators of natural biodegradation
- Evaluate potential surface water impacts to the Niagara River
- Further characterize impacts to sediment within the wetland
- Further characterize the extent and significance of impacted sediment within the Niagara River

The proposed detailed scope of work to address these data gaps is provided in Section 3.

3.0 PHASE II INVESTIGATION SCOPE OF WORK

The scope of work for supplemental investigation activities to address outstanding data gaps will include:

- Additional test pits to further delineate the extent of subsurface tar (**Section 3.1 Supplemental Subsurface Tar Investigation**)
- Installation and sampling of new monitoring wells, sampling and gauging of existing monitoring wells, and hydrologic testing of new and existing monitoring wells to further characterize groundwater impacts and evaluate hydraulic conductivity. Additionally, two new staff gauges will be installed along the Niagara River shoreline, and both new and existing staff gauges will be gauged to evaluate the interaction between surface water and groundwater. (**Section 3.2 Supplemental Groundwater Investigation**)
- Collection of additional sediment and surface water samples from locations within the Niagara River to further characterize the extent of impacts (**Section 3.3 Supplemental Niagara River Sediment and Surface Water Investigation**)
- Collection of sediment samples from two locations to further characterize impacts to the onsite wetland (**Section 3.4 Supplemental Wetland Investigation**)
- Sampling of sediments within the storm drain discharging to the Niagara River near the north-east corner of the site to evaluate whether it is serving as an ongoing source of impacts to the Niagara River. (**Section 3.5 Storm Drain Investigation**)

Field activities and sampling will be conducted in accordance with NYSDEC's "DER-10 - Technical Guidance for Site Investigation and Remediation" (NYSDEC 2010) and the previously approved project investigation supporting plans included in the Focused RI Work Plan (Parsons 2020) including the project Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and CAMP.

3.1 Supplemental Subsurface Tar Investigation

Limited amounts of subsurface tar exist in localized areas of Site 108. This residual tar remains following multiple historical removal events, as detailed in the Draft RI Report and summarized below. Removal areas associated with these activities are shown in **Figure 2** and summarized below.

Tar removal was performed at Site 108 from June 2017 to October 2018 by TCC in connection with the Tar Removal and Tank Demolition Phased Interim Remedial Measure Pilot Project Work Plan (GHD 2017). IRM tar removal activities involved excavation of six areas identified as containing coal tar. The tar removal activities are summarized in *Site 108 Remediation Activities Summary Report* (Neu-Velle 2019), which is included as Appendix A to the RIWP. Areas where the 2019 summary report identified remaining tar following completion of the IRM are shown on **Figure 2**.

Additional tar removal was completed by Parsons on behalf of Honeywell during the 2019 – 2020 tank removal in accordance with a U.S. Environmental Protection-(USEPA)-approved Work Plan. From September 2019 to February 2020, three 60+ year-old aboveground product storage tanks, tank contents (tar and water) and associated piping were removed from Site 108 by Parsons and OSC on behalf of Honeywell. The IRM included excavation and disposal at a permitted facility of tar-impacted soils beneath and adjacent to the tanks. Excavations typically were advanced horizontally and vertically to an underlying silty loam layer or until tar-impacted soils were no longer evident. One area under the concrete pad supporting Tank 3 was extended to a depth of five to six feet to the top of the silty loam layer. Residual tar was observed in crevices within the silty loam layer. The excavation was further extended into the silty loam layer to evaluate the vertical extent of the tar "veins." The tar veins continued beyond the excavation depth. Several test pits within the excavation were installed to assess the horizontal extent. No tar was encountered within the silty loam layer in the three test pits. Minor amounts of tar continued to be encountered within the south sidewall of the Tank 3 berm beyond the excavation area (Parsons 2021).

During the 2020/2021 Focused RI, test pits were installed to characterize the extent of subsurface tar remaining following previous removal events. The results of Focused RI test pitting are shown on **Figure 2**. Remaining tar identified during the Focused RI was observed to extend to a maximum depth of approximately nine ft bgs.

3.1.1 Test Pit Installation

To address subsurface tar data gaps, twelve test pits will be installed at Site 108, as shown on **Figure 2** and in **Table 1**. Test pit TP-45-22 is located in an area where topography prevented installation of a soil boring during the Focused RI in 2020. The feasibility and approach for characterization of subsurface conditions in this area will be determined in the field in consultation with NYSDEC.

Volatile organic compound (VOC) analysis was only completed on a subset of soil samples during the Focused RI in 2020. This testing did not include any tar-impacted soils in the area between the former tanks and the drainage ditch. As detailed Section 3.1.2, all Phase II soil samples will be analyzed for VOCs. If the additional proposed test pits in the area between the former tanks and the drainage ditch do not encounter tar, additional test pits will be installed at prior test pit locations TP-22-2020W2 and TP-22-2020C where tar was encountered during the Focused RI test pitting, and soil samples will be collected to facilitate evaluation of potential VOC impacts.

The presence and character of any tar present within test pit soils will be identified and described consistent with the categories of tar presented in Section 4.2.2 of the Draft RI Report (Parsons 2022), and summarized below:

- Tar saturated
- Coated material
- Pliable tar and pliable tar/fill mixture
- Hardened tar and hardened tar/fill mixture

A utility location survey and mark-out will be performed for each proposed test pit location prior to commencement of intrusive activities.

Test pits will be excavated to the top of the native soil layer, which is anticipated to be between four and 10 ft bgs. Test pits may be excavated deeper if tar, or other indications of impacts, are observed at the interface between fill and native soil. If impacts are observed near the bottom of fill or the top of native material, test pitting will continue until such impacts are no longer observed.

As the test pits are installed, excavated soil and fill materials will be visually assessed, photographed, screened with a photoionization detector (PID). Relevant field observations will be documented in a field logbook, or equivalent record.

Upon identifying the native soil layer, recording field observations, and collecting requisite soil samples as described in Section 3.1.2., the test pit will be backfilled. Test pit backfilling will consist of replacing excavated materials in the reverse order from which they were removed. The field crew and geologist will take care to avoid leaving subsurface fill materials on the ground surface. The test pit locations and corresponding ground surface elevations will be surveyed and included with the site geographic database.

The test pit locations on **Figure 2** are general areas where test pits will be excavated. The actual test pit locations and extents will be determined in the field in consultation with NYSDEC. If necessary, additional test pits may be excavated in an area to identify the extent of remaining tar, adequately characterize subsurface materials, or both.

Test pit installation methods will be consistent with the procedures specified in the FSP (Section 2.2 Soil Borings and Test Pits) (Parsons 2020).

3.1.2 Test Pit Soil Sampling

Prior RI results indicate that surface soils in the area of the proposed test pits consistently exceed commercial SGCs, therefore additional characterization of surface soils is not required. Soil samples will be collected and submitted for laboratory analysis from each test pit in the one-foot interval beneath tar, if present. In the event that tar is not observed within a test pit, a sample will be collected from a depth interval where the soil exhibits staining, odor, or elevated PID readings. A sample will be collected from the middle depth of the fill material If neither tar nor other indications of impacts are observed. If excavation depth does not allow for collection of the deeper sample, the soil sample may be collected from a location adjacent to the test pit via drilling rig.

Laboratory analysis to be completed on soil samples are shown in **Table 1** and will consist of Target Compound List (TCL) VOCs, TCL semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and cyanide.

Based on the results from the 2020/2021 Focused RI, there were no exceedances of Commercial Soil SCGs for pesticides, polychlorinated biphenyls (PCBs) or Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) compounds in soil samples from Site 108. There was one groundwater sample that slightly exceeded groundwater criteria for PFAS and two groundwater samples that exceeded groundwater criteria for pesticides. These results indicate pesticides, PCBs and PFAS compounds are not a significant concern at Site 108, therefore, soil samples will not be analyzed for these parameters.

Soil sampling will be performed in accordance with the procedures outlined in the relevant sections of the FSP (Section 2.2 Soil Borings and Test Pits and Section 2.8 Surface Soil Sampling).

3.2 Supplemental Groundwater Investigation

As a part of the Focused RI, eight groundwater monitoring wells and two piezometers were installed in November and December 2020 at Site 108 to assess groundwater quality and flow direction. The eight new monitoring wells and two existing monitoring wells were sampled for chemical analysis. An additional groundwater monitoring well was installed within the area of the former Erie Canal in August of 2021, however this well was not sampled because it was screened within the underlying clay unit rather than within the fill unit, which was not present at this location. Complete validated groundwater analytical results from the Focused RI are included in Draft RI Report (Parsons 2022).

Analytical results from multiple groundwater samples, particularly MW-11S-2020, MW-11D-2020, MW-10S-2020 and MW-10D-2020, exhibited concentrations above SCGs for various VOCs and SVOCs. Additional groundwater investigation activities to be completed to refine understanding of the nature and extent of groundwater impacts include:

- Installation of four additional monitoring well clusters
- Sampling and analysis of the new monitoring wells
- Resampling and analysis of the eight Focused RI and two historical monitoring wells that were sampled during the Focused RI
- Sampling of the two piezometers installed during the Focused RI within the former Rattlesnake Creek channel. These piezometers were installed and constructed consistent with the installed monitoring wells.

- Collection of indicators of natural biodegradation
- Completion of hydraulic conductivity testing
- Collection of two rounds of groundwater level and surface water elevation measurements

These activities are detailed below.

3.2.1 Monitoring Well Installation

New groundwater monitoring well clusters will be installed at four locations, as shown on **Figure 3** and in **Table 1**, to supplement groundwater analytical results collected during the Focused RI. Wells will be installed in shallow and deep pairs, denoted on **Figure 3** with an “S” for shallow wells and a “D” for deep wells. One well from each pair will be screened in fill and the other will be screened in the sand and gravel unit immediately overlying bedrock. This will allow for characterization of groundwater within the upper and lower portions of the water-bearing zone.

New monitoring well locations will be surveyed by a private utility locating company prior to installation. Utilities in the vicinity of each proposed monitoring well location will be marked out, and locations in conflict with marked out utilities will be relocated prior to commencement of intrusive activities.

Borings associated with proposed monitoring wells will be installed via hollow stem augers, and soils will be continuously recovered via split spoon sampler. Recovered soil and fill materials will be visually assessed, photographed, screened with a PID, and documented in a field log.

The screened interval of the shallow well will be installed within fill or alluvial sand such that the well screen straddles the water table, which is estimated to be present within four feet of the ground surface. If a clay layer is encountered, well screens will be installed on top of the clay layer, within the fill.

The screened interval of the deeper well will be installed at the base of the water-bearing zone, entirely within the sand and/or gravel, which is estimated to be at approximately 40 ft bgs.

The wells will be constructed using 2-inch diameter Schedule 40 (Sch. 40) polyvinyl chloride (PVC) riser threaded with 2-inch diameter Sch. 40 PVC 0.010-slot screen. Well screen length with be determined in the field based on observed thickness of the saturated zone. A 5-foot or 10-foot long well screens will be selected in the field to maximize coverage within the saturated zone, while also isolating the top of the saturated zone in shallow wells, and the bottom of the saturated zone in deep wells. Final well design will be based on the site conditions, including the depth to the water table and thickness of fill.

Monitoring wells will be installed consistent with the procedures specified in Section 2.3 Monitoring Well Installation and Construction of the FSP. Each new monitoring well will be surveyed to determine the horizontal location and vertical elevations.

3.2.2 Monitoring Well Soil Samples

Prior RI results indicate that surface soils in the area of the proposed monitoring wells consistently exceed commercial SGCs, therefore additional characterization of surface soils is not required. Soil samples will be collected and submitted for laboratory analysis from each monitoring well location in the one-foot interval beneath tar, if present. In the event that tar is not observed with the monitoring well soil boring, a sample will be collected from a depth interval where the soil exhibits staining, odor, or elevated PID readings. If neither tar nor other indications of impacts are observed, a soil sample will be collected from the middle of the depth interval where the monitoring well is to be screened.

The selected soil samples will be submitted to a laboratory and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and cyanide, as shown in **Table 1**.

3.2.3 Monitoring Well Development

Each new monitoring well will be developed to remove drilling fluid used during boring advancement, as well as any fine-grained material that may have settled in and around the well screen during well construction. Well development will be performed a minimum of 24 hours after grout has been installed to provide sufficient time for the grout to cure.

Well development activities will consist of purging water until water quality parameters have stabilized for three successive measurements and purge water turbidity drops below 50 nephelometric turbidity units (NTUs). If parameters do not stabilize or turbidity remains above 50 NTUs, the well will be considered developed once a minimum of three well volumes or a maximum of 10 well volumes have been removed.

Well development may be performed using a stainless steel or PVC bailer or a water pump paired with high-density polyethylene (HDPE) tubing and surge block. If the well goes dry during development, bailing or pumping will pause until 80 percent of the initial water level has recharged, at which point pumping or bailing will resume. The well will be considered developed once this process has been repeated, and the well has been pumped dry three times.

3.2.4 Monitoring Well Groundwater Sampling

Groundwater samples will be collected from each of the new monitoring wells, as well as from existing monitoring wells, as shown on **Figure 3** and listed in **Table 1**. The two piezometers installed during the Focused RI within the former Rattlesnake Creek channel will also be sampled. These piezometers were installed and constructed consistent with the installed monitoring wells.

Groundwater samples will be collected using low-flow sampling techniques. Prior to sampling, the water level in each well will be measured and recorded to the nearest 0.01-foot. Well sampling will commence once water quality parameters are stable for three consecutive readings. The stabilization guidelines are as follows:

Temperature	± 10% of measurement
pH	± 0.1 pH units
Specific conductance	± 3% of measurement
Redox	± 10 mV
Dissolved oxygen	± 10% of measurement
Turbidity	± 10% of measurement, or under 10 NTUs

Dedicated and disposable groundwater sampling equipment (e.g., tubing) will be used for sample collection to the extent practical. Any non-dedicated or non-disposable equipment (e.g., water level meter) will be decontaminated between samples.

Groundwater samples will be submitted to a NYSDEC approved Contract Laboratory Program (CLP) laboratory and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and cyanide, as shown in **Table 1**. Additionally, groundwater samples from each well will be field filtered and analyzed for dissolved metals and SVOCs to determine if suspended solids may be contributing to concentrations observed in data from the initial round of groundwater samples.

Samples from shallow wells will also be analyzed for a suite of biodegradation parameters, including: total nitrogen, nitrate, ferrous iron, total iron, dissolved iron, manganese, sulfate, sulfide, methane, total organic carbon, chloride, and alkalinity. Field readings of pH, oxidation reduction potential (ORP), and dissolved oxygen (DO) will also be collected using properly calibrated field instrumentation to support evaluation of natural biodegradation. These field readings will be collected using a flow through cell to avoid equilibration with atmospheric conditions.

Groundwater sampling will be performed in accordance with the procedures specified in Section 2.6 Groundwater Monitoring and Sampling of the FSP.

3.2.5 Hydrologic Testing

Following groundwater sampling, new and existing monitoring wells will be tested to evaluate site-specific hydraulic conductivity of the various geologic units present at Site 108. Hydraulic conductivity will be evaluated using either rising head or falling head test procedures. A standard operating procedure (SOP) for hydraulic conductivity testing is included as **Attachment 1**, and an example field log is included as **Attachment 2.**

3.2.6 Staff Gauge Installation and Surface Water Elevation Measurements

Staff gauges were installed during the Focused RI in surface water bodies to allow collection of surface water elevations and facilitate evaluation of the relationship between surface water and groundwater. Three gauges were installed in the drainage ditch, one was installed in each of the two ponded areas adjacent to the drainage ditch, and two were installed in the Niagara River. Staff gauges were mechanically driven into stream/river bottoms by hand methods and surveyed for elevation at the base of the staff gauge, where the gauge meets the mudline. The existing staff gauges within the drainage ditch and ponded areas will be used to measure surface water elevation concurrently with groundwater elevation measurements.

The staff gauges installed in the Niagara River were lost shortly after installation, likely due to ice. Two replacement staff gauges will be installed on the mooring dolphins or on rigid shoreline infrastructure instead of driven into the river bottom, which will prevent staff gauge destruction due to weather conditions. Alternatively, benchmark elevation lines may be established on rigid shoreline infrastructure to allow water levels below the benchmarks to be measured. The most appropriate approach will be determined in the field based on site conditions. The new staff gauges/benchmarks will be used to measure the water elevation of the Niagara River concurrently with groundwater elevation measurements and surface water elevation measurements from other on-site staff gauges.

3.3 Supplemental Niagara River Sediment and Surface Water Investigation

During the 2020/2021 Focused RI, sediment samples were collected from 21 locations within the Niagara River adjacent to Site 108. Generally, the occurrence of sediment concentrations exceeding SCGs was limited to two relatively quiescent areas, referred to as the south and north embayments. Sediments exceeding SCGs were found to be shallow in the south embayment, and as deep as five feet below mud line (bml) - the maximum depth sampled - in the north embayment. Planned sampling locations along the very steep portion of the river bottom adjacent to the central area of Site 108 were met with refusal despite repeated attempts, indicating an absence of softer potentially impacted depositional sediment in this area.

Additional sediment coring and sampling is proposed to further characterize both the lateral and vertical extent of sediment impacts, as described in the following sections.

3.3.1 Sediment Coring

Vertically continuous sediment cores will be collected from nine locations within or proximate to the northern embayment area (**Figure 4**) and from five locations within or proximate to the southern embayment (**Figure 5**) as described in **Table 1**.

Sediment cores will be collected using a pontoon boat-mounted vibracore and Lexan core barrel to a depth of 10 feet bml, or until equipment refusal. The sampling vessel will be held stationary over the core target by vertical poles (spuds), anchors, or a combination thereof, which will be lowered to the river bottom.

Upon retrieval, each sediment core will be logged and classified in the field using the Unified Soil Classification System (USCS), documented in its entirety via photographs, and screened with a PID. Additional field tests (e.g., pocket penetrometer) may be conducted while logging and classifying the sediment cores. Sediment samples will be collected, as described in **Section 3.3.2 Sediment Sampling**, below.

3.3.2 Niagara River Sediment Sampling

Sediment samples will be collected from proposed sediment sampling locations in six-inch intervals from zero to one feet bml and in 12-inch intervals from one to 10 feet bml, or until native material is encountered, whichever comes first. If native material is encountered, a sample will be collected from the top one foot of native material.

Sediment samples will be collected from the intervals prescribed above and analyzed for TCL SVOCs (including the 34 PAHs specified in NYSDEC 2014), TAL metals, and total organic carbon (TOC), as shown in **Table 1**. A subset of sediment samples representative of the range of sediment conditions observed in the field will be submitted for grain-size testing via hydrometer (ASTM D7928) and/or sieve analysis (ASTM D6913). Sample locations will be surveyed during collection using GPS.

Sediment sampling will be performed in accordance with the procedures specified in Section 2.9 Sediment Sampling of FSP.

3.3.3 Niagara River Surface Water Sampling

Surface water samples will be collected from five locations along the Niagara River, adjacent to Site 108, to evaluate the potential for surface water impacts to the Niagara River. Proposed surface water sampling locations are shown on **Figure 4** and **Figure 5** and in **Table 1** for the northern shoreline area and southern embayment areas, respectively.

Surface water samples will be submitted to a laboratory and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and cyanide, as shown in **Table 1**.

These samples will be collected from Niagara River at mid-water depth in accordance with the procedures specified in Section 2.11 Surface Water Sampling of the FSP.

3.4 Supplemental Wetland Investigation

Sediment and underlying soil samples were collected from one location within the onsite wetland (SD-10-2020-1) during the 2020/2021 Focused RI. Analytical results from SD-10-2020-1 exceeded sediment SGVs for total PAHs and metals.

Supplemental sediment and underlying soil sampling will be completed at two locations within the wetland, as shown on **Figure 6** and in **Table 1**. Samples will be collected using a slide hammer and MacroCore Lexan liner to a maximum of 5 ft bgs or until native material is encountered. Samples will be collected to a minimum of 2 ft bgs at locations where overlying fill is less than 5 ft thick, regardless of whether the soil is native material or fill. Sampling methods, locations, and total depths are subject to change based on an inspection of the current conditions at sampling locations.

Upon retrieval, each sediment core will be logged and classified in the field using the USCS, documented in its entirety via photographs, and screened with a PID. Additional field tests (e.g., pocket penetrometer) may be conducted while logging and classifying the sediment cores.

Samples will be collected in six-inch intervals up to 1 ft bgs, and in 1-foot intervals from one to 5 ft bgs, or until native material is encountered, whichever comes first. If native material is encountered within the top 2 ft, samples will be collected from the top two foot.

Samples will be analyzed for TCL VOCs, SVOCs (including the 34 PAHs specified in NYSDEC 2014), TAL metals, cyanide, and TOC as shown in **Table 1**. After sampling, the location of each sample location will be surveyed with portable global positioning system (GPS) equipment.

Sediment sampling will be performed in accordance with the procedures specified in **Section 2.9 Sediment Sampling** of the FSP.

3.5 Storm Drain Investigation

A storm drain runs along the northern edge of Site 108 just south of the fence line and discharges into the Niagara River near the northwest corner of Site 108, as shown on **Figure 4**. This storm drain originates on the Tonawanda Plastics Site based on historical utility drawings. It also receives roof drainage from the Niagara River World building to the north (4000 River Road) as well as local surface water from Site 108.

Investigation activities will be completed to facilitate evaluation of whether the storm drain is an ongoing source of contamination to the Niagara River. Investigation activities will include a video inspection of the storm drain to evaluate potential locations of leaks, as well as the location of sewer connections or other features. The results of the video inspection may be used to reevaluate the location of the sediment samples proposed below. The video inspection will cover the length of the drain from the discharge at the Niagara River to River Road.

Sediment samples will be collected from within the storm drain where it discharges to the Niagara River and from the location of the onsite inlet grill located on Site 108 north of the conveyer structure, as shown on **Figure 4** and in **Table 1**. The proposed location of sediment samples associated with the storm drain will be re-evaluated following completion of the video inspection. If sediment is present, sediment samples will be collected in continuous 6-inch intervals to refusal, presumably on the bottom of the storm drain. It is not anticipated that more than 6 inches of sediment will be present, but sediments will be probed at each sampling location to estimate the thickness of sediments within the storm drain. Samples will be analyzed for TCL SVOCs (including the 34 PAHs specified in NYSDEC 2014), TAL metals, and TOC, as shown in **Table 1.**

4.0 INVESTIGATION DERIVED WASTE MANAGEMENT PLAN

The following Investigation Derived Waste (IDW) management procedures will be followed during the supplemental investigation.

4.1 Soils

Soils excavated from test pits that do not exhibit any gross contamination will be placed back into the cavity after completion of the test pit. Fill will be segregated from clay excavated from a test pit and the clay will be replaced in the bottom of the cavity. Gross contamination is defined for these purposes as soils exhibiting the presence of mobile tar and/or free oils.

Soils from test pits that exhibit gross contamination will be stockpiled in an IDW Storage Area that will be established at the start of field work. The location of the storage area will be established based on discussions with NYSDEC prior to generating IDW. Grossly contaminated soils will be stockpiled and staged on plastic sheeting (10 mil minimum) and covered with a 12-mil (minimum) UV-resistant plastic sheeting, secured with sandbags around the perimeter. Alternatively, grossly contaminated soils may be containerized in a double-lined (10 mil minimum) roll-off container. Stockpile volumes on plastic sheeting shall not exceed 100 cubic yards. Stockpiles may be used to segregate clearly grossly contaminated material of different characteristics. One waste characterization sample will be collected for every 100 cubic yards of stockpiled material. Waste characterization sample analysis shall include the full suite of toxicity characteristics:

- Toxicity Characteristic Leaching Procedure (TCLP), VOCs, SVOCs, and Metals
- PCBs
- Flash Point and Paint Filter Test
- pH
- Reactivity, Cyanide
- Reactivity, Sulfide

A record of which test pit soil is in each stockpile, where they are stockpiled, and which waste characterization results represent that material will be kept in the field notebook.

Soils from borings conducted for monitoring well installations will be stockpiled, staged, and sampled as described above. Soil that is characterized as non-hazardous based on analytical results and that is free of signs of gross contamination, waste, non-aqueous phase liquid (NAPL), etc. shall be evenly spread and graded on non-paved areas of the Site near the source boring, provided that prior approval has been received from NYSDEC. Alternatively, these non-hazardous soils may be containerized in Department of Transportation (DOT)-compliant 55-gallon open-topped steel drums or containerized in a double-lined (10-mil minimum) roll-off container, stored in the IDW Storage Location, and disposed of in accordance with 6 NYCRR Parts 360, 364 and the 370 series.

Soil that is characterized as hazardous and/or contains signs of gross contamination, NAPL, etc. will be containerized in DOT-compliant 55-gallon open-topped steel drums or containerized in a double-lined (10-mil minimum) roll-off container, stored in the IDW Storage Location, and disposed of in accordance with 6 NYCRR Parts 360, 364 and the 370 series.

4.2 Water

Monitoring well purge water and equipment decontamination water will be containerized in DOT-complaint 55-gallon open-topped steel drums. A waste characterization sample will be collected and analyzed for the full suite of disposal characteristics:

- TCL VOCs
- TCL SVOCs
- TCL Pesticides
- TCL Herbicides
- TAL Metals plus Mercury
- Total Cyanide
- Total PCBs
- pH
- Flashpoint
- Reactivity, Cyanide
- Reactivity, Sulfide

4.3 Personal Protective and Disposable Sampling Equipment

Personal Protective Equipment (PPE), disposable sampling equipment (ex., bailers and rope), and general trash that may come in contact with potentially impact soils/water generated during completion of the RI will be containerized in DOT-compliant 55-gallon open top steel drums and stored in the IDW Storage Area. These materials will be secured and labeled as non-hazardous waste and disposed of accordingly.

PPE and disposable sampling equipment that comes in contact with grossly contaminated material (containing mobile tar and/or free oils) will be containerized separately. The disposal requirements for these wastes will be determined based on the results of waste characterization sampling of the corresponding grossly contaminated material.

5.0 REPORTING AND SCHEDULE

The results from the Focused RI Phase II will be integrated into the Draft RI Report submitted to NYSDEC in January of 2022. In addition to the Phase II data and observations, responses to the NYSDEC and NYSDOH comments will be addressed in the revised report. A draft schedule for completion of the Focused RI Phase II and submitting the Revised RI Report is provided below. Proposed durations for investigation activities and report preparation are presented. The start date of these activities is dependent upon approval of this work plan by NYSDEC.

Activity	Proposed Schedule
Field Investigation	Mobilization within 90 days of Work Plan approval and duration of approximately 60 days
Data Analysis and Validation	Within 60 days after completion of all field investigation activities
Revised Draft RI Report	Within 90 days after completion of data validation

6.0 REFERENCES

GHD. 2017. *Confirmation Investigation Report*. March.

Neu-Ville. 2019. *Site 108 Remediation Activities Summary Report*. March.

NYSDEC. 2010. *DER-10/Technical Guidance for Site Investigation and Remediation*. May 3.

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Parsons. 2021. *Tank Removal Action Summary Report*. Tonawanda Coke Corporation, Site 108. February 2021.

Parsons. 2022. *Draft Remedial Investigation Report*. Operable Unit 3 (Site 108), Tonawanda Coke Site. 3800 River Road, Tonawanda, NY. January 2022.

TABLES

TABLE 1
SAMPLING PLAN FOR REMEDIAL INVESTIGATION PHASE II AT TONAWANDA COKE SITE 108

Sample ID	Sample Medium	Depth[1]	TCL VOCs	TCL SVOCs (total)[2,4]	TCL SVOCs (dissolved)[3]	TAL Metals (total)[2]	TAL Metals (dissolved)[3]	Cyanide (total)[2]	Cyanide (dissolved)[3]	TOC	Biodegradation Indicators[5]	Grain Size[6]
TP-39-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-40-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-41-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-42-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-43-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-44-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-45-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-46-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-47-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-48-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-49-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
TP-50-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
MW-17-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
MW-19-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
MW-20-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
MW-21-2022	Soil	1-foot beneath tar, if present[7]	1	1		1		1				
MW-09-2020	Groundwater	5-10'	1	1	1	1	1	1	1	1	1	
MW-10S-2020	Groundwater	5-15'	1	1	1	1	1	1	1	1	1	
MW-10D-2020	Groundwater	24.5-29.5'	1	1	1	1	1	1	1			
MW-11S-2020	Groundwater	5-15'	1	1	1	1	1	1	1	1	1	
MW-11D-2020	Groundwater	36.5-41.5	1	1	1	1	1	1	1			
MW-12S-2020	Groundwater	5-15'	1	1	1	1	1	1	1	1	1	
MW-12D-2020	Groundwater	27-32'	1	1	1	1	1	1	1			
MW-18-91	Groundwater	8-18'	1	1	1	1	1	1	1	1	1	
MW-18D-05	Groundwater	25-40'	1	1	1	1	1	1	1			
MW-13-2020	Groundwater	6-11'	1	1	1	1	1	1	1	1	1	
MW-17S-2022	Groundwater	TBD	1	1	1	1	1	1	1	1	1	
MW-17D-2022	Groundwater	TBD	1	1	1	1	1	1	1			
MW-19S-2022	Groundwater	TBD	1	1	1	1	1	1	1	1	1	
MW-19D-2022	Groundwater	TBD	1	1	1	1	1	1	1			
MW-20S-2022	Groundwater	TBD	1	1	1	1	1	1	1	1	1	
MW-20D-2022	Groundwater	TBD	1	1	1	1	1	1	1			
MW-21S-2022	Groundwater	TBD	1	1	1	1	1	1	1	1	1	
MW-21D-2022	Groundwater	TBD	1	1	1	1	1	1	1			
PZ-01-2020	Groundwater	5-15'	1	1	1	1	1	1	1	1	1	
PZ-02-2020	Groundwater	5-15'	1	1	1	1	1	1	1	1	1	
PSED-07	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-08	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-09	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-10	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD

TABLE 1

SAMPLING PLAN FOR REMEDIAL INVESTIGATION PHASE II AT TONAWANDA COKE SITE 108

Sample ID	Sample Medium	Depth[1]	TCL VOCs	TCL SVOCs (total)[2,4]	TCL SVOCs (dissolved)[3]	TAL Metals (total)[2]	TAL Metals (dissolved)[3]	Cyanide (total)[2]	Cyanide (dissolved)[3]	TOC	Biodegradation Indicators[5]	Grain Size[6]
PSED-11	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-12	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-13	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-14	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-15	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-16	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-17	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-18	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-19	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-20	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
PSED-21	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'; 5-6'; 6-7'; 7-8'; 8-9'; 9-10'		11		11				11		TBD
SW-6-2022	Surface Water	TBD	1	1		1		1				
SW-7-2022	Surface Water	TBD	1	1		1		1				
SW-8-2022	Surface Water	TBD	1	1		1		1				
SW-9-2022	Surface Water	TBD	1	1		1		1				
SW-10-2022	Surface Water	TBD	1	1		1		1				
SD-11-2022	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'	6	6		6		6		6		
SD-12-2022	Sediment	0-0.5'; 0.5-1'; 1-2'; 2-3'; 3-4'; 4-5'	6	6		6		6		6		
SD-13-2022	Sediment	0.0.5'; TBD[8]		TBD		TBD				TBD		
SD-14-2022	Sediment	0.0.5'; TBD[8]		TBD		TBD				TBD		

Notes:

1. Depth of soil samples deeper than 1 ft bgs will be dependent upon soil/fill conditions obsered. Groundwater sample depths correspond to screened interval; for wells not installed yet, screened interval will depend upon hydrogeologic conditions observed. Niagara river sediment samples will be collected to 10 ft bml and wetland sediment samples will be collected to 5 ft bgs, unless refusal is encountered at a shallower depth. Surface water samples will be collected at mid-water depth; therefore, sample depth will be determined in the field based on water depth.
2. "Total" constituents indicate the field sample is unfiltered. Applicable to groundwater samples only.
3. "Dissolved" constituents indicates the field sample is field filtered. Applicable to groundwater samples only.
4. For all sediment samples, SVOC analysis will include analysis for the 34 PAHs necessary for comparison to Sediment Guidance Values (SGVs), as specified in Screening and Assessment of Contaminated Sediment (NYSDEC 2014). For all soil and sediment samples, SVOC analysis will include 1,4-dioxane.
5. Biodegradation indicators consist of total nitrogen, nitrate, ferrous iron, total/dissolved iron, manganese, sulfate, sulfide, methane, total organic carbon, chloride, and alkalinity.
6. A subset of sediment samples representative of the range of sediment conditions observed in the field will be analyzed for grain size via hydrometer (ASTM D7928) and/or sieve analysis (ASTM D6913).
7. Soil samples will be collected from the 1-ft interval beneath tar, if present. If tar is not observed, a soil sample will be collected from a depth interval where soil exhibits staining, odor, or elevated PID readings. If no field indications of impacts a sample will be collected from the middle depth of fill material (test pits) or from the middle of the proposed well screen (soil borings/monitoring wells).
8. Storm drain sediment samples will be collected in 6-inch intervals to refusal. It is not anticipated that more than 6 inches of material will be present.

TABLE 2

PROPOSED SAMPLE COORDINATES FOR DATA GAP INVESTIGATION AT TONAWANDA COKE SITE 108

Location ID	Easting (feet)[1]	Northing (feet)[1]	Location Purpose
TP-39-2022	1,053,085.59	1,085,076.99	Test Pit
TP-40-2022	1,053,157.74	1,085,122.34	Test Pit
TP-41-2022	1,053,005.20	1,085,136.77	Test Pit
TP-42-2022	1,053,153.62	1,085,198.62	Test Pit
TP-43-2022	1,053,001.08	1,085,221.29	Test Pit
TP-44-2022	1,053,106.21	1,085,264.58	Test Pit
TP-45-2022	1,053,479.32	1,085,157.39	Test Pit
TP-46-2022	1,053,423.66	1,085,256.34	Test Pit
TP-47-2022	1,053,497.87	1,085,274.89	Test Pit
TP-48-2022	1,053,316.47	1,085,340.85	Test Pit
TP-49-2022	1,053,514.36	1,085,363.53	Test Pit
TP-50-2022	1,053,555.59	1,085,505.76	Test Pit
MW-17-2022	1,053,043.96	1,084,944.13	Monitoring Well Pair (Shallow and Deep)
MW-19-2022	1,052,969.74	1,085,109.44	Monitoring Well Pair (Shallow and Deep)
MW-20-2022	1,052,939.38	1,085,261.25	Monitoring Well Pair (Shallow and Deep)
MW-21-2022	1,053,290.49	1,085,252.15	Monitoring Well Pair (Shallow and Deep)
PZ-01-2020	1,054,103.28	1,085,217.39	Monitoring Well (Shallow)
PZ-02-2020	1,053,752.43	1,085,730.19	Monitoring Well (Shallow)
SW-6-2022	1,052,772.02	1,085,463.50	Surface Water Sample
SW-7-2022	1,052,887.13	1,085,340.72	Surface Water Sample
SW-8-2022	1,052,935.72	1,085,067.03	Surface Water Sample
SW-9-2022	1,053,314.00	1,084,771.92	Surface Water Sample
SW-10-2022	1,053,456.69	1,084,526.18	Surface Water Sample
PSED-07	1,052,705.52	1,085,623.37	Sediment Sample
PSED-08	1,052,656.92	1,085,611.86	Sediment Sample
PSED-09	1,052,773.30	1,085,509.54	Sediment Sample
PSED-10	1,052,717.96	1,085,503.63	Sediment Sample
PSED-11	1,052,756.26	1,085,416.18	Sediment Sample
PSED-12	1,052,775.67	1,085,328.09	Sediment Sample
PSED-13	1,052,922.94	1,085,353.51	Sediment Sample
PSED-14	1,052,839.80	1,085,338.16	Sediment Sample
PSED-15	1,052,833.91	1,085,251.13	Sediment Sample
PSED-16	1,053,182.41	1,084,781.43	Sediment Sample
PSED-17	1,053,118.62	1,084,725.25	Sediment Sample
PSED-18	1,053,255.34	1,084,687.89	Sediment Sample
PSED-19	1,053,156.30	1,084,595.22	Sediment Sample
PSED-20	1,053,279.14	1,084,521.94	Sediment Sample
PSED-21	1,053,304.49	1,084,432.64	Sediment Sample
SD-11-2022	1,054,361.48	1,085,697.77	Wetland Sample
SD-12-2022	1,054,427.23	1,085,364.31	Wetland Sample
SD-13-2022	1053137.798	1085616.973	Storm Drain Sample
SD-14-2022	1052798.877	1085518.494	Storm Drain Sample

Notes:

1. Coordinates are provided in US Survey Feet in NY State Plane, North American Datum of 1983 (NAD83)

FIGURES

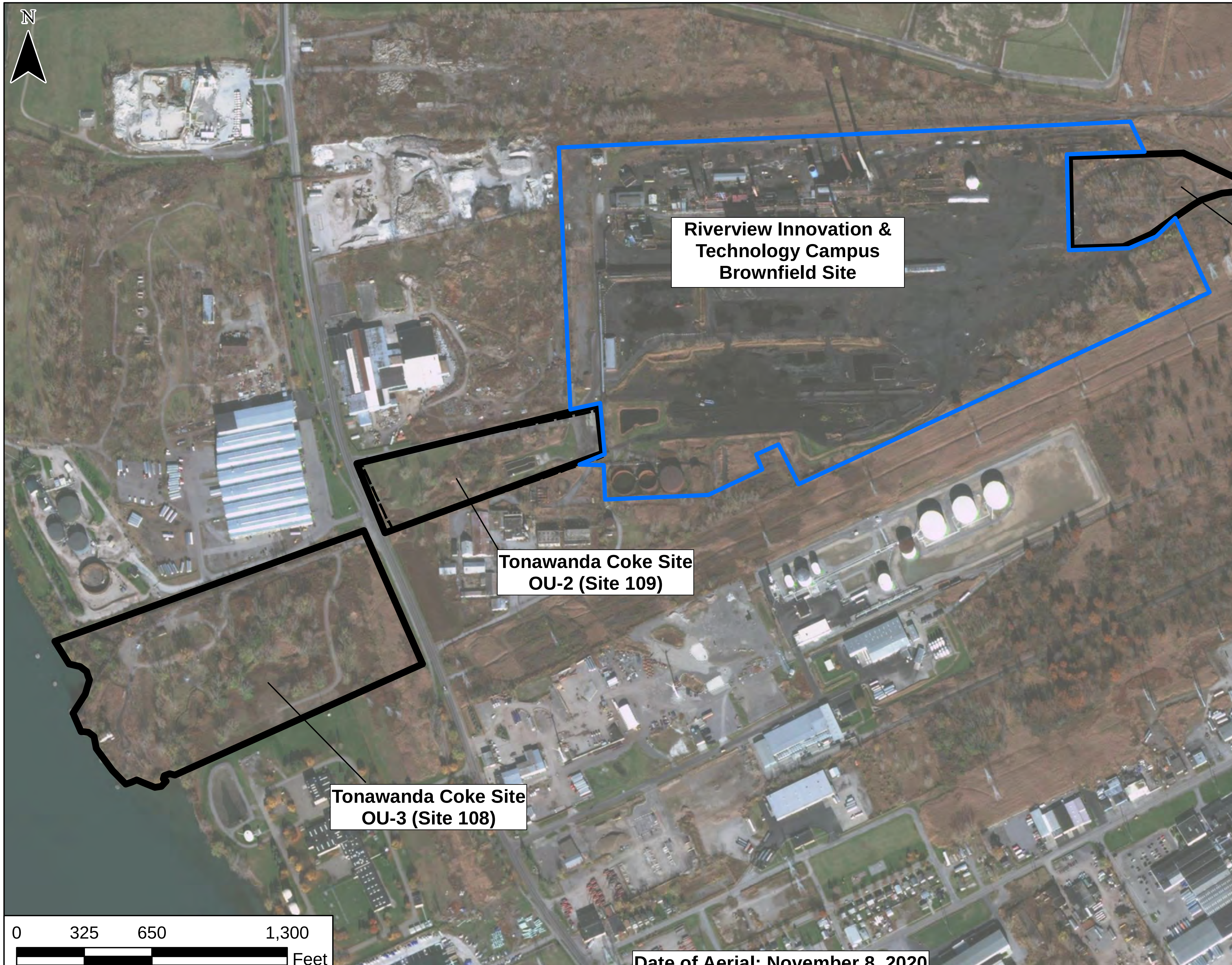


Figure 1

Honeywell Tonawanda Coke Site 108 Tonawanda New York

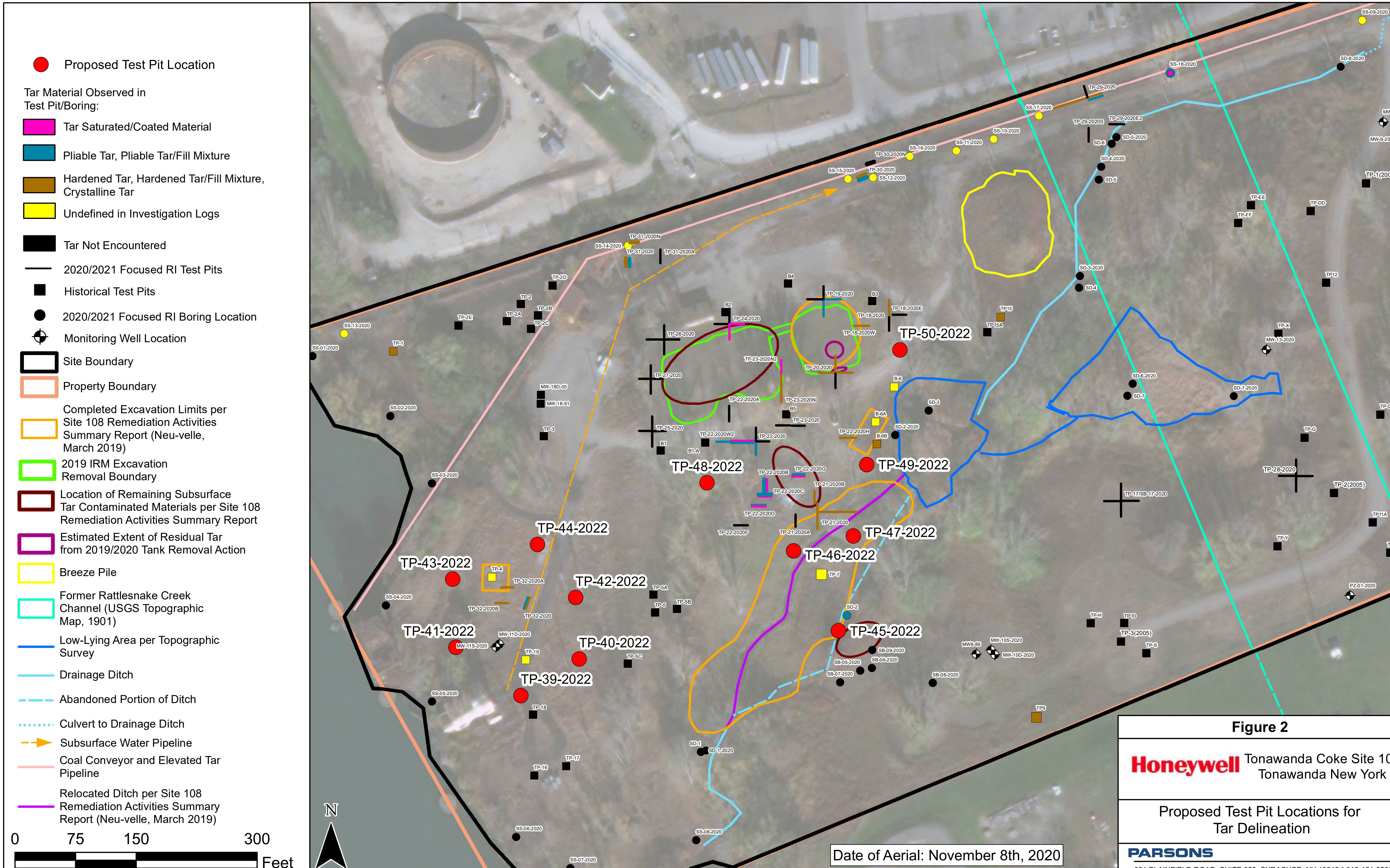
Location of Site 108

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

Plot Date: 5/26/2022 Plotted By: J. Domanski

Document Path: Q:\GIS\Hon_Syracuse\Tonawanda Coke\MXDs\108 Data Gaps WP\Fig 1 - Site 108 Location.mxd



Plotted By: J. Domanski

Plot Date: 5/6/2022

Document Path: Q:\GIS\Hon_Syracuse\Tonawanda Coke\MXDs\108 Data Gaps WP\Fig 2 - Proposed Tar Test Pits.mxd

Figure 3

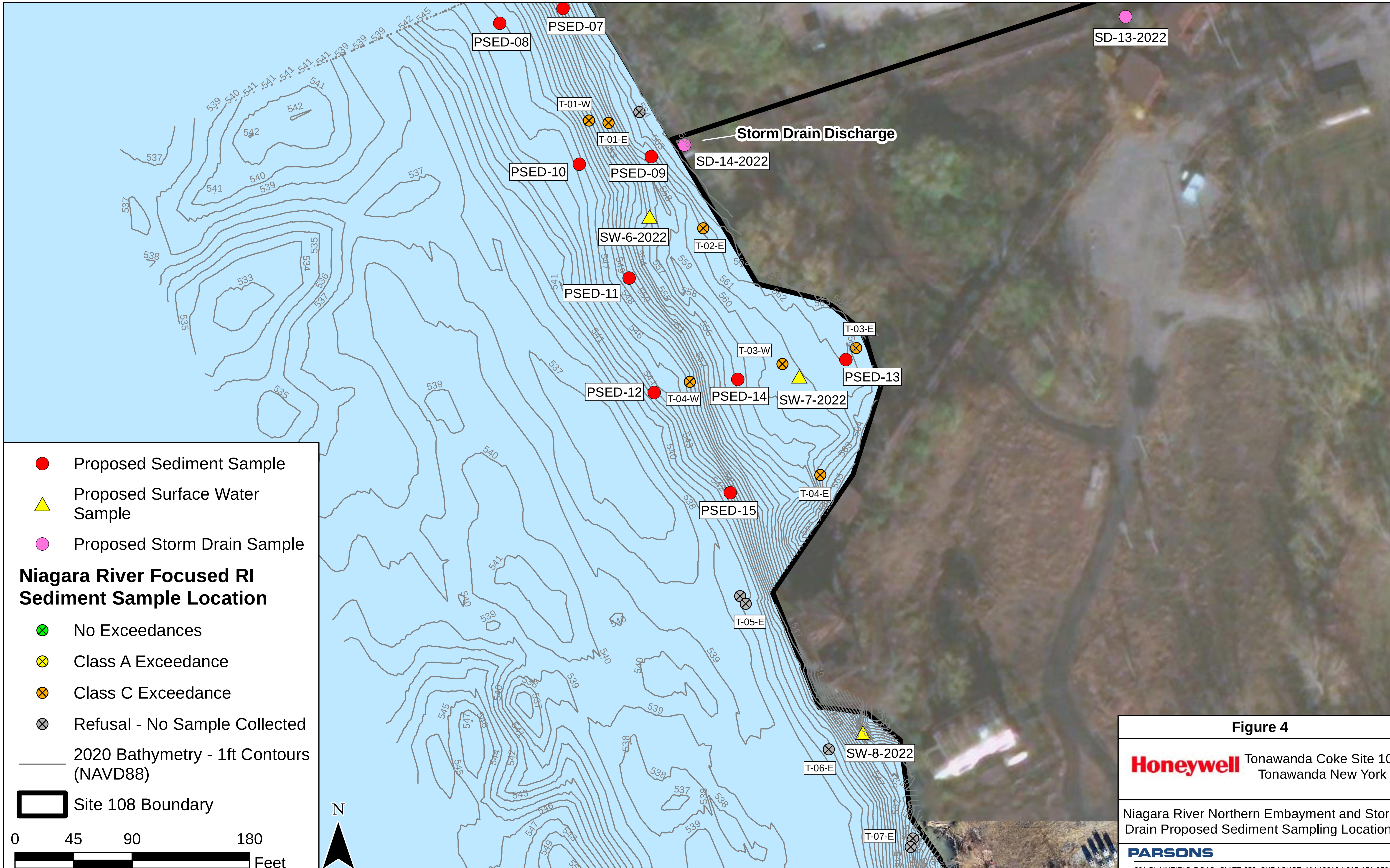
Honeywell Tonawanda Coke Site 108
Tonawanda New York

Proposed Monitoring Well Locations

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

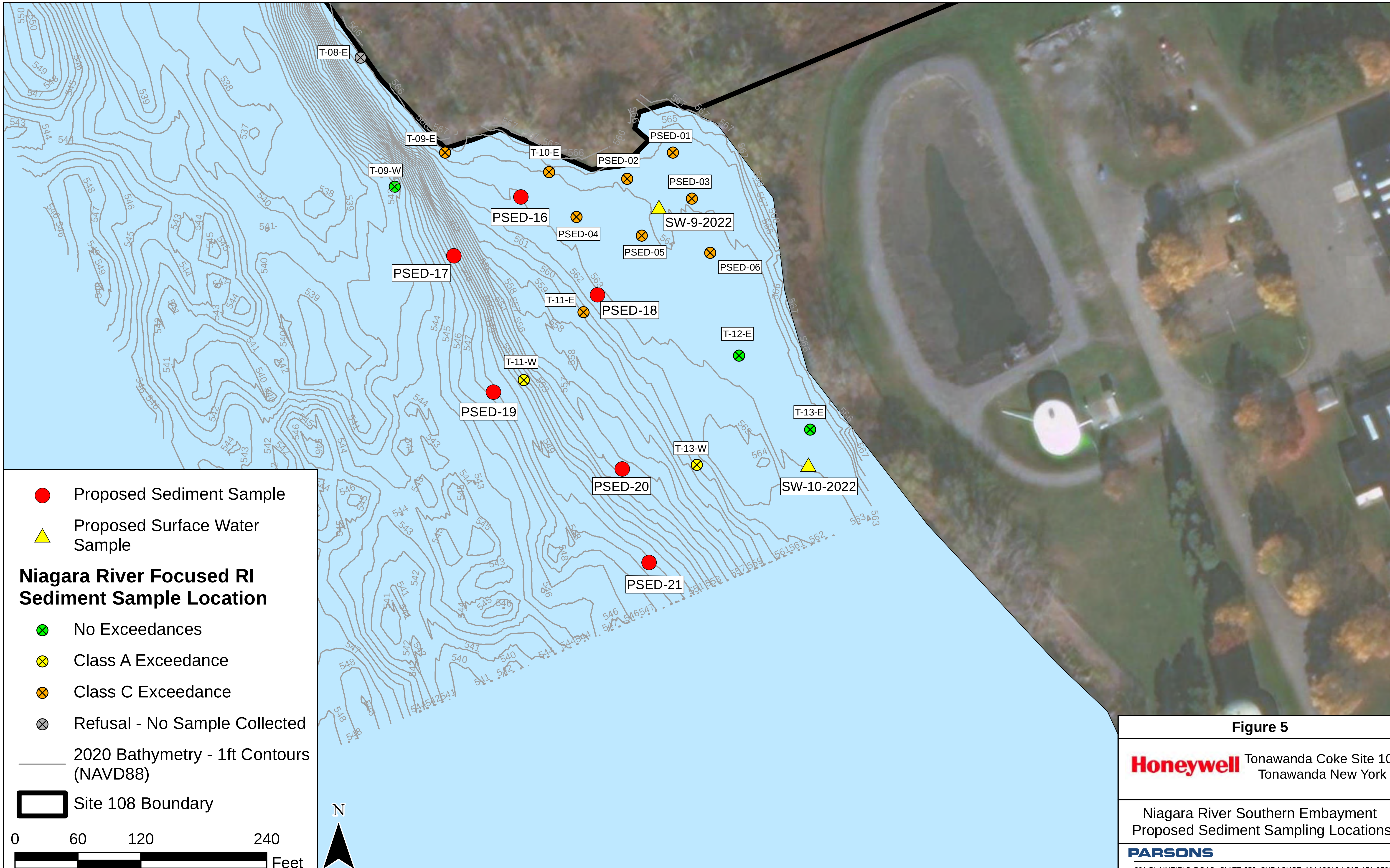
Plot Date: 5/26/2022 Plotted By: J. Domanski

Document Path: Q:\GIS\Hon_Syracuse\Tonawanda Coke\MXDs\108 Data Gaps WP\Fig 3 - Proposed Monitoring Well Locations.mxd



Plot Date: 5/26/2022

Document Path: Q:\GIS\Hon_Syracuse\Tonawanda Coke\MXDs\108 Data Gaps WP\Fig 4 - North Shoreline Proposed Sediment Locations.mxd



Plot Date: 5/26/2022

Document Path: Q:\GIS\Hon_Syracuse\Tonawanda Coke\MXDs\108 Data Gaps WP\Fig 5 - South Shoreline Proposed Sediment Locations.mxd

Figure 6

Honeywell Tonawanda Coke Site 108
Tonawanda New York

Proposed Wetland Sample Locations

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

Document Path: Q:\GIS\Hon_Syracuse\Tonawanda Coke\MXDs\108 Data Gaps WP\Fig 6 - Wetland A Proposed Sample Locations.mxd

ATTACHMENT 1 HYDRAULIC CONDUCTIVITY TESTING SOP

STANDARD OPERATING PROCEDURE FOR CONDUCTING HYDRAULIC CONDUCTIVITY TESTING

Equipment and Supplies

- Field Book or field log forms;
- Project plans;
- PPE in accordance with the HASP;
- PID or other monitoring equipment;
- Water level meter (WLM) and/or electronic oil/water interface probe (EIP);
- Slug made of inert, PFAS-free materials (see FSP);
- Pressure transducers and cables;
- Pocket PC or laptop;
- Polypropylene rope;
- Graduated 5-gallon buckets;
- Decontamination supplies;
- Plastic sheeting;
- Clear tape, duct tape.

Test Procedures

These tests involve observing the recovery of water levels toward an equilibrium level after an initial perturbation. The perturbation may be either a sudden rise (Falling Head Test) or fall (Rising Head Test) in water level. During a slug test, an inert rod of known volume will be quickly introduced into the well to cause a water level rise. Following equilibration of the water level, the slug is quickly removed to lower the water level. Procedures and equipment requirements may vary depending on the rate of the water-level recovery. Each well will be tested in accordance with the following procedures:

1. Determine the type of test to be performed based on the following
    - If the screened interval of the well straddles the water table, only use a rising head test;
    - if the screened interval of the well is submerged within water, then a rising and falling head test should be conducted.
2. Record appropriate data on a K-Test Log. An example K-Test Log is included with this SOP.
3. Clean the downhole equipment (e.g. pressure transducer, associated cables and lines, bailer/slug) following the decontamination procedures specified in the FSP prior to initiating testing at each well.
4. Measure and record the static water level in the well. Note that only wells which have recovered to static level conditions (following development, or sampling) should be tested.
5. Pressure transducers typically contain Teflon® or other waterproof components. Care should be taken to avoid conducting slug testing before groundwater sampling in the same well. ideally, conduct slug testing after groundwater sampling is conducted for PFAS. if slug testing is performed prior to collection of groundwater samples being analyzed for PFAS, an equipment blank should be collected from the transducer on the day of the slug testing.

6. Connect the pressure transducer to the data logger and lower the transducer into the well to a depth that will not interfere with the insertion of the slug, but that does not exceed the operating range of the transducer.
7. Secure the position of the transducer by clamping the transducer cable to the well casing with a rubber-covered clamp. If the edges of the well casing are sharp, cover them with cloth or duct tape to protect the transducer cable.
8. Quickly create the water level perturbation by inserting the slug into the well. While there is no fixed requirement for the magnitude of the change in water level, it is suggested that a 20% instantaneous hydraulic head differential be created to allow collection of a suitable data set.
9. if a follow-up test is to be performed, allow the water level in the well to reach equilibrium prior to performing the next test. Repeat these procedures as necessary.

ATTACHMENT 2 K-TEST LOG

	K-TEST LOG	WELL ID

Site:	**Project #**	**Personnel:**	**Page 1 of**
Client:			
Project Loc.:	**File #**		**Start date**
Test Objective:		**Weather:**	**End date**

Well information	**K-Test Information**	**Minitroll/Transducer Info**
DTW (static head)	Screen:	Type
Well depth	Interval (ft)	SN #
LWC	Length (ft)	Model #
Measurements:	Fully submerged	PSI
TOC Casing Other	Partially submerged*	
Slug type:	Lithology:	Pocket PC: SN #
Solid PVC	Test Method:	Laptop: SN #
Length (ft)	Falling head	
	Rising head	Depth reading (ft)
Water	Head change during test (ft):	Depth minitroll (ft)
Length (ft)	Falling head	Time start
	Rising head	Time end
Well condition:	Recovery %: (95% optimal)	Time interval (sec/min)
Obstructions	Falling test	
Siltation	Rising test	* If partially submerged only rising test recommended.

Manually conducted K-Test:

Falling Test				Rising Test			
Date/Time	ET	Depth (ft)	Drawdown	Date/Time	ET	Depth (ft)	Drawdown

over →