Interim Remedial Measures Work Plan

Niacet Site
400 47th Street
Niagara Falls, New York
NYSDEC Brownfield Cleanup Program
Site No. C932172

Prepared for:

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October 2021

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Certification

I, Donald A. McCall, certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measures Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Respectfully submitted,

Donald A. McCall, P.E.

10/15/2021
Date

Quality information

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1. Introduction

This Interim Remedial Measure (IRM) Work Plan (WP) has been prepared by AECOM Technical Services, Inc. (AECOM) on behalf of Union Carbide Corporation (UCC) (Participant) for the Niacet Site Brownfield Cleanup Program (BCP) Site (No. C932172) (the Site) located at 400 47th Street in the City of Niagara Falls, New York (**Figure 1-1**). Site investigation and remediation activities are being managed within the BCP pursuant to the Brownfield Cleanup Agreement (BCA) between New York State Department of Environmental Conservation (NYSDEC) and UCC, dated February 11, 2019.

In February 2021, Niacet Corporation (Niacet), the property owner and facility operator, notified NYSDEC and AECOM of plans to begin work on a site infrastructure improvement project. The primary project elements are construction of a trailer parking pad in the southeast corner of the property, re-alignment of the site access road, and construction of a 3,500 square foot truck scale building. Following discussions with NYSDEC, the decision was made to perform the trailer parking pad and road re-alignment work as an IRM within the BCP. Due to an accelerated construction schedule for the truck scale building, that work proceeded outside of the BCP consistent with NYSDEC's concurrence. A change of use form summarizing the truck scale construction project information was submitted to NYSDEC on April 30, 2021.

AECOM has prepared this IRMWP to provide a detailed description of IRM activities to be implemented at the Site related to Niacet's construction of the above described Site infrastructure improvements. The approximate locations and extent of the infrastructure improvements are depicted on the figure provided by Niacet and provided in **Appendix A**. The activities in this IRMWP will be carried out in general accordance with the NYSDEC's Department of Environmental Remediation (DER)-10 (Technical Guidance for Site Investigation and Remediation) issued May 3, 2010.

2. Site Description and History

2.1 Site Description

The Site is currently operated by Niacet, a producer of propionates and acetates, focusing on the pharmaceutical, food and feed industries. The Site is located at 400 47th Street, within the City of Niagara Falls, Niagara County, New York and is comprised of one lot (Lot 160.06.3-2.1) approximately 19.15 acres in size. Current building uses include office, laboratory, production, warehouse, and maintenance operations (**Figure 2-1**). These are predominantly brick and cinder block buildings occupying the western portion of the property. Numerous aboveground storage tanks (ASTs) are located in several different areas of the Site. A railroad spur enters the Site from the south providing rail access for the Site from the CSX Transportation railroad right-of-way. The remainder of the property consists of asphalt and gravel roadways, parking lots, foundations from former buildings, a concrete lined cooling pond, and open areas containing industrial fill. The setting is urban.

The topography of the Site is generally flat in the northern half of the Site (north of a former drainage ditch that was culverted over known as Pike Creek). South of Pike Creek, topography gently slopes to the south from about 578 feet (ft) above mean sea level (amsl) to 571 ft amsl with an overall topographic change of approximately 7 ft from the highest to lowest points. Surrounding properties are of similar elevation. The Site infrastructure improvement activities covered under this IRMWP are located in the southeastern portion of the property.

2.2 Adjacent Properties

The Site is currently zoned (I2) industrial and the anticipated future use of the property is industrial/manufacturing. The Site is currently used for manufacturing and processing. Adjacent properties are primarily industrial. The Site is bordered on the east by the former Electro Metals facility and on the south by other industrial properties. Niagara Falls Boulevard borders the north side of the Site. The Site is bounded to the west by 47th Street, with additional industrial properties located across 47th Street. The site is accessed via Gate 9 off of Simmons Avenue, a dirt road at the south property line. The nearest residential area is located approximately 0.2 mile northwest of the Site (**Figure 2-2**).

2.3 Site History

Historical documentation indicates that the Site has a history of industrial use manufacturing various chemicals and was initially constructed in 1925-26 and operated as the Niacet Chemical Company. The plant originally produced acetaldehyde, paraldehyde, aldol, and crotonaldehyde. Production of acetic acid by the oxidation of acetaldehyde began in 1928. The manufacture of sodium acetate and other acetates began in 1935. Vinyl acetate production was added in 1937 and increased steadily up through the late 1950’s. Mercury salts were utilized as a catalyst in the acetate production process. In 1945, the Niacet Chemicals Company became the Niacet Chemicals Division of U.S. Vanadium Corporation. In 1951, the Niacet Chemicals Division became the Niacet Plant of the Union Carbide and Carbon Corporation. At about the same time the idle Carbide and Carbon Chemicals Company methanol plant was added to the Niacet Plant. A fumigant known as Carboxide was manufactured in the methanol plant. Production of acetaldehyde and acetic acid was discontinued in 1952. These types of substances have uses in industrial and pharmaceutical processes to make other chemicals, including food additives, and in regulating acidity, etc. The acetates have uses as additives for cements, paints, glues and as well as other manufacturing processes. In 1957, the name of the facility owner/operator was changed to Union Carbide Corporation (UCC).

In 1978, Niacet purchased the property from UCC. Niacet currently manufactures specialty chemical products for food, pharmaceutical, cosmetics, and industrial applications. Chemicals currently produced include:

- sodium acetate
- sodium diacetate
- calcium proprionate
- sodium phenoxy acetate
- monochloroacetic acid
- hydrochloric acid
- sodium acetate trihydrate
- sodium and calcium stearoyl lactylates
- sodium propionate
- anhydrous HCL
- anionic surfactants

2.4 Previous Investigations in Proposed IRM Construction Area

2.4.1 Site Investigations 2002-2004

UCC contracted URS Corporation (now AECOM) to characterize the extent of mercury contamination discovered at the Niacet property. Based on review of the historical Site information, four areas were identified where mercury had been used, recovered, or disposed. An initial Site Investigation (SI) was conducted by URS between April 29 and May 23, 2002 (URS, 2002). The SI consisted of a soil gas screening survey, excavation of test trenches, and collection of soil and groundwater samples in accordance with the NYSDEC-approved Work Plan. Eight soil samples were collected for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) Metals, Toxicity Characteristic Leaching Procedure (TCLP) metals, and polychlorinated biphenyls (PCBs). The NYSDEC collected split samples from four of the test trench soil samples and analyzed them for VOCs, SVOCs, pesticides, PCBs, and TAL metals.

Additional investigations were conducted during May and June 2004. A Final Supplemental Site Investigation Report was issued in March 2006 (URS, 2006). The SSI consisted of completing 108 soil borings on a roughly 100-ft grid in all open areas of the Site using direct push sampling methods and four off-site surface soil sampling locations. A total of 295 soil samples were collected from these borings. In general, three soil samples were collected from each boring: 1) a surface soil sample at 0-2 inch interval; 2) a composite sample of the fill material; and 3) a sample at the fill/silty clay interface.

Soil sample analyses focused mainly on mercury, with seven sample locations also analyzed for VOCs, SVOCs, PCBs, and metals in addition to mercury. **Figure 2-3** shows the non-mercury analytical results for all samples collected from 2002 to 2004 in or near the IRM construction area that exceed the NYSDEC Part 375 Industrial Use soil cleanup objectives (SCOs) (NYSDEC, 2006). The soil sample mercury analytical results for the surface soil, fill material, and top of natural soils from locations in or near the IRM area are shown on **Figures 2-4, 2-5, and 2-6**, respectively.

Seven overburden groundwater monitoring wells (MW-01 through MW-07) and 14 temporary overburden piezometers were also installed. Overburden groundwater elevation contours generated from water levels measured in June 2004 are shown on **Figure 2-7**. Of the seven wells installed, four wells were dry. Groundwater samples were collected from wells containing water (i.e., MW-01, MW-02, and MW-06). There were no groundwater samples collected in 2004 in the southern portion of the Site (i.e., south of Pike Creek).

2.4.2 Radiological Surveys & Characterization Activities February 2012

In February 2012, Niacet contracted with Los Alamos Technical Associates, Inc. (LATA) to perform a cursory gamma walkover survey (GWS) to investigate the possible presence of technologically enhanced naturally occurring radioactive material (TENORM) in near-surface soils. The survey results were summarized in a letter report dated February 6, 2012 (LATA, 2012a). This survey was requested based on Niacet's concerns over recent discoveries during construction activities of radiological slag materials in soil on the adjacent Norampac site. The cursory GWS was followed by a more detailed "100% GWS" survey of specific focus areas. The survey results indicated three small localized areas in the "southeast field", located within the current IRM project parking area (**Figure 2-8**), containing TENORM elevated above the expected background and/or conventional screening guidance of 10,000 counts per minute (cpm). Readings from the three areas ranged from 30,000 to 45,000 cpm. The detailed survey results were documented in a letter report dated February 16, 2012 (LATA, 2012b).

LATA performed additional sampling and analysis of these areas from July 10 to 11, 2012. The field activities included advancing soil borings using a 3-inch outer diameter core sampler. Gamma surveys were performed at each sampling location for the ground surface, the soil cores, and within the open borehole. In addition, samples were submitted for radiological laboratory testing for select radionuclides. Elevated gamma survey and laboratory testing results were identified at the southeast focus area boring locations HSB-2, HSB-3, and HSB-4 all located within the planned IRM parking area. The results of additional characterization are presented in a letter report dated August 27, 2012 (LATA, 2012c).

2.4.3 Interim Remedial Measures 2013 and 2014

Excavations were conducted in 2013 and 2014 to remove areas known of visible, elemental mercury-contaminated soils as part of an IRM. These activities were conducted in accordance with the IRMWP, dated November 2012 (URS, 2012). The main component of the IRM was excavation based on visual observation of mercury in soil or soils exceeding the TCLP criteria. A total of 14,333 tons of elemental mercury impacted soils were removed from the site and transported to Stablex, Inc. in Quebec for treatment and disposal. The extents of the visible/elemental mercury impacted areas excavated from 2013 to 2014 are shown on **Figure 2-9**.

2.4.4 Test Pit Investigations 2014-2015

Following completion of the IRM excavations in 2014, AECOM completed 55 additional test pits (TP-22 through TP-76) to delineate the extent of visible mercury (**Figure 2-9**). Soil excavated from test pits was inspected for evidence of visible mercury beads. Soil was also screened for mercury using a field x-ray fluorescence (XRF) instrument. Soil samples from two of these test pits were submitted for analysis of both total and TCLP mercury. The results of test pit observations are summarized in **Table 2-1**. From these test pits it was determined that there were additional areas containing visible/elemental mercury (**Figure 2-9**).

2.4.5 Mercury Speciation Soil Sampling December 2016

In December 2016, AECOM performed an evaluation to determine if detectable mercury in areas where no visible/elemental mercury was present were more indicative of mercury salts. Eight test pits were completed at locations where previous test pits had been negative for visible mercury. Eight soil samples were collected and submitted to Brooks Applied Labs of Bothell, WA for speciation analyses to evaluate mercury salts content. The results of the evaluation determined that the areas where visible/elemental mercury is not present are comprised of mercury salts. A Technical Memorandum evaluating possible alternative SCOs was submitted to the NYSDEC in May 2017 (AECOM, 2017). The memorandum is currently under review by the NYSDEC.

2.4.6 Phase 1 Remedial Investigation 2020

In June and July 2020, AECOM completed Phase 1 Remedial Investigation (RI) field activities including completion of 18 soil borings across the Site. No soil borings were completed within the footprint of either the parking area or the proposed gravel road alignment. However, three soil borings, SB-109, SB-110, and SB-119, were completed in the vicinity of the proposed IRM construction project. Analytes detected above Industrial Use SCOs primarily consisted of metals (i.e., arsenic and mercury) and benzo(a)pyrene (**Figures 2-10 and 2-11**). Mercury concentrations detected in these three borings ranged from 0.36 milligrams per kilogram (mg/kg) (SB-119 (3'-4')) to 171 mg/kg (SB-109 (2'-3')). Arsenic was detected at concentrations exceeding the Industrial Use SCO in SB-109 at 18.3 (SB-109 (0'-0.2')) and 40.5 mg/kg (SB-109 (2'-3')). Benzo(a)pyrene was detected at a maximum concentration of 1,100 mg/kg (SB-109 (2'-3')).

Groundwater monitoring well MW-10, completed during the Phase 1 RI, is located near the northern edge of the proposed parking area. Metals detected above NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 (NYSDEC, 1998) criteria included iron, magnesium, manganese, and sodium. These metals are naturally occurring and are not likely associated with historical site operations. The VOC chlorobenzene was detected at a concentration of 8.3 ug/L – just over the TOGS criteria of 5.0 ug/L. In addition, Perfluorooctanoic acid (PFOA) was detected at 14 nanograms per liter (ng/L) – just over the NYSDEC guidance value of 10 ng/L. Groundwater analytical results for monitoring well MW-10 are summarized on **Figure 2-12**. Groundwater is not expected to be encountered during site IRM activities.

2.5 IRM Area Soil Conditions

2.5.1 Parking Area

Six historical soil borings were located within the proposed parking area footprint; SB-001, SB-008, SB-014, SB-019, SB-081, and SB-082. Mercury analytical results for surface soil samples collected from 0 to 0.2 ft bgs ranged in concentration from 0.113 mg/kg to 166 mg/kg (**Figure 2-4**). Five of the six surface soil samples exceeded the Industrial Use SCO of 5.7 mg/kg. Mercury analytical results for subsurface soils collected from fill and native material are shown on **Figures 2-5 and 2-6**, respectively. Two subsurface soil samples exceeded the Industrial Use SCO – SB-019 (0-2 ft) at 59.3 mg/kg and SB-001 (2 ft) at 170 mg/kg. The soil sample collected from SB-019 at 2 ft bgs had an estimated mercury concentration of 0.069 mg/kg.

2.5.2 New Gravel Road Alignment

Only one historical soil boring, SB-027, is located within the new gravel road alignment. However, seven other historical soil borings were located near the new gravel road footprint; SB-002, SB-003, SB-009 SB-015, SB-020, SB-026, and SB-028. Mercury analytical results for surface soil samples collected from 0 to 0.2 ft bgs ranged in concentration from 1.9 mg/kg to 118 mg/kg (**Figure 2-4**). Seven of the eight surface soil samples exceeded the Industrial Use SCO of 5.7 mg/kg. Five fill samples exceeded the Industrial Use SCO at concentrations ranging from 14.2 (SB-015 (0 -3 ft)) to 1,320 mg/kg (TT-02 (2-3 ft).

2.6 Site Physical Characteristics

Information obtained during the previous investigations performed at the Site pertaining to topography, geology, and hydrogeology is summarized in the following sections.

2.6.1 Site Topography and Drainage

The Site is located in the Erie-Ontario Lowlands Physiographic Province. The U.S. Department of Agriculture’s Soil Conservation Service (USDA, 2019), has limited data for the Site, but identified the surface soils in the northern part of the Site as Cut and Fill land consisting of gravelly to very gravelly sandy loam, with 0 to 15 percent slopes. In the northern half of the Site, topography at the Site is generally level. South of Pike Creek, topography gently slopes to the south from about 578 ft amsl to 571 ft amsl. The nearest water body is the concrete lined cooling pond in the northeast portion of the Site. Additionally Pike Creek, which formerly flowed across the property and has since been contained within a buried 42-inch culvert, flows east to west through the center of the Site. The Pike Creek culvert discharges into the 47th Street sewer tunnel.

2.6.2 Site Geology

The Niacet facility rests on fill and glacial deposits consisting of lake bottom sediments and/or glacial till. Underlying the glacial deposits is the Lockport Dolomite formation. The Lockport formation underlies the entire city of Niagara Falls, and extends from the Niagara escarpment south to Grand Island. The overlying glacial deposits are typically very thin throughout the region, with an average thickness of approximately 10 ft. Groundwater within the Lockport formation is fracture controlled, as groundwater is only present in wells that intercept fractures within the bedrock. The overlying glacial deposits are insignificant producers of groundwater.

Based on the results of Site investigations, the stratigraphy specific to the Site consists of a fill layer extending across the whole Site. The fill layer is thin (e.g., 2 ft) in the northwest corner of the Site and gradually thickens to the south – reaching a thickness of 11 ft near Pike Creek and areas further south. The upper few inches to 2 ft of fill generally consists of coarse granular materials (e.g., coal, slag, gravel, cinder, and clinker) and industrial construction and demolition (C&D) debris. This “upper fill unit” is underlain by a "lower fill unit" generally consisting of a red-brown silty clay with large amounts of gravel and C&D debris.

The fill materials in the northern portion of the Site typically extend down to the top of the underlying bedrock surface, whereas in the southern portion of the Site (i.e., south of Pike Creek), they are underlain by naturally occurring silty clays, comprised of both lacustrine and till materials. The silty clay materials vary in thickness from zero to more than 8 ft.

Bedrock consisting of hard dolomitic limestone was encountered in most of the borings in the northern half of the Site where the depth to bedrock is shallow (e.g., less than 2 ft). Bedrock slopes gradually to the south, reaching depths greater than 11 ft bgs.

2.6.3 Site Hydrogeology

No groundwater was observed in the overburden materials in the northern and western portions of the Site. In these areas, groundwater occurrence presumably is below the top of the bedrock surface. In the remainder of the Site, groundwater was observed within the overburden material. In general, overburden groundwater flow is from north to south-southeast in the eastern half of the Site. In the southeastern corner and the western half of the Site, overburden flow is to the west and is influenced by the unlined brick sewer tunnel running north-south under 47th Street. Groundwater contours from June 2004 are shown in **Figure 2-7**.

3. Objectives

The primary objectives of the IRM are to; 1) oversee and document site improvement activities being completed by Niacet; and 2) reduce or eliminate the potential exposure of existing and/or future Site users to surface and near-surface soils containing Site-specific contaminants of concern (COCs) above SCOs. This IRMWP describes how the Site improvement activities will be completed consistent with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May, 2010 with updates through April 2019 (NYSDEC, 2010) to meet these objectives.

4. IRM Activities

This section of the IRMWP provides a detailed description of IRM activities to be implemented at the Site related to Niacet's construction of Site infrastructure improvements. As the representative to the remedial participant, UCC, AECOM will oversee Niacet's performance of site construction activities to document compliance with this IRMWP. AECOM will prepare an IRM Construction Completion Report (CCR) as discussed in Section 6.0 below.

4.1 Erosion and Sediment Control

As the area of ground disturbance during this project will be greater than one acre, work activities will be performed in accordance with the requirements of the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity, Permit GP-0-20-001. Niacet's Contractor will submit a Notice of Intent (NOI) through the NYSDEC online "eNOI" to request coverage under this permit. The Contractor will prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Permit GP-0-20-001, and the SWPPP preparer will sign the "SWPPP Prepare Certification" statement on the NOI prior to submitting the form to NYSDEC.

During construction activities, erosion and sediment controls will be incorporated to minimize stormwater contacting disturbed areas and to control runoff. Silt fences will be installed around excavation areas and around the soil staging area. In addition to the silt fence, active soil stockpiles will also be covered with tarps.

All active stormwater catch basins within or near the work areas will be plugged so that no stormwater runoff can enter the Site drainage system. The Contractor will provide pumping equipment and storage capacity to manage stormwater from these work areas to prevent stormwater from leaving the Site.

4.2 Health and Safety Plan/Community Air Monitoring Plan

All onsite Contractors will be required to prepare a Health and Safety Plan (HASP) in accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 to protect their employees and onsite personnel in and around the proposed work areas. The HASP would include requirements for personnel protection and action levels, establish procedures, and specify health and safety controls, such as exclusion and decontamination zones. Compliance with the HASP will be maintained throughout the planned IRM action. It is expected that all intrusive Site work (e.g., soil excavation and potentially impacted soil handling operations) will be conducted under Level D personal protective equipment (PPE), but PPE levels would be adjusted as per the HASP, based on air monitoring results.

All site workers for the IRM construction activities will be required to have received the initial OSHA Hazardous Waste Operations (HAZWOPER) 40-hour health and safety training as well as annual 8-hour refresher training. In addition, due to the possible presence of elevated radiological material, workers will be required to obtain radiation safety awareness training.

Work zone/breathing zone air monitoring will be conducted in accordance with the Contractor's HASP and will include mercury vapor monitoring using a direct reading mercury vapor analyzer (MVA) (e.g., Jerome J405 MVA). Mercury vapor action levels, mitigation measures, and actions will also be described in the Contractor's HASP. Monitoring for fugitive dust and VOCs will be performed in accordance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) (NYSDOH, 2006) included as **Appendix B**. As part of CAMP monitoring activities, measurements for mercury vapors will be recorded at the upwind and downwind CAMP monitoring stations at a minimum frequency of hourly. Dust control measures will be implemented by the Contractor as required to meet the requirements of the HASP and CAMP. The measures to be taken in the event that CAMP action levels are exceeded are described in the VOC and Particulate Monitoring, Response Levels, and Actions sections of the CAMP.

4.3 Trailer Parking Area Construction

A new parking area for tractor-trailers will be constructed in the southeast portion of the Site. The location of the parking area is depicted on **Figures 2-3 through 2-11 and Appendix A**. The parking area measures approximately 143 ft x 360 ft, and will be constructed of crushed stone to a depth of 1 foot. The majority of the area will be excavated to a depth of 1 foot with excavated soil stockpiled at the designated soil stockpile area for subsequent characterization informing waste management. Following completion of excavation to a depth of one foot, a geotextile fabric/demarcation layer will be placed in the bottom of the excavation. The area will then be backfilled with compacted/rolled crushed stone.

Two existing concrete slabs are located within the proposed parking area (**Figures 2-3 through 2-11**). These slabs, totaling approximately 7,000 square feet, will be left in place and will not be excavated. These areas will be covered with approximately 3 inches of stone to match the surrounding grade of the remainder of the new parking area.

4.4 Access Road Re-alignment

The primary Site entrance is off of Simmons Avenue through Gate 9 located near the midpoint of the south fence line. An existing gravel access road continues from Gate 9 northward along the eastern portion of the Site (**Figures 2-3 through 2-11**). A truck scale building is currently being constructed within the existing access road alignment. Construction of the truck scale building by Niacet is not being performed under this IRMWP. Therefore, the road will be re-routed approximately 70 ft to the east to bypass the new truck scale building. The new gravel access road will be constructed of crushed stone to a depth of 1 foot in a similar manner as the parking area, and excavated soil will be stockpiled at the designated soil stockpile area for subsequent characterization informing waste management. The new road construction area will be approximately 24 ft wide by 500 ft long. Following completion of excavation to a depth of 12 to 16 inches, geotextile fabric/demarcation layer will be placed in the bottom of the excavation. Imported crushed stone fill material will then be placed and compacted/rolled.

4.5 New Stormwater Management Features and Lighting

Stormwater for the new parking area will be managed by the installation of new catch basins within the parking area as well as between the parking area and the new access road alignment. Catch basins will have invert depths from 24 to 36 inches. The catch basins will be connected to the existing Site stormwater drainage network using 8-inch polyvinyl chloride piping. Excavations for installation of catch basins and drain line will range from 12 to 48 inches deep. The approximate locations of stormwater catch basins and piping are shown in **Appendix A**. The trenches will be backfilled with crushed stone. Additional details regarding the stormwater management system are provided in **Appendix A**.

The new access road alignment will be graded to direct stormwater runoff to new and existing stormwater management features.

New lighting for the parking area will consist of installation of six new light poles around the perimeter along the north, south, and east sides. Excavations for light pole foundations will be approximately 18-inch diameter by 48-inch depth. Trenching for electrical conduit connecting the light poles will be approximately 24 inches deep.

4.6 Management of Potentially Radioactive Materials

The following procedures will be implemented to ensure the safety of all on-site personnel and proper detection, handling and disposal of any radioactive materials. For the purpose of this plan the guidance value is established as 10,000 CPM (approximately 1.5 times the area background) using a Ludlum Model 2221 meter with 44-10 probe. Continuous screening will be performed during excavation activities and will be used to characterize and segregate excavated material for disposition.

If material is identified as radioactive slag and is scanned in excess of 10,000 CPM, which is determined through the professional judgment of the radiological technician to be impacted, the material will be staged separately from other soil in DOT approved 55-gallon drums or in covered roll-off containers.

Minimization of the quantity of radioactive waste will be a high priority during the IRM construction activities. Radioactive waste generated during this work will be temporarily staged on-site within a designated area until approved for disposition. This material will be managed in accordance with federal, state, local, and Site permitting requirements, consistent with project procedures and license requirements for handling, storage, and transportation.

Segregated material exhibiting elevated radiological levels will be sampled and disposed of in accordance disposal facility and regulatory requirements.

4.7 Soil Stockpiles

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales or a silt sock will be used as needed near catch basins, surface waters and other discharge points. Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC.

Stockpiled soils not impacted with elevated radiological material will be sampled for waste characterization purposes prior to determination of final disposition. Sampling frequency is estimated to be one sample per 1,000 cubic yards of soil, but will be determined by the permitted disposal facility requirements. Stockpile samples will be sampled for the following estimated list of analytical methods, but the final list will be determined in coordination with the disposal facility:

- TCLP Metals,
- TCLP VOCs,
- TCLP SVOCs,
- TCLP Herbicides,
- TCLP Pesticides,
- pH,
- Free Liquids,
- PCBs,
- Cyanide (reactive),
- Sulfide (reactive),
- Total Petroleum Hydrocarbons (TPH)
- Total mercury

Soils/materials segregated due to elevated radiological levels will be sampled for waste characterization for determination of final disposition in accordance with federal, state, and local regulations.

4.8 Imported Fill Materials

Prior to import of fill to the Site, a request to Import/Reuse Fill or Soil will be prepared and submitted to the NYSDEC for review and approval. The request to Import/Reuse Fill or Soil will be accompanied by appropriate documentation detailing the source, sieve analysis, and laboratory results of applicable imported fill materials. Trucks entering the Site with imported materials will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

Crushed Stone – The crushed stone structural fill will be imported from a permitted quarry (e.g., Lafarge quarry in Lockport, New York). Sieve analysis test results for the imported stone material will be provided and will demonstrate less than 10% by weight material passing a size 80 sieve. Therefore, in accordance with DER-10, Section 5.4(e)5, chemical testing will not be required for this imported stone material.

4.9 Soil Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations. Trucks will be properly placarded and secured with covers. If loads contain wet material capable of producing free liquid, truck liners will be used. Trucks will enter and exit the Site through Gate 9 off of Simmons Avenue. This point will be inspected daily for evidence of offsite soil tracking. The Qualified Environmental Professional (QEP) will be responsible for ensuring that the egress point for truck and equipment transport from the Site is clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

4.10 Soil Disposal Off-Site

4.10.1 Soil Not Impacted with Elevated Radiological Material

Based on existing Site soil mercury analytical data, soil excavated and removed from the Site for offsite disposal will be considered as contaminated and regulated material and will be transported and disposed in accordance with all local, state (including 6NYCRR Part 360), and federal regulations unless and until testing demonstrates to the satisfaction of NYSDEC that it meets the applicable SCOs for the Site-related COCs.

It is anticipated that soil either considered contaminated (i.e., analytical testing has not been conducted to evaluate compliance with applicable SCOs) or soil determined to be contaminated (i.e., analytical testing has established the presence of contaminants exceeding applicable SCOs) requiring offsite landfill disposal will be transported to Allied Waste Niagara Falls Landfill located in Niagara Falls, New York. Soil transported for landfill disposal will be characterized per the landfill requirements prior to export from the Site.

4.10.2 Soil Impacted with Elevated Radiological Material

Based on results of waste characterization of the segregated radiologically impacted material, an appropriate transporter and disposal facility will be selected. Waste characterization will be performed by shippers experienced in identifying and classifying material, determining packaging requirements, and performing pre-shipment reviews. Waste shipments and disposal will be in accordance with applicable federal, state, and local regulations.

4.11 Temporary Controls and Site Safety

Water mist and other suitable methods will be used as deemed necessary by the guidelines provided in the CAMP to limit the spread of dust, dirt, and vapors/odors. The methods to control fugitive dust, dirt, and vapors/odors may include one or more of the following:

- Wetting equipment and excavation faces.
- Spraying water on buckets during excavation and dumping.
- Reducing excavation sizes.
- Temporarily covering the excavation with poly sheeting overnight, if needed, based upon the readings obtained from the CAMP.
- Covering portions of the excavation not actively being worked with poly sheeting to further suppress particulate and vapor migration.
- Using vapor suppression products such as ‘BioSolve,’ if necessary, as a vapor mitigation agent.
- Providing and maintaining all equipment needed to control dust, vapors, and odors prior to starting the excavation.

The CAMP will provide information on air monitoring, action levels, and engineering controls to address fugitive dust and/or vapors. Additionally, the IRM will consist of safely containing the project work area, maintaining traffic and access to the Site as needed to ensure safety of the public and Niacet workers.

In order to protect pedestrians as well as Site workers from the hazards associated with completing the IRM, appropriate precautionary measures will be taken to provide adequate safety measures. These safety measures will include (note: some of these measures may not be necessary for smaller excavations):

- Placing orange plastic construction/snow fencing or temporary chain link fencing around the work area to establish an exclusion zone.
- Placing orange plastic construction/snow fencing around any excavation required to be left open overnight.
- Donning high visibility vests, hard hats, and safety glasses on-site during IRM activities.
- Adhering to the Site-specific HASP.
- Placing signs around the perimeter of the work.

5. Reporting

Details of activities completed during the IRM will be included in an IRM CCR. The CCR will be completed in accordance with DER-10 Section 5.8, and will include figures stamped by a New York PE showing the surveyed excavation limits and as-built conditions. The CCR will be submitted for review by NYSDEC within 45 days following completion of the IRM activities discussed above.

6. Schedule

It is anticipated that implementation of the IRMWP will begin shortly after NYSDEC approval of this work plan and the standard three-day Dig Safely New York waiting period, as it is desired that these IRM activities be completed during the summer/fall of 2021. NYSDEC will be provided advance notification of the start of IRM site activities once scheduled. The field work is anticipated to require approximately 20 days to complete subsequent to implementation of the IRMWP. The IRM CCR will be submitted within 45 days of completion of Site work.

7. References

AECOM, 2017. Technical Memorandum Evaluation of Soil Cleanup Objectives for the Niacet Site, 47th Street, Niagara Falls, New York. May.

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

New York State Department of Health (NYSDOH), 2000. *Generic Community Air Monitoring Plan*. June 2000.

URS, 2002. Site Investigation Summary Report for the property at Niacet Corporation 47th Street, Niagara Falls, New York. October. 2002.

URS, 2006. Final Supplemental Site Investigation Report for the property at Niacet Corporation 47th Street, Niagara Falls, New York. March 2006.

URS, 2012. Interim Remedial Measures Work Plan for the property at Niacet Corporation 47th Street, Niagara Falls, New York. November.

FIGURES

Legend

Site Boundary

Source: © 2013 National Geographic Society, i-cubed;
1:24:000-scale USGS Topographic Quadrangles:
Niagara Falls, 1980; Tonawanda West, 1980

2,000 0 2,000 Feet

AECOM

UNION CARBIDE CORPORATION NIACET SITE
SITE LOCATION MAP

FIGURE 1-1

J:\Projects\11171085.00000\DB\GIS\ARCMAP\BCP RIWP1-01 SITE LOCATION.mxd 4/8/2019

Source: Bing Maps, 2020

120 0 120 Feet

AECOM

UNION CARBIDE CORPORATION NIACET SITE
SITE PLAN

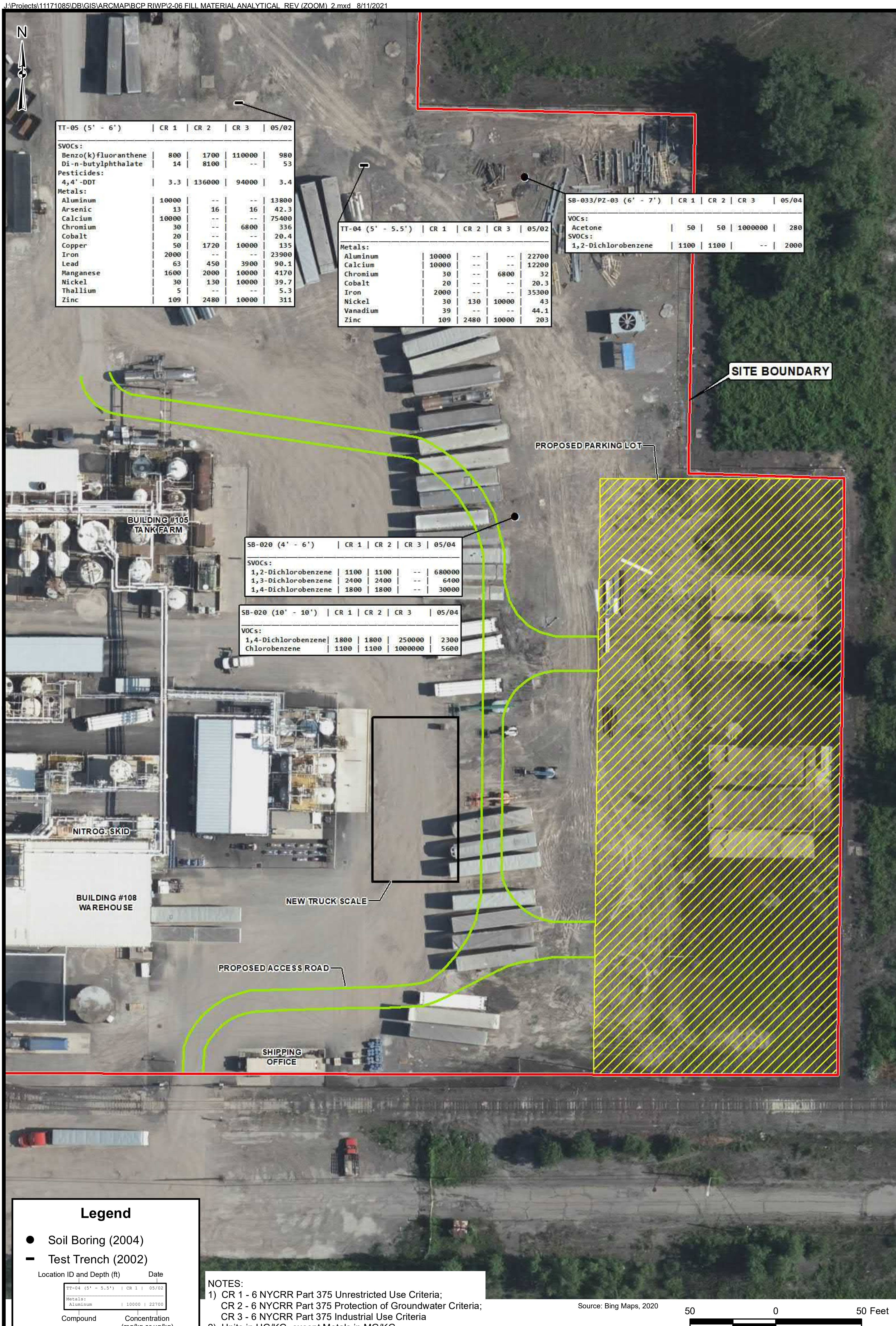
FIGURE 2-1

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\2-02 PROPERTY MAP.mxd 7/22/2021

AECOM

UNION CARBIDE CORPORATION NIACET SITE
PROPERTY MAP

FIGURE 2-2



TT-05 (5' - 6')	CR 1	CR 2	CR 3	05/02
SVOCs:				
Benzo(k)fluoranthene	800	1700	110000	980
Di-n-butylphthalate	14	8100	--	53
Pesticides:				
4,4'-DDT	3.3	136000	94000	3.4
Metals:				
Aluminum	10000	--	--	13800
Arsenic	13	16	16	42.3
Calcium	10000	--	--	75400
Chromium	30	--	6800	336
Cobalt	20	--	--	20.4
Copper	50	1720	10000	135
Iron	2000	--	--	23900
Lead	63	450	3900	90.1
Manganese	1600	2000	10000	4170
Nickel	30	130	10000	39.7
Thallium	5	--	--	5.3
Zinc	109	2480	10000	311

TT-04 (5' - 5.5')	CR 1	CR 2	CR 3	05/02
Metals:				
Aluminum	10000	--	--	22700
Calcium	10000	--	--	12200
Chromium	30	--	6800	32
Cobalt	20	--	--	20.3
Iron	2000	--	--	35300
Nickel	30	130	10000	43
Vanadium	39	--	--	44.1
Zinc	109	2480	10000	203

SB-033/PZ-03 (6' - 7')	CR 1	CR 2	CR 3	05/04
VOCs:				
Acetone	50	50	1000000	280
SVOCs:				
1,2-Dichlorobenzene	1100	1100	--	2000

SB-020 (4' - 6')	CR 1	CR 2	CR 3	05/04
SVOCs:				
1,2-Dichlorobenzene	1100	1100	--	680000
1,3-Dichlorobenzene	2400	2400	--	6400
1,4-Dichlorobenzene	1800	1800	--	30000

SB-020 (10' - 10')	CR 1	CR 2	CR 3	05/04
VOCs:				
1,4-Dichlorobenzene	1800	1800	250000	2300
Chlorobenzene	1100	1100	1000000	5600

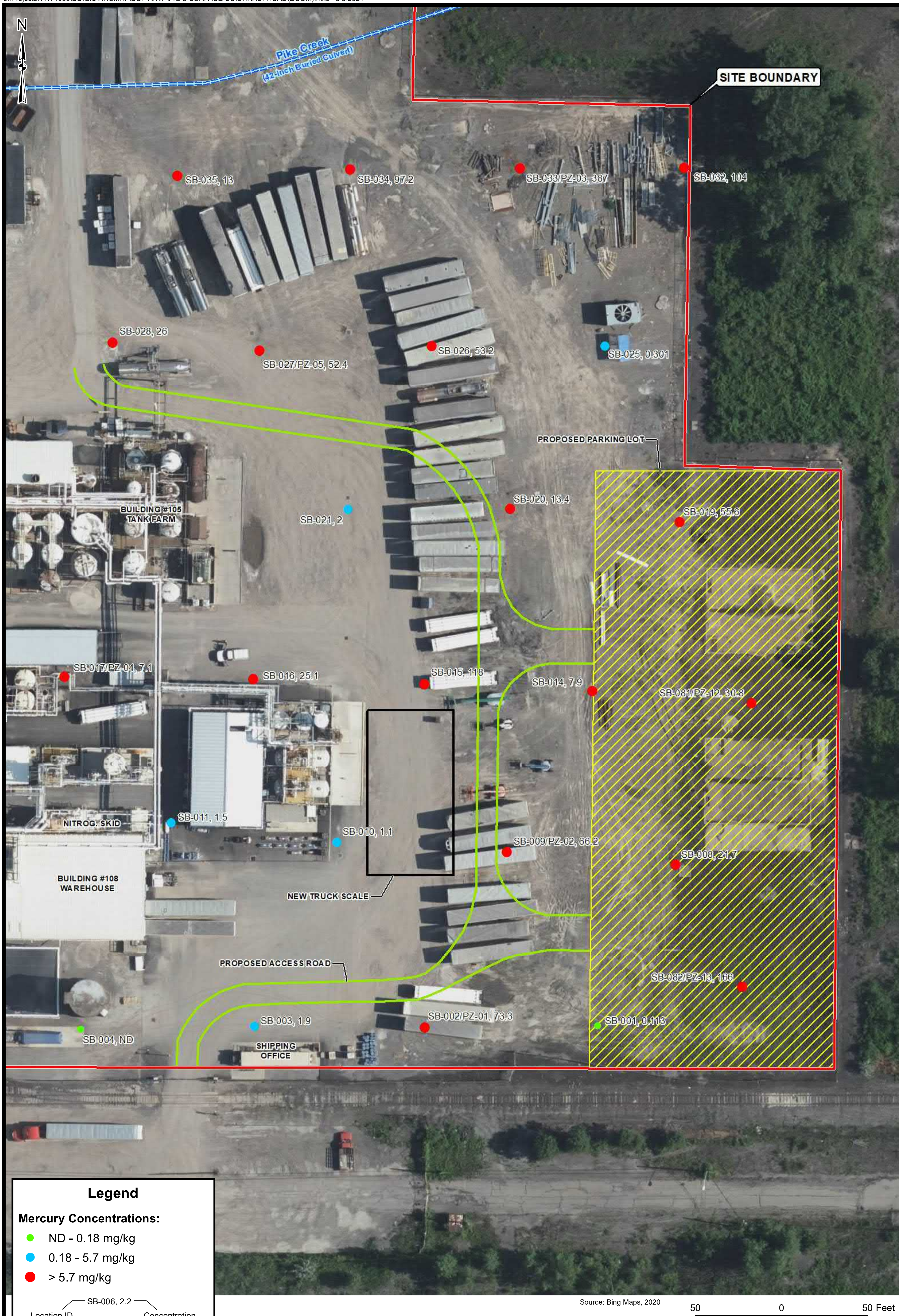
NOTES:
1) CR 1 - 6 NYCRR Part 375 Unrestricted Use Criteria;
CR 2 - 6 NYCRR Part 375 Protection of Groundwater Criteria;
CR 3 - 6 NYCRR Part 375 Industrial Use Criteria
2) Units in UG/KG, except Metals in MG/KG

AECOM

UNION CARBIDE CORPORATION NIACET SITE
SOIL ANALYTICAL RESULTS - EXCEEDANCES ONLY
VOCS, SVOCS, PCBS, AND METALS (EXCLUDING MERCURY)
2002-2004

FIGURE 2-3

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\FIG 8-SURFACE SOIL ANALYTICAL (ZOOM).mxd 8/5/2021



Legend

Mercury Concentrations:

- ND - 0.18 mg/kg
- 0.18 - 5.7 mg/kg
- > 5.7 mg/kg

SB-006, 2.2
Location ID Concentration

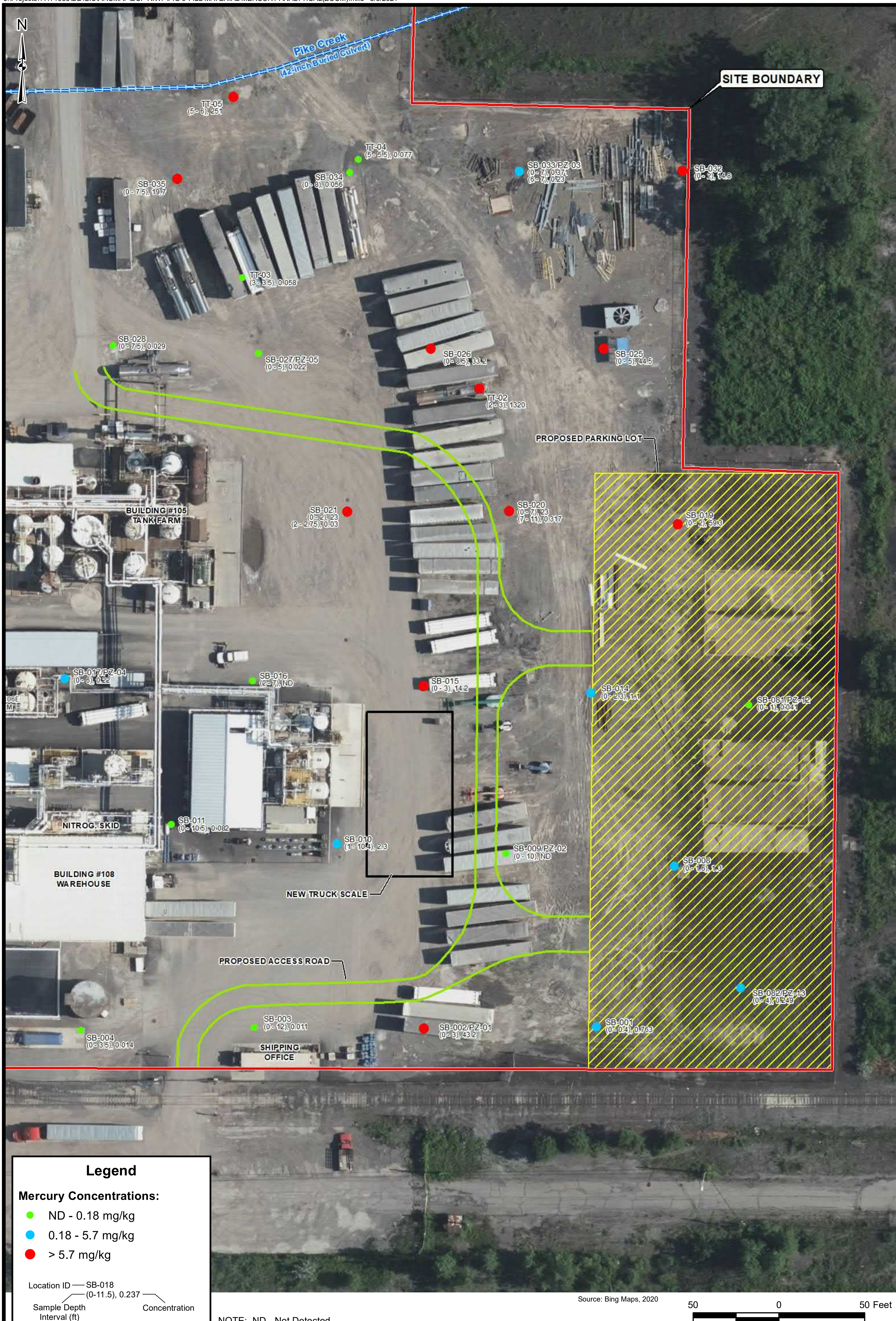
NOTE: ND - Not Detected

AECOM

UNION CARBIDE CORPORATION NIACET SITE
SURFACE SOIL MERCURY ANALYTICAL RESULTS
MAY 2004

FIGURE 2-4

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\FIG 9-FILL MATERIAL MERCURY ANALYTICAL(ZOOM).mxd 8/5/2021

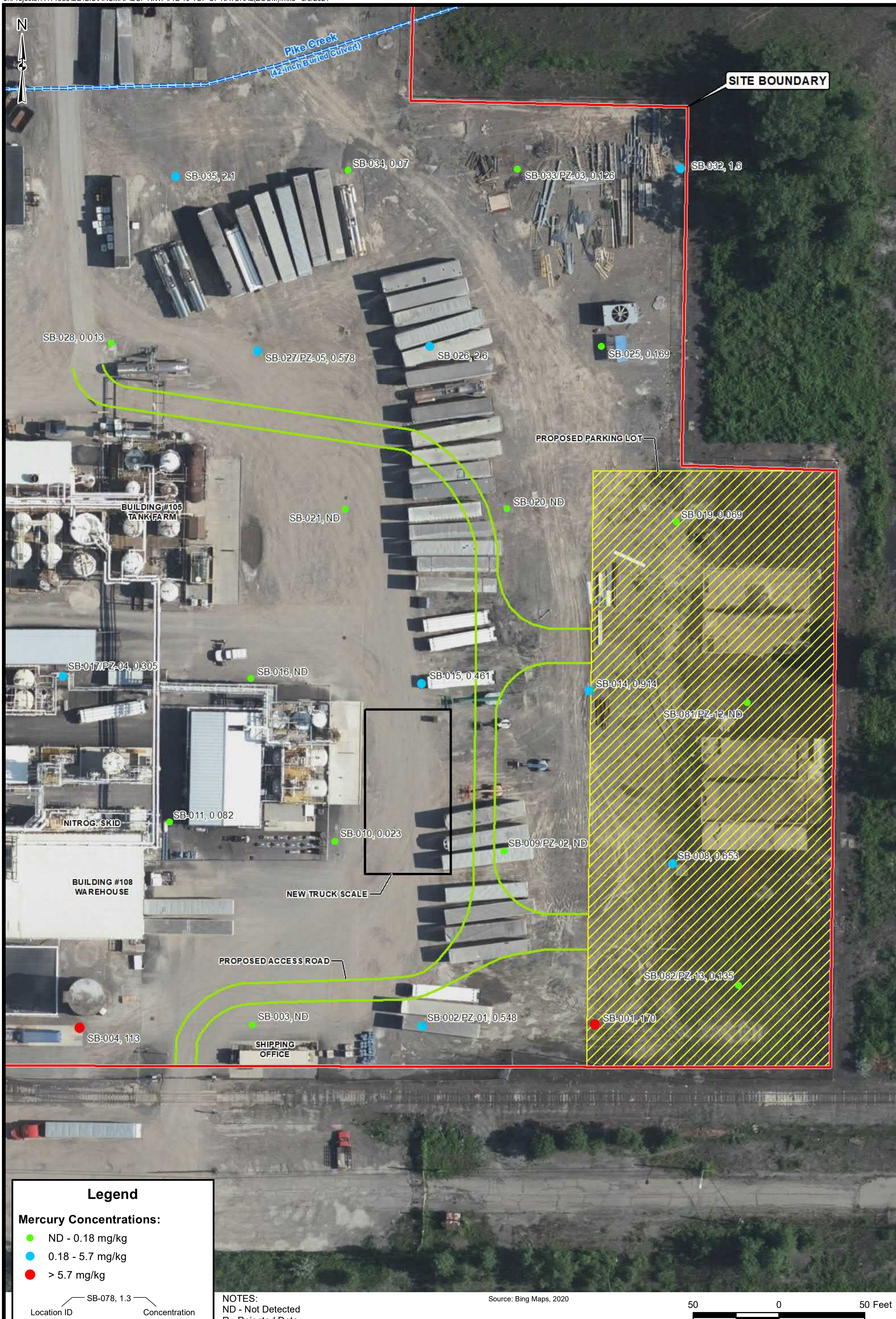


AECOM

UNION CARBIDE CORPORATION NIACET SITE
FILL SOIL MERCURY ANALYTICAL RESULTS
2002 - 2004

FIGURE 2-5

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\FIG 10-TOP OF NATURAL(ZOOM).mxd 8/5/2021

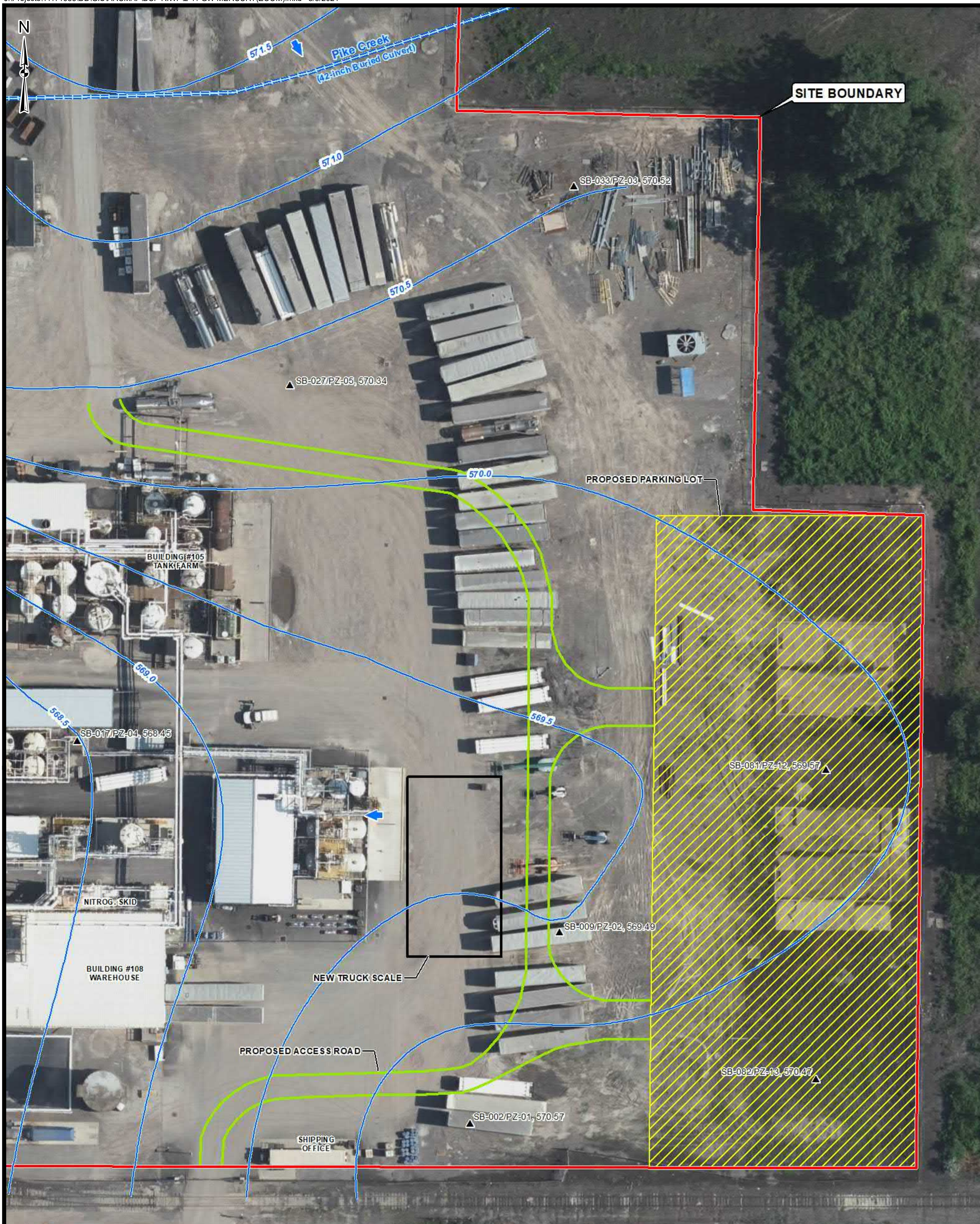


AECOM

UNION CARBIDE CORPORATION NIACET SITE
TOP OF NATURAL SOILS MERCURY ANALYTICAL RESULTS
MAY 2004

FIGURE 2-6

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\2-11 GW MERCURY(ZOOM).mxd 8/5/2021



Legend

- At Least One Compound Exceeds Criteria
- Monitoring Well
- Temporary Piezometer
- Groundwater Flow Direction
- Groundwater Elevation Contour

Location ID

MW-01	CRITERIA	UNFILTERED RESULT	FILTERED RESULT
Mercury	0.7	17.4	0.332

Compound

Concentration (µg/L)

NOTES:

1) For monitoring wells that were dry, an elevation corresponding to top of rock was assigned to allow contours to be generated. In reality, groundwater levels along the western side of the site are lower than shown.
2) Criteria - NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Class GA.

Source: Bing Maps, 2020

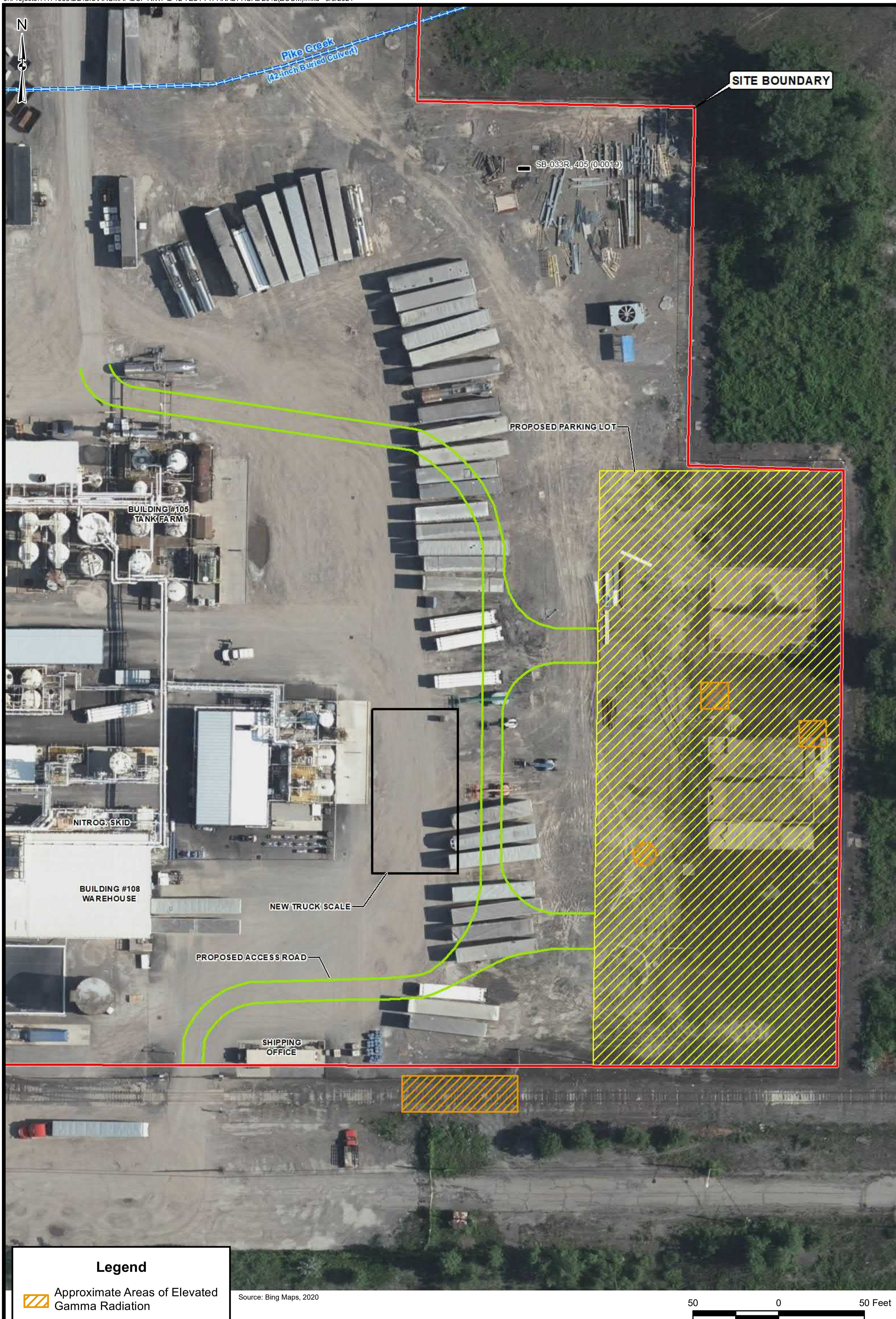
50 0 50 Feet

AECOM

UNION CARBIDE CORPORATION NIACET SITE
GROUNDWATER ELEVATION CONTOURS AND MERCURY ANALYTICAL RESULTS
JUNE 2004

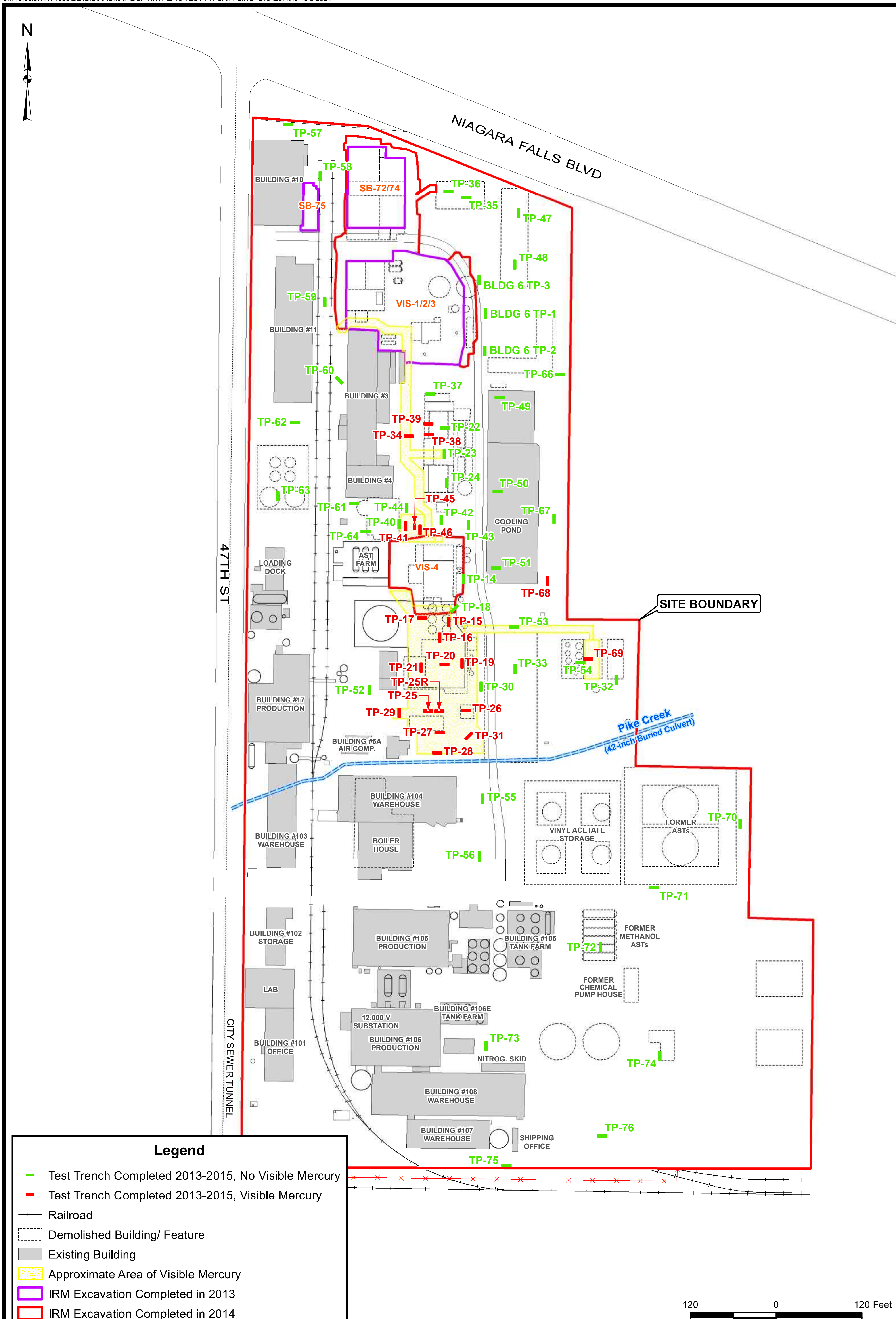
FIGURE 2-7

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\2-12 TEST PIT ANALYTICAL 2012(ZOOM).mxd 8/5/2021



AECOM	UNION CARBIDE CORPORATION NIACET SITE SUPPLEMENTAL SAMPLING INVESTIGATION (JANUARY 2012) TEST PIT ANALYTICAL RESULTS	FIGURE 2-8

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\2-10 TEST PIT SAMPLING_210426.mxd 5/5/2021



Legend

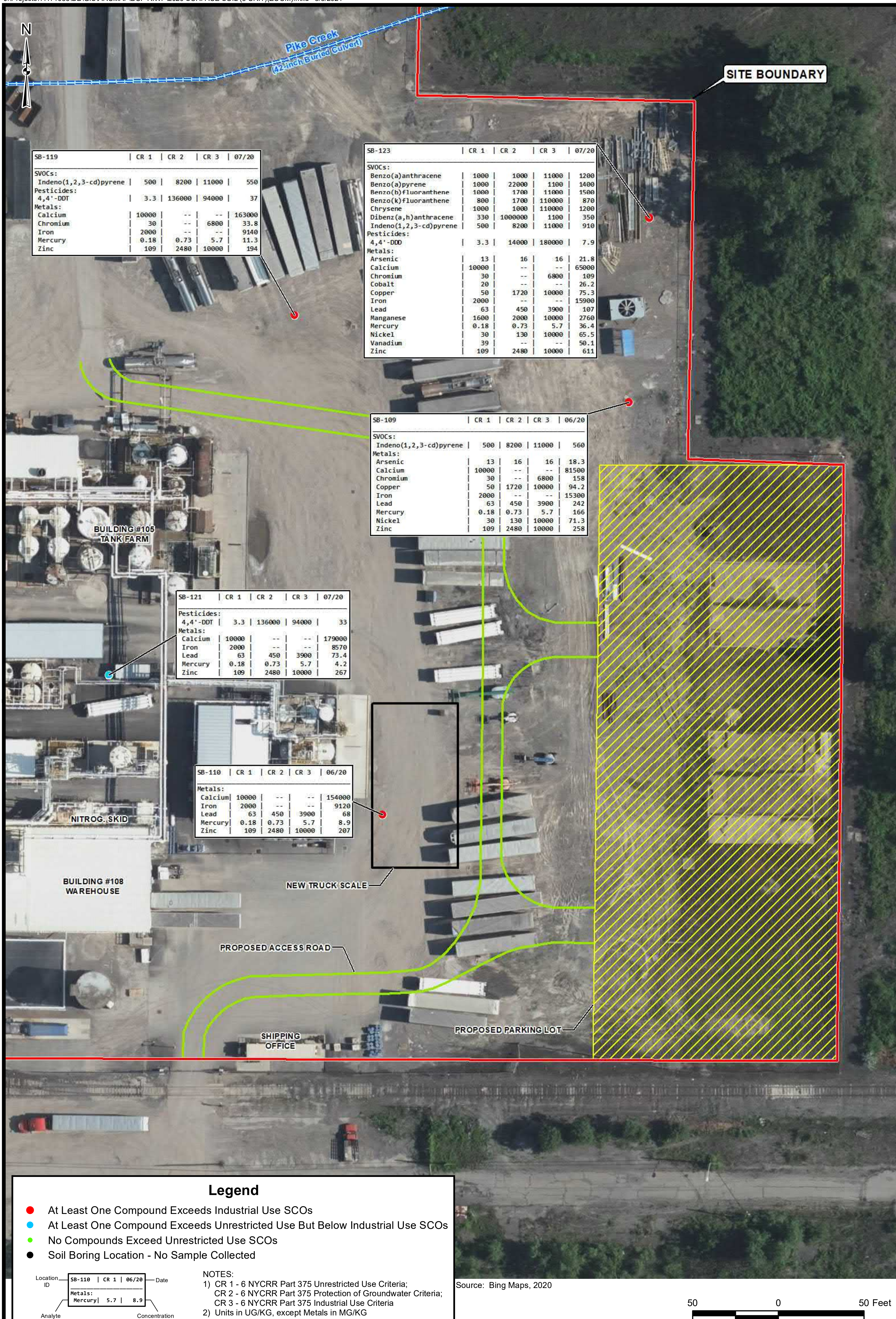
- Test Trench Completed 2013-2015, No Visible Mercury
- Test Trench Completed 2013-2015, Visible Mercury
- Railroad
- Demolished Building/ Feature
- Existing Building
- Approximate Area of Visible Mercury
- IRM Excavation Completed in 2013
- IRM Excavation Completed in 2014

AECOM

UNION CARBIDE CORPORATION NIACET SITE
TEST PIT LOCATIONS 2014-2015

FIGURE 2-9

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\2020 SURFACE SOIL (3 CRIT)(ZOOM).mxd 8/5/2021



SB-119	CR 1	CR 2	CR 3	07/20
SVOCs:				
Indeno(1,2,3-cd)pyrene	500	8200	11000	550
Pesticides:				
4,4'-DDT	3.3	136000	94000	37
Metals:				
Calcium	10000	--	--	163000
Chromium	30	--	6800	33.8
Iron	2000	--	--	9140
Mercury	0.18	0.73	5.7	11.3
Zinc	109	2480	10000	194

SB-123	CR 1	CR 2	CR 3	07/20
SVOCs:				
Benzo(a)anthracene	1000	1000	11000	1200
Benzo(a)pyrene	1000	22000	1100	1400
Benzo(b)fluoranthene	1000	1700	11000	1500
Benzo(k)fluoranthene	800	1700	110000	870
Chrysene	1000	1000	110000	1200
Dibenz(a,h)anthracene	330	1000000	1100	350
Indeno(1,2,3-cd)pyrene	500	8200	11000	910
Pesticides:				
4,4'-DDD	3.3	14000	180000	7.9
Metals:				
Arsenic	13	16	16	21.8
Calcium	10000	--	--	65000
Chromium	30	--	6800	109
Cobalt	20	--	--	26.2
Copper	50	1720	10000	75.3
Iron	2000	--	--	15900
Lead	63	450	3900	107
Manganese	1600	2000	10000	2760
Mercury	0.18	0.73	5.7	36.4
Nickel	30	130	10000	65.5
Vanadium	39	--	--	50.1
Zinc	109	2480	10000	611

SB-109	CR 1	CR 2	CR 3	06/20
SVOCs:				
Indeno(1,2,3-cd)pyrene	500	8200	11000	560
Metals:				
Arsenic	13	16	16	18.3
Calcium	10000	--	--	81500
Chromium	30	--	6800	158
Copper	50	1720	10000	94.2
Iron	2000	--	--	15300
Lead	63	450	3900	242
Mercury	0.18	0.73	5.7	166
Nickel	30	130	10000	71.3
Zinc	109	2480	10000	258

SB-121	CR 1	CR 2	CR 3	07/20
Pesticides:				
4,4'-DDT	3.3	136000	94000	33
Metals:				
Calcium	10000	--	--	179000
Iron	2000	--	--	8570
Lead	63	450	3900	73.4
Mercury	0.18	0.73	5.7	4.2
Zinc	109	2480	10000	267

SB-110	CR 1	CR 2	CR 3	06/20
Metals:				
Calcium	10000	--	--	154000
Iron	2000	--	--	9120
Lead	63	450	3900	68
Mercury	0.18	0.73	5.7	8.9
Zinc	109	2480	10000	207

Legend

- At Least One Compound Exceeds Industrial Use SCOs
- At Least One Compound Exceeds Unrestricted Use But Below Industrial Use SCOs
- No Compounds Exceed Unrestricted Use SCOs
- Soil Boring Location - No Sample Collected

Location ID — Date — Analyte — Concentration

SB-110	CR 1	06/20
Metals:		
Mercury	5.7	8.9

NOTES:
1) CR 1 - 6 NYCRR Part 375 Unrestricted Use Criteria;
   CR 2 - 6 NYCRR Part 375 Protection of Groundwater Criteria;
   CR 3 - 6 NYCRR Part 375 Industrial Use Criteria
2) Units in UG/KG, except Metals in MG/KG

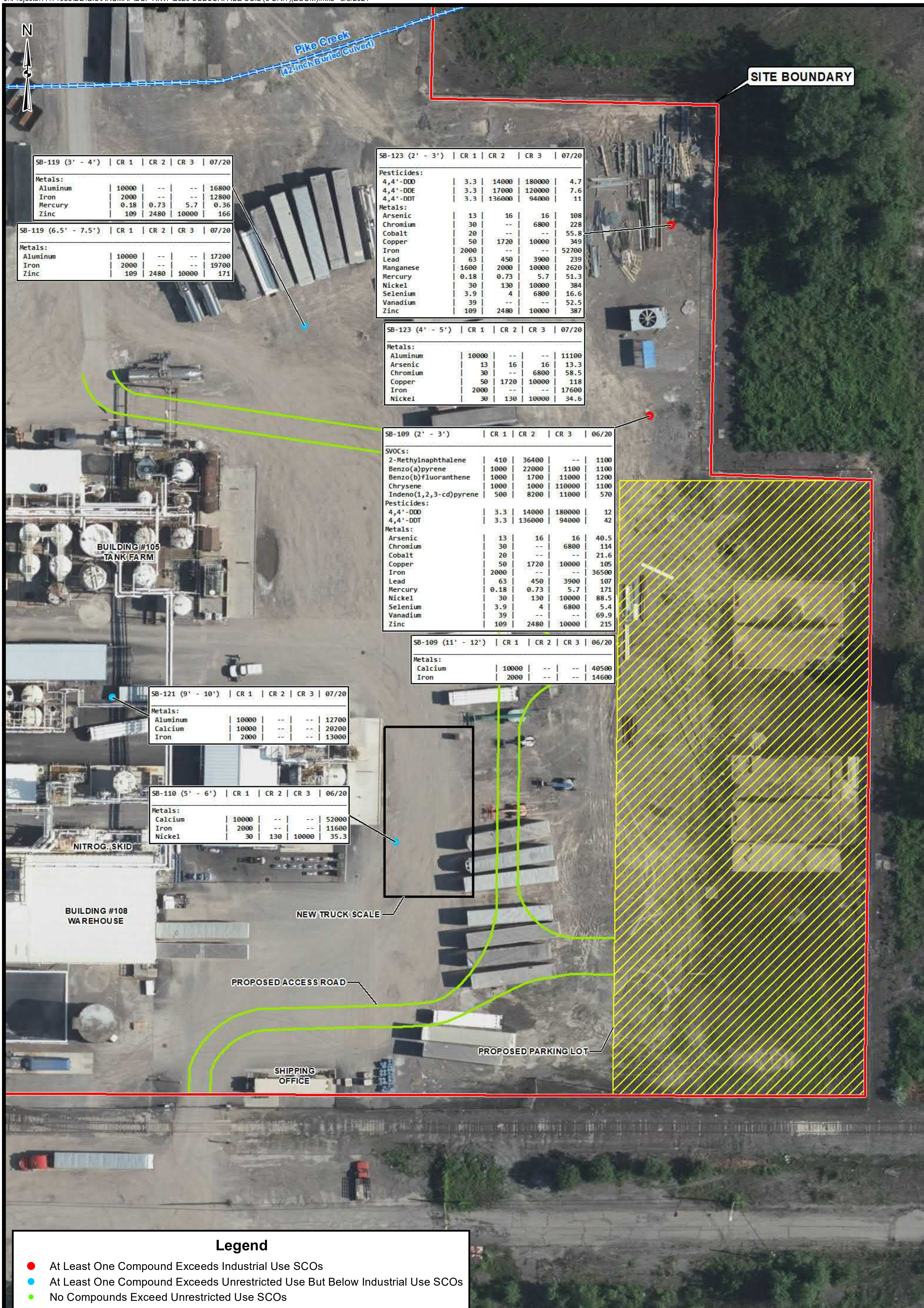
Source: Bing Maps, 2020

50 0 50 Feet

AECOM

UNION CARBIDE CORPORATION NIACET SITE
PHASE 1 RI SURFACE SOIL/SEDIMENT ANALYTICAL RESULTS EXCEEDING CRITERIA

FIGURE 2-10



SB-119 (3' - 4')	CR 1	CR 2	CR 3	07/20
Metals:				
Aluminum	10000	--	--	16800
Iron	2000	--	--	12800
Mercury	0.18	0.73	5.7	0.36
Zinc	109	2480	10000	166

SB-119 (6.5' - 7.5')	CR 1	CR 2	CR 3	07/20
Metals:				
Aluminum	10000	--	--	17200
Iron	2000	--	--	19700
Zinc	109	2480	10000	171

SB-123 (2' - 3')	CR 1	CR 2	CR 3	07/20
Pesticides:				
4,4'-DDD	3.3	14000	180000	4.7
4,4'-DDE	3.3	17000	120000	7.6
4,4'-DDT	3.3	136000	94000	11
Metals:				
Arsenic	13	16	16	108
Chromium	30	--	6800	228
Cobalt	20	--	--	55.8
Copper	50	1720	10000	349
Iron	2000	--	--	52700
Lead	63	450	3900	239
Manganese	1600	2000	10000	2620
Mercury	0.18	0.73	5.7	51.3
Nickel	30	130	10000	384
Selenium	3.9	4	6800	16.6
Vanadium	39	--	--	52.5
Zinc	109	2480	10000	387

SB-123 (4' - 5')	CR 1	CR 2	CR 3	07/20
Metals:				
Aluminum	10000	--	--	11100
Arsenic	13	16	16	13.3
Chromium	30	--	6800	58.5
Copper	50	1720	10000	118
Iron	2000	--	--	17600
Nickel	30	130	10000	34.6

SB-109 (2' - 3')	CR 1	CR 2	CR 3	06/20
SVOCs:				
2-Methylnaphthalene	410	36400	--	1100
Benzo(a)pyrene	1000	22000	1100	1100
Benzo(b)fluoranthene	1000	1700	11000	1200
Chrysene	1000	1000	110000	1100
Indeno(1,2,3-cd)pyrene	500	8200	11000	570
Pesticides:				
4,4'-DDD	3.3	14000	180000	12
4,4'-DDT	3.3	136000	94000	42
Metals:				
Arsenic	13	16	16	40.5
Chromium	30	--	6800	114
Cobalt	20	--	--	21.6
Copper	50	1720	10000	105
Iron	2000	--	--	36500
Lead	63	450	3900	107
Mercury	0.18	0.73	5.7	171
Nickel	30	130	10000	88.5
Selenium	3.9	4	6800	5.4
Vanadium	39	--	--	69.9
Zinc	109	2480	10000	215

SB-109 (11' - 12')	CR 1	CR 2	CR 3	06/20
Metals:				
Calcium	10000	--	--	40500
Iron	2000	--	--	14600

SB-121 (9' - 10')	CR 1	CR 2	CR 3	07/20
Metals:				
Aluminum	10000	--	--	12700
Calcium	10000	--	--	20200
Iron	2000	--	--	13000

SB-110 (5' - 6')	CR 1	CR 2	CR 3	06/20
Metals:				
Calcium	10000	--	--	52000
Iron	2000	--	--	11600
Nickel	30	130	10000	35.3

Legend

- At Least One Compound Exceeds Industrial Use SCOs
- At Least One Compound Exceeds Unrestricted Use But Below Industrial Use SCOs
- No Compounds Exceed Unrestricted Use SCOs

Location ID — SB-112 (3.3' - 4.3') | CR 1 | 06/20 — Date
Depth (feet)
Analyte — Metals: Mercury | 5.7 | 4.1 — Concentration

NOTES:
1) CR 1 - 6 NYCRR Part 375 Unrestricted Use Criteria;
CR 2 - 6 NYCRR Part 375 Protection of Groundwater Criteria;
CR 3 - 6 NYCRR Part 375 Industrial Use Criteria
2) Units in UG/KG, except Metals in MG/KG

Source: Bing Maps, 2020

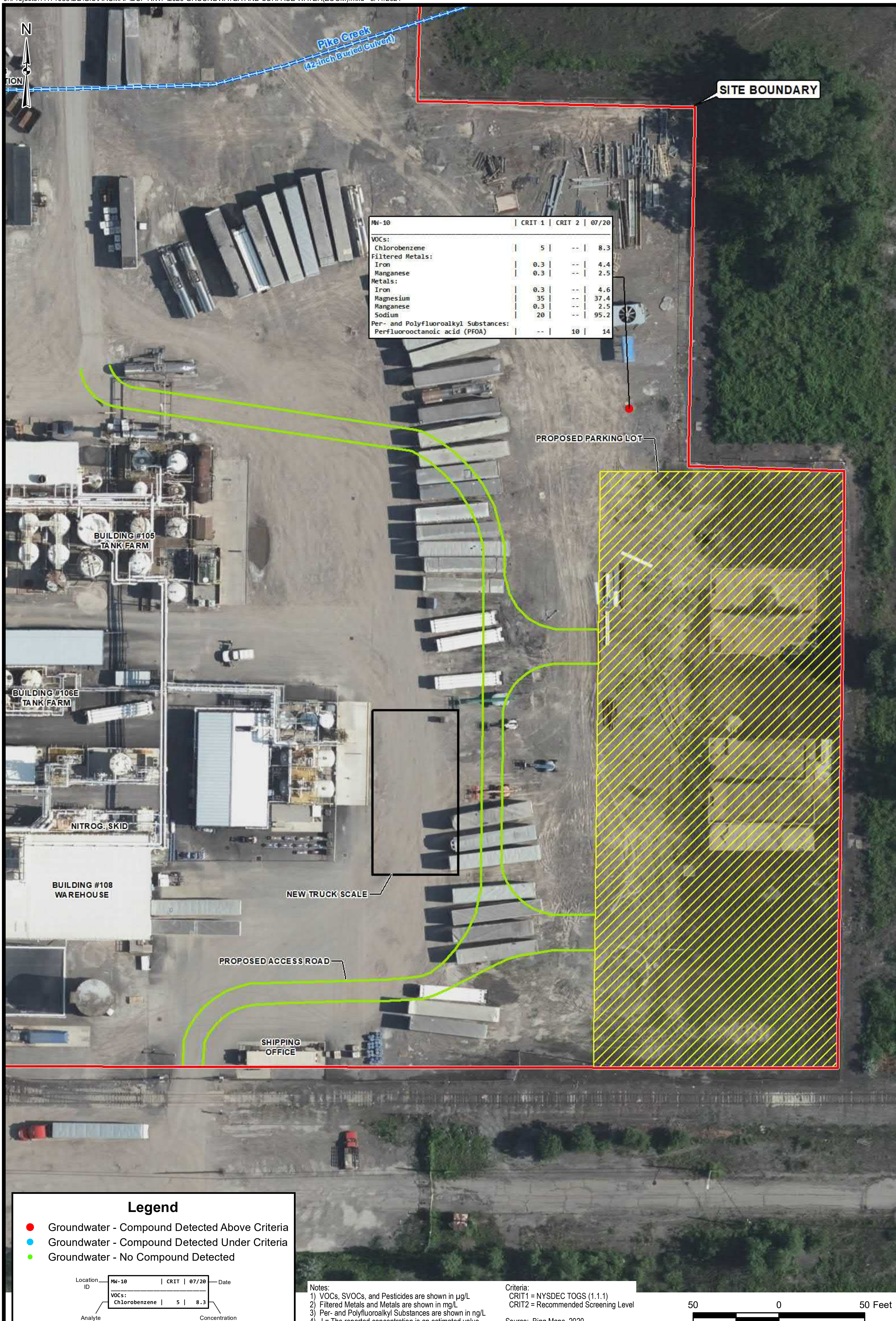
50 0 50 Feet

AECOM

UNION CARBIDE CORPORATION NIACET SITE
PHASE 1 RI SUBSURFACE SOIL ANALYTICAL RESULTS EXCEEDING CRITERIA

FIGURE 2-11

J:\Projects\11171085\DB\GIS\ARCMAP\BCP RIWP\2020 GROUNDWATER AND SURFACE WATER(ZOOM).mxd 8/11/2021



MW-10	CRIT 1	CRIT 2	07/20
VOCs:			
Chlorobenzene	5	--	8.3
Filtered Metals:			
Iron	0.3	--	4.4
Manganese	0.3	--	2.5
Metals:			
Iron	0.3	--	4.6
Magnesium	35	--	37.4
Manganese	0.3	--	2.5
Sodium	20	--	95.2
Per- and Polyfluoroalkyl Substances:			
Perfluorooctanoic acid (PFOA)	--	10	14

Legend

- Groundwater - Compound Detected Above Criteria
- Groundwater - Compound Detected Under Criteria
- Groundwater - No Compound Detected

Location ID — Date — Analyte — Concentration

MW-10	CRIT	07/20
VOCs:		
Chlorobenzene	5	8.3

Notes:
1) VOCs, SVOCs, and Pesticides are shown in µg/L
2) Filtered Metals and Metals are shown in mg/L
3) Per- and Polyfluoroalkyl Substances are shown in ng/L
4) J = The reported concentration is an estimated value.

Criteria:
CRIT1 = NYSDEC TOGS (1.1.1)
CRIT2 = Recommended Screening Level

Source: Bing Maps, 2020

AECOM

UNION CARBIDE CORPORATION NIACET SITE
PHASE 1 RI GROUNDWATER/SURFACE WATER ANALYTICAL RESULTS

FIGURE 2-12

TABLES

Table 2-1
Test Pit Observations
2013 - 2015
Niacet BCP Site
Niagara Falls, NY

Test Pit	Date	Total Depth (BGS)	Visible Hg	XRF (PPM)	Material Excavated	Comments
BLDG 6 TP-1	3/26/2013	4.2'	None	ND-323	0-1.4' fill. 1.4'-4.2' clay.	
BLDG 6 TP-2	3/26/2013	4.4'	None	ND-73	0-1.8' fill. 1.8'-4.4' clay.	Radiation levels around 27 K CPM from 1 to 1.8 ' bgs.
BLDG 6 TP-3	3/26/2013	4.1'	None	ND	0-2.0' fill. 2.0'-4.1' clay.	Radiation levels of around 60 K to 81 K CPM from 1.5 to 2 ' bgs.
TP-1	3/13/2013	1.0'	None	ND-2650	0-1' fill.	Refusal on concrete at 1.0' .
TP-2	3/13/2013	8.0'	None	ND-240	0-8' fill.	Radiation levels to 80 K counts per minute in yellow brick and ash from 2.5-8' bgs.
TP-3	3/14/2013	8.5'	1.5-3.5'	<50-7580	0-6.5' fill. 6.5-8.5' silt and clay.	
TP-4	3/14/2013	8.5'	None	<500-12,000	0-7.5' fill. 7.5-8.5' silt and clay.	
TP-5	3/14/2013	9.5'	8.5-9.5'	73-110	0-8.5' fill. 8.5-9.5' silt and clay.	
TP-6	3/15/2013	8.5'	None	ND-<200	0-7' fill. 7-8.5' silt and clay.	
TP-7	3/15/2013	9.5'	1.2-5.0'	<850-7500	0-8.5' fill. 8.5-9.5' silt and clay.	
TP-8	3/19/2013	8.5'	None	350-478	0-8.5' fill.	
TP-9	3/19/2013	8.5'	None	<200-255	0-8.5' fill.	
TP-10	3/19/2013	8.5'	1.2-7.5'	500-7350	0-7.5' fill. 7.5-8.5' silt and clay.	
TP-11	3/21/2013	8.7'	2-3.2'	110-14,000	0-5.5' fill. 5.5'-8.7' clay.	
TP-12	3/21/2013	3.5'	None	125-1012	0-3.5' fill.	Stopped excavation after radiation levels reached 20 K counts per minute.
TP-13	3/21/2013	8.5'	1.4'	52-705	0-8.5' fill.	
TP-14	3/28/2014	8'	None	50-175	0-5' fill. 5-8' silt and clay.	
TP-15	7/25/2014	11'	0 to 7'	250 - 1100	0-9.5' fill. 9.5-11' silt and clay.	
TP-16	7/28/2014	11	0.9-9.5'	380-1500	0-9.5' fill. 9.5-11' silt and clay.	12' dia. clay pipe at 5.8' bgs w/ vis Hg inside and in soil below.
TP-17	7/29/2014	11'	1.5-8.3'	450-2120	0-8.3' fill. 8.3-11' silt and clay.	12' dia. clay pipe at 5.5' bgs w/ vis Hg inside and in soil below.
TP-18	8/8/2014	11'	None	130-3678	0-9.2' fill. 9.2-11' silt and clay.	
TP-19	8/8/2014	11.5'	1-3.5, 7-9.5'	1152-10.3 K	0-9.5' fill. 9.5-11.5' silt and clay.	
TP-20	8/11/2014	11'	5-11'	300-3213	0-10' fill. 10-11' silt and clay.	
TP-21	8/11/2014	11'	2.5-11'	580-43.5 K	0-9.5' fill. 9.5-11' silt and clay.	
TP-22	10/23/2014	6'	None	ND-98	0-6' fill.	
TP-23	10/23/2014	6.5'	None	ND	0-6.5' fill.	Minor vis Hg in bell of 8" clay pipe-none in soil.
TP-24	10/24/2014	7'	None	ND-51	0-6' fill. 6-7' silt and clay.	
TP-25	10/24/2014	8.5'	2.2-8.5'	ND-4000	0-8' fill. 8-8.5' silt and clay.	Stopped digging at 8.5' due to very wet soils.
TP-26	10/24/2014	11'	2-11'	450-1900	0-11' fill.	
TP-27	10/27/2014	11.5'	4-11.5'	ND-460	0-10' fill. 10-11.5' silt and clay.	Vis Hg seen mostly on n. side of excavation.
TP-28	10/27/2014	11.5'	3-7'	ND-4500	0-8.5' fill. 8.5-11.5' silt and clay.	Test pit adjacent to north side of Pike Creek.
TP-29	10/28/2014	4.7'	4-4.7'	250-2700	0-4.7' fill.	Stopped excav. due to proximity of cooling bldg.
TP-30	10/28/2014	11.5'	None	ND-780	0-8' fill. 8-11.5' silt and clay.	
TP-31	10/29/2014	11.2'	7-10'	ND-6000	0-10' fill. 10-11.2 silt and clay.	Vegetation (reeds) seen 7-11.2'.
TP-32	10/29/2014	11.6'	None	ND	0-11.6' fill.	Excavated through former building #19A floor slab to bedrock.
TP-33	10/29/2014	7'	None	ND-1200	0-7' fill.	Excavated to 7' concrete bottom in former cooling pond.
TP-34	10/29/2014	5.3'	0.5-2'	ND-1375	0-5.'3 fill.	
TP-35	10/29/2014	4.5' on concrete	On concrete floor.	ND-211	0-4.5' fill	Several small beads on concrete floor. Believed Hg fell into excavation from surface.
TP-36	10/30/2014	5' on concrete	None	ND-105	0-5' fill. 5-8' silt and clay.	
TP-37	10/30/2014	5.8'	None	ND-142	0-4.3' fill. 4.3-5.8' silt and clay.	
TP-38	10/30/2014	6'	4-6'	ND-1200	0-6' fill.	
TP-39	10/30/2014	5.8'	4.8-5.8'	ND-6000	0-5.'8 fill.	
TP-40	10/31/2014	7.5'	None	ND	0-7' fill. 7-7.5' clay	Radiation levels to 50 K cpm from 0.9-1.4'.
TP-41	11/3/2014	7.5'	1.2-7'	100-7805	0-7' fill. 7-7.5' silt and clay.	
TP-42	11/3/2014	7'	None	ND	0-6' fill. 6-7' silt and clay.	
TP-43	11/3/2014	7.5'	None	ND-52	0-6' fill. 6-7.5' clay.	Radiation levels 50 K to 80 K cpm from 1-3'.

Table 2-1
Test Pit Observations
2013 - 2015
Niacet BCP Site
Niagara Falls, NY

Test Pit	Date	Total Depth (BGS)	Visible Hg	XRF (PPM)	Material Excavated	Comments
TP-44	11/4/2014	7'	None	ND-673	0-6' fill. 6-7' silt and clay.	
TP-45	11/4/2014	7'	1.2-1.4'	ND-1025	0-6.5' fill. 6.5-7' silt and clay.	Vis Hg in 0.2' thick gravel layer at 1.2' bgs.
TP-46	11/4/2014	4'	2.5-4.7'	ND-550	0-4.7' fill.	TP adjacent to catch basin. Vis Hg in 6" dia clay pipe from catch basin, and in soil below.
TP-47	5/26/2015	2.5'	None	ND	0-2' fill. 2-2.5' silt and clay.	
TP-48	5/26/2015	2.8'	None	ND-418	0-2' fill. 2-2.8' silt and clay.	
TP-49	5/26/2015	7'	None	ND-10'	0-1.8'. Reeds and muck.	Excavated through 1.8' of water, reeds and muck to concrete bottom of cooling pond.
TP-50	5/26/2015	7'	None	ND-22'	0-2' of water, reeds and muck.	Excavated through 2.0' of water, reeds and muck to concrete bottom of cooling pond.
TP-51	5/26/2015	7'	None	ND-13'	0-2' of water, reeds and muck.	Excavated through 2.0' of water, reeds and muck to concrete bottom of cooling pond.
TP-52	5/26/2015	9'	None	ND-185	0-9' fill.	
TP-53	5/26/2015	10'	None	ND-183	0-10' fill.	
TP-54	5/27/2015	11'	None	ND-53	0-11' fill.	Excavated through former building #19 floor slab to bedrock.
TP-55	5/27/2015	9'	None	ND-147	0-8' fill. 8-9' gray clay.	
TP-56	5/27/2015	5'	None	ND-107	0-1.5' fill. 1.5-5' silt and clay.	Stopped excavation at 5' due to very wet soil.
TP-57	12/7/2015	2'	None	ND	0-1.5' fill. 1.5- 2' silty clay.	
TP-58	12/7/2015	2'	None	ND-105	0-1.8' fill. 1.8-2' silty clay.	
TP-59	12/7/2015	3.2'	None	ND-65	0-1.8' fill. 1.8-3.2' silty clay.	
TP-60	12/15/2015	3.9'	None	ND	0-2.8' fill. 2.8-3.9' silt & clay.	
TP-61	12/14/2015	7.5'	None	ND-141	0-7.5' fill.	
TP-62	12/10/2015	4.3'	None	ND	0-2.3' fill. 2.3-4.3' silt & clay.	
TP-63	12/11/2015	4.3'	None	ND	0-4.3' fill.	Concrete slab at bottom - could not be broken by excavator.
TP-64	12/11/2015	7.5'	None	ND	0-7.5' fill.	Diesel odor 0.2-1.8'. Sheen on groundwater.
TP-65						Excavation not completed due to nearby buried gas line that could not be accurately located.
TP-66	12/7/2015	4.2'	None	ND-1104	0-3.5' fill. 3.5-4.2' clay.	Radiation levels to 60 K CPM from 0.7 to 1.5' in gray-green slag.
TP-67	12/8/2015	6.5'	None	ND-378	0-5.5' fill. 5.5-6.5' clay.	Radiation levels to 80 K CPM from 0.7 to1.5' in gray-green slag.
TP-68	12/8/2015	6.5'	0.25-0.5'	ND-5565	0-6.5' fill.	Visible Hg observed only in surface gravel from 0.25-0.5'.
TP-69	12/8/2015	10'	In 4" dia. Pipe at 4.8'.	ND-1352	0-10' fill.	Visible Hg observed only in 4" pipe. Excavation located between two concrete foundation walls.
TP-70	12/9/2015	8.6'	None	ND-124	0-6.5' fill. 6.5-8.6' silt & clay.	
TP-71	12/9/2015	10.2'	None	ND-333	0-9.2' fill. 9.2-10.2' sand, silt & clay.	
TP-72	12/9/2015	9.8'	None	ND	0-7.5' fill. 7.5-9.8' silt & clay.	
TP-73	12/15/2015	10.5'	None	ND	0-5.5' fill. 5.5-10.5' sand, silt & clay.	
TP-74	12/10/2015	13.1'	None	ND-287	0-8.1 fill. 8.1-13.1' gravel, silt & clay.	
TP-75	12/15/2015	12'	None	ND	0-2.5' fill. 2.5-12' silt & clay.	
TP-76	12/10/2015	13'	None	ND	0-6' fill. 6-13' sand, gravel, silt & clay.	

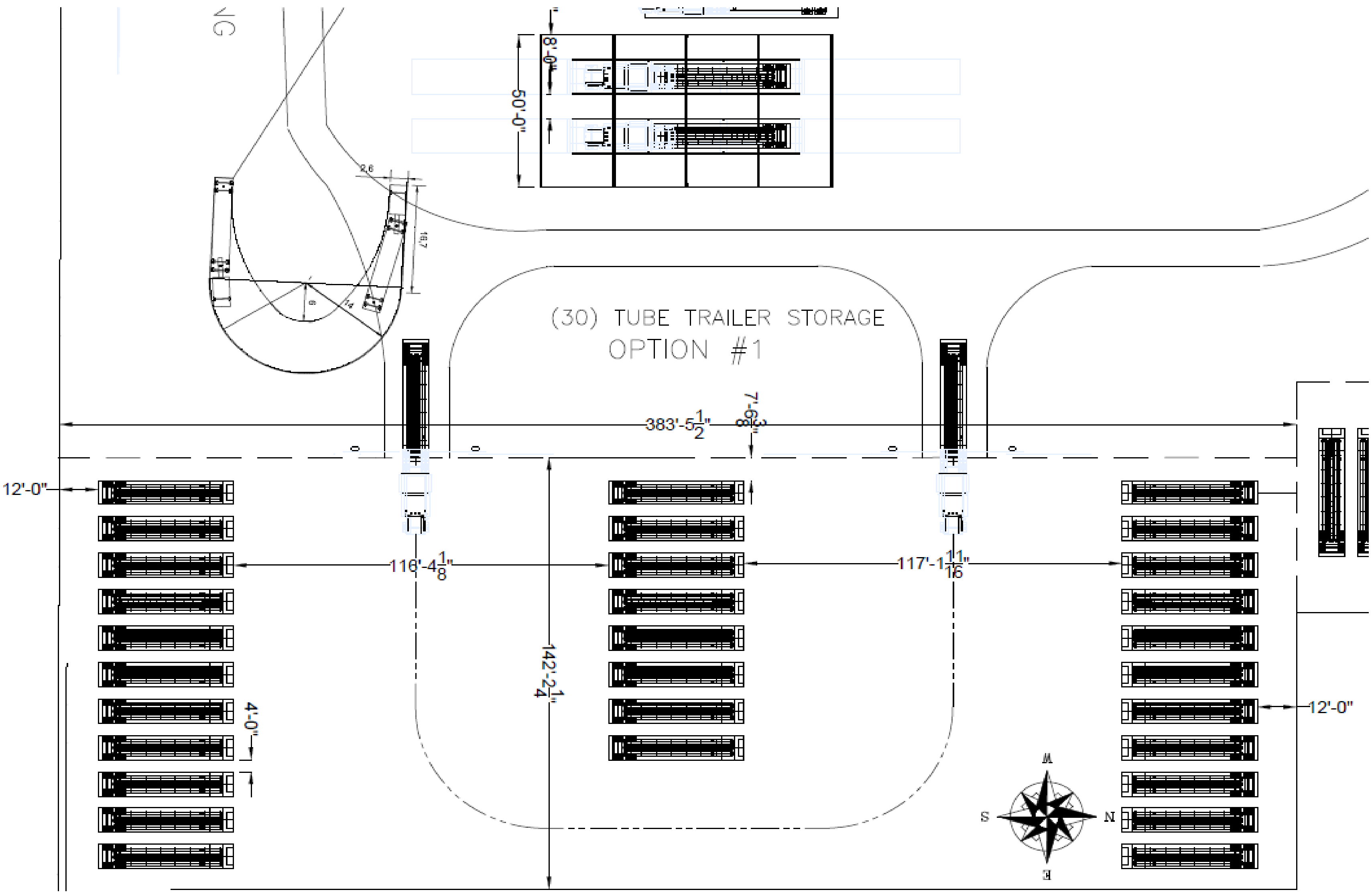
1) = Field book number/page number.
Test pits excavated to bedrock unless otherwise noted in Comments section.
Bgs = below ground surface.
CPM = counts per minute.

APPENDIX A

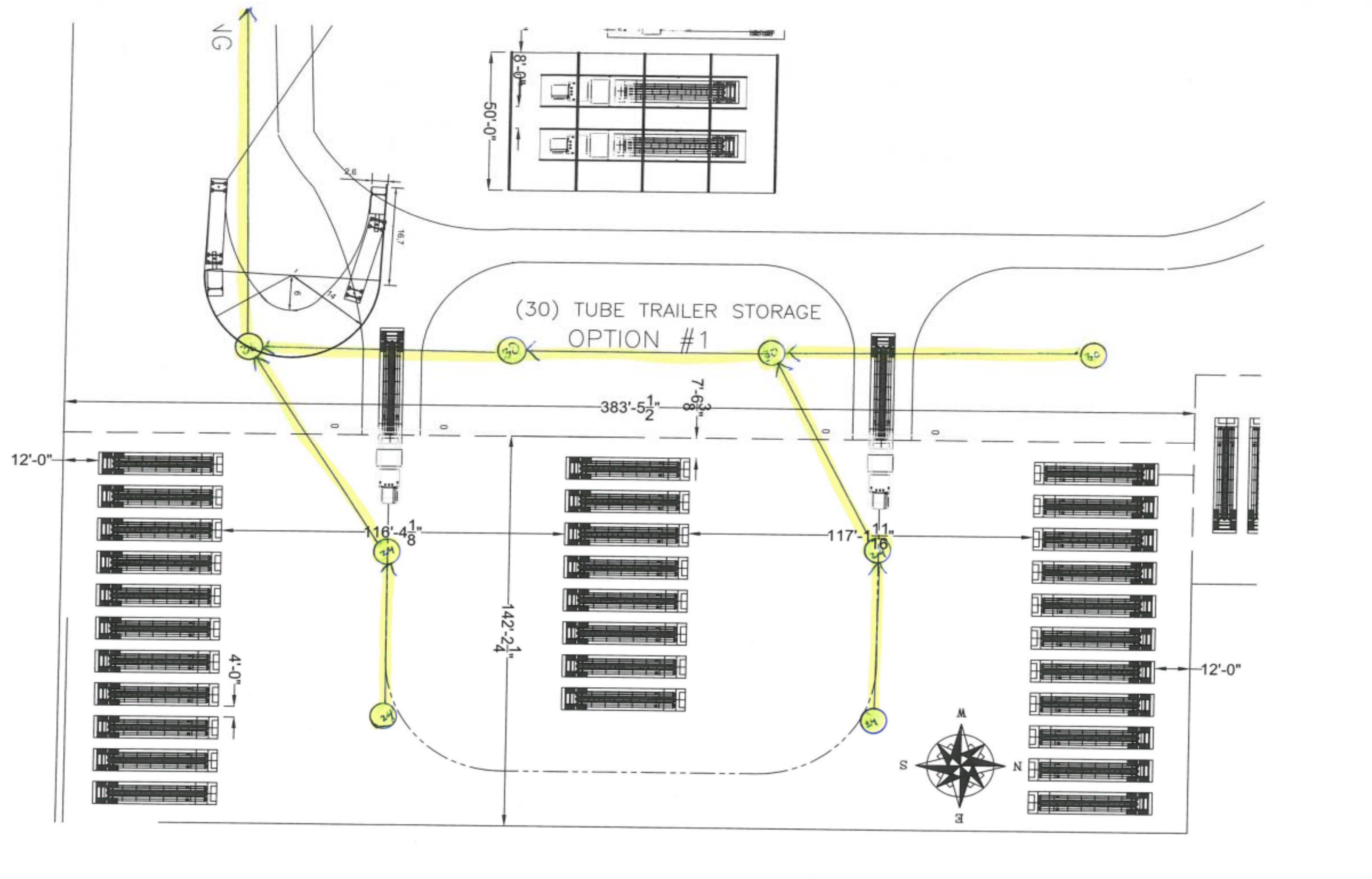
Niacet Corporation
Site Improvement Plans and Details

Parking lot and Road Work Plan

Item	Description
	Roadway
1	Excavation of 12" to 16" of current soil based on parking area drawing
2	Installation Geo Mat in excavation area with 18" lap on all seams Mat specs attached
3	Installation of #2 crush and run stone, max of 4" lifts , compaction of 2000 lbs., Stone specs attached
4	Grade of road surface will have a 2% to 3 % slope to the East
	Parking area
1	Excavation of 12" of current soil based on drawing
2	Installation Geo Mat in excavation area with 18" lap on all seams Mat specs attached
3	Installation of #2 crush and run stone, max of 4" lifts , compaction of 2000 lbs., Stone specs attached
4	Grade of parking area surface will sloped to the four catch basins in the main field of the parking area see attached drainage drawing
	Drainage/ Other items
1	Installation of 24" 30" and 36" catch basin with 8" drain lines.
2	Excavation of 12" to 48" trenches for the installation of the catch basins and drain line to retain surface water and discharge to the South main sewer
3	All trenches and catch basins with be backed filled with clean #2 crush and run at a 1500 lbs. compaction.
4	Installation of six light pole foundation 18" X 48" deep along the North, South and East sides of the parking area
5	Installation or conduit from building 114 MCC to the first pole on the Northwest corner and running the perimeter of the parking lot to the Southwest corner. This will require a 24" trench
	Notes
1	All excavated materials will remain on site in an approved area. All excavated materials must be covered until disposal and removal from the site is completed .



(30) TUBE TRAILER STORAGE
OPTION #1
50'-0"
8'-0"
383'-5 1/2"
7'-6 3/8"
12'-0"
116'-4 1/8"
117'-1 11/16"
142'-2 1/4"
4'-0"
12'-0"
W
S
N
E



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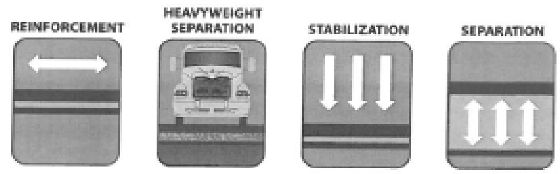
E

Construction Geosynthetics



US 4800/30

NTPEP APPROVED - GTX-2019-01-283. US 4800/30 is a woven geotextile made of 100% high-tenacity polypropylene yarns. It is a "combination" product made of monofilament yarns in the machine direction and fibrillated yarns in the cross direction. US 4800/30 resists ultraviolet and biological deterioration, rotting, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. US 4800/30 meets the following M.A.R.V. values except where noted:

Property	Test Method	English	Metric
Tensile Strength	ASTM D-4632	500 x 475 lbs	2,225 x 2,114 N
Elongation @ Break	ASTM D-4632	11 x 4%	11 x 4%
Wide Width Tensile	ASTM D-4595	4,800 x 4,800 lbs/ft	70 x 70 kN/m
Wide Width Tensile @2% Strain	ASTM D-4595	960 x 1,500 lbs/ft	14 x 21.90 kN/m
Wide Width Tensile @5% Strain	ASTM D-4595	2,400 x 3,000 lbs/ft	35 x 43.80 kN/m
Wide Width Tensile @10% Strain	ASTM D-4595	4,800 lbs/ft x -	70 kN/m x -
CBR Puncture	ASTM D-6241	2,000 lbs	8,900 N
Trapezoidal Tear	ASTM D-4533	180 x 180 lbs	801 x 801 N
Apparent Opening Size[1,2]	ASTM D-4751	30 US Sieve	0.60 mm
Permittivity[1]	ASTM D-4491	0.50 Sec^{-1}	0.50 Sec^{-1}
Water Flow Rate[1]	ASTM D-4491	30 g/min/f^2	1,222 l/min/m^2
UV Resistance @ 500 Hours	ASTM D-4355	80%	80%

Roll Size	Roll Diameter	Area	Weight
15' x 300'	15.0 in	500 sys	475 lbs

(1) At the time of manufacturing. Handling, storage, and shipping may change these properties.
(2) Maximum average roll value (MaxARV).

US Fabrics, Inc. | 3904 Virginia Avenue | Cincinnati, OH 45227
Phone: (800) 518-2290 | Fax: (513) 217-4420 | email: info@usfabrics.com

NEW YORK STATE OF OPPORTUNITY. | Department of Transportation

ANDREW M. CUOMO
Governor

MATTHEW J. DRISCOLL
Commissioner

Cathy Calhoun
Chief of Staff

January 19, 2017

Mr. Tom Biamonte
Shelby Crushed Stone, Inc.
10830 Blair Road
Medina, NY 14103

Change in Aggregate Source Status

Name: Shelby Crushed Stone, Inc.

Location: Shelby Center, NY

Source No. 4-16R

Aggregate Approved for Item 703-02

Note: Aggregate from this source is approved only for NYSDOT item 703-02

Dear Mr. Biamonte:

Aggregate from the operating location noted above is approved for item 703-02, coarse aggregate. A stockpile rejection letter was sent on 5/27/2016 stating requirements needing to be addressed, regarding the restriction of use in portland cement concrete. The requirements have been met and the restriction removed. Aggregate sources which satisfy all applicable requirements of Materials Method 29 (MM29), issued July 2007, appear on the Approved List of Sources of Fine and Coarse Aggregates. The Approved List is available on the Internet at www.dot.ny.gov by clicking on "Approved Materials List" at the bottom of the home page. The passing test number 16AR73 will appear on the next update of the Approved List.

Approval status is maintained by testing every 2 years and adherence to the requirements of MM29. Approval status may be modified if it is determined that conditions have changed. The Regional Materials Engineer may be consulted for current data concerning this or any source.

Any questions regarding these matters may be directed to the Materials Bureau, Engineering Geology Section staff at (518) 457-1038.

Sincerely,

Thomas Festa
Engineering Geology

TPF/
File: 4- 16R,RFM
cc: Jim Jordon, Region 4 Materials Engineer
Tom Kane, FE2
Don Streeter, Jim Reidy, FE1
Tasha Pritchard, Engineering Geology
Brett Dening, Geotechnical Engineering

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
MATERIALS BUREAU

COARSE AGGREGATE ANALYSIS FOR 703-02 PHYSICAL REQUIREMENTS

SOURCE #: **4- 16R** TEST #: **13AR 72** BR3a SERIAL #: **223750** SM LAB #: **13044042**

Shelby Crushed Stone, Inc.
Shelby Center, NY

On 12/09/13 results of tests on material represented by sample 223750 were evaluated

Material meets specifications for Item 703-02. Consult friction aggregate requirements for approved use.

REMARKS:

NYSDOT Sizes	No. 2	No. 1	No. 1A
10 Cycle $MgSO_4$	9.1	14.2	
25 Cycle 3% freeze -thaw	15.4	14.3	
UCVC		51	

% Non-carbonate	tr	0	Percent non-carbonate and percent insoluble residue values represent this sample only. When designing mixes, follow procedures in the appropriate Materials Method.
% Insoluble residue			
L.A. Abrasion			

Bulk Specific Gravity SSD	2.74	Gravity and Absorption values represent this sample only. They may not be appropriate for designing mixes
Bulk Specific Gravity	2.707	
Apparent Specific Gravity	2.801	
Absorption	1.2	

COMPOSITION (Size No. 2)	%
Dolomite (Med Gray)	53
Dolomite (Light Grey)	28
Dolomite (Tan)	18
Dolomite (Weathered)	tr
Red Sandstone	tr

COMPOSITION (Size No. 1)	%
Dolomite (Light Grey)	65
Dolomite (Tan)	35

ATLANTIC TESTING LABORATORIES
Albany
22 Corporate Drive
Clifton Park, NY 12065
518-383-9144 (T)
518-383-9166 (F)

TRANSMITTAL

September 13, 2013

Shelby Crushed Stone, Inc.
10830 Blair Road
Medina, New York 14103

Attn: Mr. Tom Biamonte E/Mail: tom@shelbystone.com

Re: Laboratory Analysis
Aggregate Testing
NYSDOT Stockpile
77" ISC crusher running
ATL Project No. AT1069

Dear Mr. Biamonte:

On August 23, 2013, your representative delivered one stone sample (ATL Sample No. AT1069S19) #2 Crushed Stone NYSDOT Stockpile, to our Clifton Park, New York, facility for testing. A 25-Cycle Resistance of Coarse Aggregates to Freezing and Thawing test, in accordance with NYSDOT 703-08 P,G, was performed. The laboratory test results follow:

25-Cycle Resistance of Coarse Aggregates to Freezing and Thawing
NYSDOT 703-08 P, G
Washed NYSDOT #2 Stone

ATL Sample No.	Sieve Fraction	Initial Weight (g)	Final Weight (g)	Fractional Loss (%)
AT1069S19	1" – 3/4"	1503.6	1401.3	6.8
	3/4" – 1/2"	1013.8	970.6	4.3
	Totals:	2517.4	2371.9	-----
NYSDOT Specification: <20%		Total Loss: 5.8%		

Please contact our office should you have any questions or if we may be of further service.

Respectfully,
ATLANTIC TESTING LABORATORIES, Limited

Robert E. Field
Laboratory Manager
bfield@atlantictesting.com

REF/rf

APPENDIX B

NYSDOH Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

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