NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

PROPOSED STATEMENT OF BASIS CORRECTIVE MEASURES SELECTION

Bethlehem Steel

(aka Tecumseh Redevelopment, Inc.)

OU-06 – Former Petroleum Bulk Storage Sub-Area
and
OU-07 – Coal, Coke and Ore Handling & Storage Sub-Area,
and Coke Plant & By-Products Facility Sub-Area

City of Lackawanna, Erie County

Site No. 915009

EPA ID No. NYD002134880

May 2021

PREPARED BY
DIVISION OF ENVIRONMENTAL REMEDIATION

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SECTION 1: INTRODUCTION

The New York State Department of Environmental Conservation (Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This proposed Statement of Basis (SB) identifies the proposed remedy and discusses the reasons that the remedy is being proposed. This document includes a summary of the information that can be found in the site-related reports and documents.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment. The New York State Hazardous Waste Management Program (also known as the RCRA Program) requires corrective action for releases of hazardous waste and hazardous constituents to the environment. This facility is subject to both programs, and this remedy is consistent with the remedial requirements of both programs. This proposed Statement of Basis under the RCRA program will also serve as the Proposed Remedial Action Plan under the State Superfund program. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all final remedies. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repositories:

NYSDEC Region 9 Office
270 Michigan Avenue
Buffalo, NY 14203
Call (716) 851-7220 for Appointment
Attn. Mr. Stanley Radon

Lackawanna Public Library
560 Ridge Road
Lackawanna, NY 14218
Call (716) 823-0630

- Access this Statement of Basis and other project documents online through the DECinfo Locator: https://gisservices-dev.dec.ny.gov/gis/dil/index.html?rs=915009 (Click the excavator icon , then click Document Folder Link)

A public comment period has been set for: May 5, 2021 through **June 18, 2021**

A **virtual public meeting** will be held on **May 18, 2021 at 6:00 PM** via Webex (virtual platform). The public is encouraged to participate in the virtual public meeting using the link and login information provided on the public availability website: www.bethlehemsteelcleanup.com or request a call-in number to attend via the toll-free hotline at 833-578-2019.

At the meeting, the findings of the RCRA Facility Investigation (RFI) and the Corrective Measures Study (CMS) will be presented, along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the Draft Statement of Basis.

Written comments may be sent through **June 18, 2021** to:

Stanley Radon
NYS Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, NY 14203
stanley.radon@dec.ny.gov

The Department may modify the proposed remedy based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary that will accompany the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information by Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at:
http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location – The Bethlehem Steel site, also known as Tecumseh Redevelopment, Inc. (Tecumseh), is located in an urban area along the eastern shores of Lake Erie in the City of Lackawanna, Erie County. The site is located along the west side of Route 5 in the City of Lackawanna, comprising a significant portion of the former Bethlehem Steel Corporation's Lackawanna facility and extending to the lake shore.

Site Features - The site is an irregularly shaped parcel which extends from south of Smokes Creek to the Buffalo Outer Harbor on the north side, and from the eastern shore of Lake Erie to the Gateway MetroPort Ship Canal (Ship Canal). The site consists of approximately 486 acres and comprises approximately two miles of shoreline along Lake Erie. Smokes Creek passes westward across the site where it discharges to Lake Erie. The Ship Canal, located towards the northern end of the site, extends approximately 3,000 feet southward into the site from the Buffalo Harbor. The western portion of the site was created by the placement of slag-fill materials from iron and steel making within an area that was formerly waters of Lake Erie. The site is mostly undeveloped, especially the western slag fill portion. OU-06 has one structure upon it, a former laboratory which is derelict at this time. The remainder of the OU-06 area is covered by remnant tank pads or flat to moderately undulating terrain comprised of slag fill. OU-07 encompasses the area formerly used for coal, coke and ore handling & storage, and the coke and coke gas by-products facilities. Although most of the coke batteries have been razed, the remnants of two remain in the northeast part of the OU. Much of the coke gas by-products processing infrastructure has also been removed, however a number of structures, pits, vaults, chimney stacks, cracking towers, piping, roadways and railroad tracks remain. The western half of the OU is currently used for coal storage and transloading. The eastern half of the OU is used on a limited basis for warehousing and maintenance shops. The OU-04 groundwater extraction and treatment system, including extraction wells, piping, treatment facility and infiltration galleries are located in the southeastern extent of OU-07. Cover throughout the OU consists of the structures, roadways, slag fill and sparsely vegetated (grasses, weeds and trees) spaces interspersed amongst the remnants of the Bethlehem Steel coking operations.

Current Zoning and Land Use - This site is currently zoned for industrial use and is used for slag reclamation, coal handling facilities, wood recycling facilities, and the site-specific remedial groundwater treatment systems. Renewable energy facilities have been constructed upon the site which were previously developed through the Brownfield Cleanup Program (BCP) (Site Nos. C915216 and C915217). These installations include 14 wind turbines (Steel Winds I and II) located along the Lake Erie shoreline, and two (2) large solar arrays present in the southeastern corner of the site. The majority of the land is undeveloped.

Past Use of the Site - The former Bethlehem Steel Corporation (BSC) property was used for iron, steel and coke production beginning early in the 20th century. Iron and steel-making operations ceased by the end of 1983, and by the mid-1990s, most of the steel-making facilities on the west side of Hamburg Turnpike (NYS Route 5) had been demolished although coking operations continued. In September 2001, BSC's coke oven operation was terminated. While some buildings remain, most structures have been razed. The western portion that includes approximately 2 miles of Lake Erie waterfront, consists of a considerable area of manmade land (~440 acres) where iron and steel-making slag and plant wastes were deposited.

Site Geology and Hydrogeology - The predominant site feature is the slag fill area that extends into Lake Erie. This area extends from the historic lake shore, on the east side of the MetroPort Ship Canal, an average of 1,300 feet westward, and now forms the eastern shoreline of Lake Erie. The site geology beneath the slag-fill layer consists of lake and glacial sediments overlying shale or limestone bedrock. Beneath the deposited slag-fill there is, in order of increasing depth, a sand layer with occasional peat deposits, lake clay/silt deposits, and glacial till overlying shale or limestone bedrock.

The depth to groundwater is variable and depends upon the topography and can vary in depths ranging from about ten to over 60 feet below ground surface. Groundwater generally flows toward Lake Erie, Smokes Creek, or the Ship Canal. Groundwater occurs within the fill and sand layers in the overburden and in the bedrock beneath the site.

Operable Units and Solid Waste Management Unit (SWMU) Groups - The site has been divided into Operable Units (OUs). An OU represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. A number of Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), and two Hazardous Waste Management units (HWMUs) in the Corrective Measures Study (CMS) area have been designated as OUs due to their proximity to each other, the similar composition of waste material, and/or similarity of remedy selection. To date, the following OUs have been designated for the Bethlehem Steel Site:

- OU-01 (Site-Wide Remedial Program) encompasses 44 SWMUs, nine areas of concern (AOCs), and five watercourses; Smokes Creek, Blasdell Creek, and the Gateway MetroPort Ship Canal. Several SWMUs and AOCs have been addressed

as separate OUs, such as OU-02, OU-03 and OU-04, under Department approved Interim or Expedited Corrective Measures.

- OU-02 (Independent SWMUs and AOCs) consists of SWMUs P-9 (Tar Decanter Pit), P-18A and P-18B (Blast Furnace Cold and Hot Wells respectively), P-76 (Coke Oven Gas Line), and two AOCs (B and C) within S-18 (Lime and Kish Landfill R). The Tar Decanter Pit was located near the center of the coke oven area just west of the Ship Canal. The Blast Furnace Hot and Cold Wells were located at the southwest corner of the Ship Canal. The Lime and Kish Landfill covers approximately 2 acres and is located in the northwest portion of the site. These SWMUs were found to be impacted primarily with elevated levels of benzene and lead. Waste from these SWMUs were excavated, treated, and consolidated within the OU-03 containment unit.

- OU-03 (Acid Tar Pit) is approximately six acres and consists of SWMUs S-11, S-21, S-22, and S-24 known as the Acid Tar Pit Group. S-11, S-21, and S-22 are located south of Smokes Creek in the southwestern corner of the CMS area. S-24 is located just north of Smokes Creek west of the intersection of Site BSC Highways 9 and 11. These SWMUs were found to be impacted with elevated levels of metals and various organic compounds.

- OU-04 (Coke Oven Area – Groundwater) consists of groundwater associated with an approximately 27-acre area along the western side of the Gateway MetroPort Ship Canal. OU-04 is not intended to address soil, soil vapor, or other environmental issues associated with the former Coke Oven Area. This area contains portions of the former coke oven area and SWMUs P-11 (former Benzol Plant) and P-11A (“old” former Benzol Plant). These SWMUs were found to be impacted with various organic compounds.

- OU-05 (Slag Fill Area Zone 2, The Impoundments) is approximately 74.4-acres and encompasses Slag Fill Area Zone 2 (SFA-2) with the exception of OU-03. OU-05 consists of steep slag bluffs located along the eastern shores of Lake Erie and the south shore of Smokes Creek. OU-05 is comprised of the SWMUs commonly referred to as The Impoundments (S-1, S-2, S-3, S-4, S-5, S-6, S-7/20, S-8, and S-27). OU-05 does not address groundwater. Groundwater will be addressed under OU-10.

- OU-06 (Former Petroleum Bulk Storage Sub-Area), the subject of this SB along with OU-07, is approximately 116-acres located just north of Smokes Creek and encompasses SWMUs; P-8 Waste Oil Storage Tanks; S-10 Slag Quench Area J; P-74 (A, B, C, and D) Solid Fuel Mix Storage Piles; P-75 Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar; and tar impacted slag AOC-H and AOC-I. Currently, there is no active use of OU-06.

- OU-07 (Coal/Coke/Ore Storage and Handling | Coke Plant and By-Products Processing) is approximately 178-acres located just west of the MetroPort Ship

Canal and encompasses SWMUs: P-1 North Quench Water Pit; P-2 Arctic Quench Water Pit; P-3 Central Quench Water Pit; P-4 'A' Quench Water Pit; P-5 'B' Quench Water Pit; P-6 Lime Sludge Settling Basin; P-7 Abandoned Lime Sludge Settling Basin; P-10 Contaminated Soil Near Ball Mill; P-12 Stockpile Storage Area; S-19 Murphy's Mountain Landfill; S-25 Impoundment Under North End of Coal Pile; and S-26 Fill Area Near Coke Battery No. 8. The OU-04 groundwater extraction and treatment system, including extractions wells, piping, treatment facility and infiltration galleries are located in the southeastern extent of OU-07.

- OU-08 (Slag Fill Area Zones 4 and 5 SWMU/AOC Group) is approximately 113-acres located in the northwest portion of the site along Lake Erie and encompasses nine SWMUs: S-12 Asbestos Landfill L; S-13 Tar Sludge Surface Impoundment (HWMU 1A); S-14 General Rubble Landfill N; S-15 General Rubble Landfill O; S-16 Lime Stabilized Spent Pickle Liquor (SPL) Sludge Landfill (HWMU 1B); S-17 Vacuum Carbonate Blowdown Landfill Q; S-18 Lime Dust and Kish Landfill R; S-23 Tar Pit Adjacent to Lime Stabilized SPL Sludge Landfill; and S-28 Drum Landfill. In addition, seven AOCs are also included within OU-08: AOC-A is a lead-impacted areas within SWMU S-18; AOCs-B and -C were lead-impacted areas within SWMU S-18; AOC-D is a tar-impacted area north of SWMU S-23; AOC-E was a tar-impacted area north of SWMU S-14; AOC-F was a tar-impacted area in the Iron City Slag Reclamation area; and AOC-G was a tar-impacted area at Steel Winds II Wind Turbine 9 (WT-9).

- OU-09 (Water Courses) is comprised of Lake Erie, Smokes Creek, the North Return Water Trench (NRWT), the South Return Water Trench (SRWT), and the MetroPort Ship Canal. Approximately 8,500-feet of the eastern shoreline of Lake Erie borders the Bethlehem Steel Site.

- OU-10 (Site Wide Groundwater) covers groundwater across the entire site except for the portion already addressed under the OU-04 and OU-03 groundwater extraction and treatment systems.

This proposed Statement of Basis has been prepared for OU-06 Former Petroleum Bulk Storage Sub-Area and OU-07 the Coal, Coke and Ore Handling and Storage Sub-Area, and the Coke Plant and By-Products Facility Sub-Area.

A site location and vicinity map is attached as Figure 1. A facility-wide map depicting the corrective measure study sub-areas (solid waste management units, water courses and areas of concern) is attached as Figure 2. Figure 3 is attached depicting the solid waste management units (SWMUs) and areas which compromise OU-06. Six additional figures are also attached depicting the solid waste management units (SWMUs) and areas which comprise OU-07. The figures included in this document are enumerated in the following table:

Figure Number	Area of Interest
No. 1	Site Locality and Vicinity Map
No. 2	Facility-wide CMS study areas
No. 3	OU-06 SWMUs
No. 4	OU-07 Sub-Area SWMUs P-1 thru P-6
No. 5	OU-07 Sub-Area SWMUs P-7, P-9 and P-10
No. 6	OU-07 Sub-Area SWMUs P-11, P-11A and P-12
No. 7	OU-07 Sub-Area SWMUs P-18A and P-18B
No. 8	OU-07 Sub-Area SWMUs S-19 and S-25
No. 9	OU-07 Sub-Area SWMU S-26

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For these Operable Units, alternatives which allow for industrial use of the OU are proposed.

SECTION 5: ENFORCEMENT STATUS

The Bethlehem Steel site is subject to hazardous waste treatment, storage, and disposal facility (TSDF) permitting requirements under New York State (NYS) hazardous waste regulations (6 NYCRR Part 373) and has RCRA EPA ID No. NYD002134880. Under this regulatory program, Tecumseh is responsible for implementing Corrective Action to address releases to the environment from solid waste management units (SWMUs) and areas of concern (e.g., watercourses). On June 30, 2009 the Department and Tecumseh signed an Order on Consent (the "Order") to complete a Corrective Measures Study (CMS) for the facility. On September 24, 2020 the Department and Tecumseh signed an Order on Consent (the "Order") to complete comprehensive investigation; evaluation; and implementation of Corrective Measures/Remedial Actions, Closure and Post-Closure Care requirements of the site, to protect public health and the environment and to allow, when and where appropriate, the continued use of the site and its redevelopment by Tecumseh and/or third parties. Respondents' outstanding and on-going substantive remediation obligations and/or financial assurance obligations under previous Orders, agreements, and authorizations survive and shall be binding and enforceable under this Order.

The property is also a site listed on the Department's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 915009- Bethlehem Steel) and is currently classified as a Class 2 site as defined in the associated 6NYCRR Part 375 regulations (significant threat to the public health or environment - action required). The proposed Statement of Basis will serve as the Proposed Remedial Action Plan. Portions of the former Bethlehem Steel property are also participating in the Brownfield Cleanup Program administered by the Department.

SECTION 6: SITE CONTAMINATION

6.1 Summary of the Site Investigation

A site investigation serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to public health and the environment.

A RCRA Facility Investigation (RFI) was initiated by Bethlehem Steel in 1990 and subsequently completed by Tecumseh in October 2004 (URS 2004). The investigation was intended to identify the nature (or type) of contamination which may be present at the site and the extent of that contamination in the environment on the site or leaving the site. The investigation reports on data gathered to determine if wastes containing hazardous substances were disposed at the site, and if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. The RFI investigated conditions on approximately 1,600 acres of former Bethlehem Steel property. Based on the RFI results, areas of the former Bethlehem Steel property were identified as needing remediation or further assessment. Sub-areas of the original 1,600-acre site were identified based on the historic use or disposal practice that took place in each area. A number of these sub-areas have yet to be remediated and are the subject of this and other SBs. Other sub-areas have been remediated and repurposed through programs such as the BCP for the alternative energy projects previously mentioned. Further investigation and assessment of remedial alternatives was performed by Tecumseh in a Corrective Measures Study (CMS) Report (TK-BM 2011; revised 2014 and 2019). A supplemental Comprehensive Groundwater Quality Report (TK-BM 2014; revised 2019) was also prepared that summarized and assessed the groundwater data collected during both the RFI and CMS. Data is also available from semiannual (2006-2008) and annual (2009-2019) groundwater monitoring events performed at HWMUs 1A and 1B. Investigation reports are available for review in the site document repository and pertinent results are summarized in **Exhibit A**.

The analytical data collected for OU-06 and OU-07 was derived from samples of:

- soil/fill/waste material contained in SWMUs
- surface/impounded water contained in SWMUs (OU-07 only)

6.1.1 Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the site investigations were compared to media specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibits A and B list the applicable SCGs. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2 Investigation Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the site investigation reports contain a full discussion of the data. For OU-06 data are available from the slag fill and solids. In OU-07, data are available from two primary media sources; the standing water and the residual or accumulated solids which are contained in the pits and vaults lying throughout the area of the former coke batteries and coke gas by-products facilities. It is believed that, within OU-07, solids remain in the bottom of the pits and vaults which were not cleaned out after Bethlehem Steel's operations ceased. The residual solids, left from the coking processes and other operations, have been found to be impacted which in turn impact the accumulated precipitation which is retained or impounded in the vaults, pits and subgrade structures. Fuel oil(s) have been identified as free products in OU-06. The contaminants which have been identified in OU-06 and OU-07 exceeding the respective SCGs are:

Soil/Residual Solids

Acetone,
Benzene,
Ethylbenzene,
Methylene Chloride,
Toluene,
Xylenes (Total),
Acenaphthene,
Acenaphthylene,
Anthracene,
Benzo(a)anthracene,
Benzo(a)pyrene,
Benzo(b)fluoranthene,
Benzo(ghi)perylene,
Benzo(k)Fluoranthene,
Chrysene,
Dibenz(a,h)anthracene,
Dibenzofuran,
Fluoranthene,
Fluorene,
Indeno(1,2,3-cd)pyrene,
3-Methylphenol and 4-Methylphenol,
2-Methylphenol,
Naphthalene,
Phenanthrene,
Phenol,
Pyrene,
PAHs(Total),
Arsenic,
Cadmium,
Mercury,
Nickel,
Selenium,
and Silver.

Surface/Impounded Water

Benzene,
Ethylbenzene,
Toluene,
Xylenes (Total),
Fluorene,
Naphthalene,
Phenanthrene,
Phenol,
Mercury (Total),
Mercury (Dissolved),
and Cyanide.

The contaminant(s) of concern exceed the applicable SCGs for:

- soil/fill/waste material
- surface/impounded water

6.2 Interim and Final Corrective Measures

Interim Corrective Measures (ICMs) are taken if, at any time during an investigation, it becomes apparent that corrective actions should be taken to immediately address the spread of contamination. The intent is to construct an ICM as close as possible to a component of a permanent system or final remedy.

6.2.1 Interim Corrective Measures

The Department has determined that the following ICMs are protective to human health and the environment and should serve as part of the Final Corrective Measures at the facility.

The following ICMs have been completed with OU-06 and OU-07 based on conditions observed during the RFI:

OU-06

SWMU S-24 An Interim Corrective Measure (ICM) was performed to remove, transport, and consolidate waste from SWMU S-24 within the combined footprint of SWMUs S-11 & S-22 (OU-5 Agitator Sludge Area) and to construct a containment cell surrounding the consolidated waste deposition area. The total in-place volume of waste/fill material excavated from SWMU S-24 was approximately 24,500 cubic yards. A revised construction completion report (CCR) for this work was submitted to the Department in February 2013

OU-01C An ICM was performed to remove a five-million-gallon storage tank in the former petroleum storage area, OU-06, that was used to store approximately 350,000 gallons of wastewater generated from various plant decommissioning activities. The wastewater was sent to the wastewater treatment facility at the Galvanizing Plant on the east side of NYS Route 5. The scrap metal was sent off-site for recycling. Approximately 87 tons of solid waste was removed and sent off-site for disposal. In a letter dated February 14, 2011, the Department confirmed that Tecumseh had satisfied the terms of the Order on Consent that required the treatment and discharge of wastewater and residual solids from the storage tank, and ultimately accepted the demolition and removal of the tank from Tecumseh's property, terminating Tecumseh’s obligations under the Order.

OU-07

OU-04A This ICM was a groundwater and NAPL pump and treat system installed in the Benzol Yard (SWMU P-11), located in the Coke Oven Area, near the south end of the Ship Canal. The system included multiple extraction wells, NAPL separation, air stripping

of groundwater, and reinjection of treated water. This system began operating in 2005. A thermal oxidizer was initially used to treat vapor discharge from air stripper, but oxidizer use was discontinued due the reduced loading into the system. Between 2005 and 2018, this interim measure reportedly removed and destroyed over 36,000 pounds of contaminants. In 2019, the treatment building was dismantled, and the extraction wells and treatment system were incorporated into the final OU-04 groundwater remedy.

OU-04B An ICM was performed to address source material located in the unsaturated soils and "smear zone" in the vicinity of SWMU P-11, also known as the Benzol Yard Source Control. A soil vapor extraction system was installed to collect and treat VOCs in 2019. The ICM will be managed in conjunction with the OU-04 remedy. Annual operation, maintenance and monitoring reports are submitted to the Department for review and evaluation. As of April 2020, this interim measure had recovered approximately 351 pounds of VOCs. A revised CCR was submitted on October 24, 2019 and approved by the Department on November 12, 2019.

6.2.2 Final Corrective Measures

Final corrective measures have been implemented or completed within OU-07, as detailed below. No Final Corrective Measures have been implemented within OU-06.

OU-02 This OU and the June 2015 Statement of Basis addressed SWMUs P-9 (Tar Decanter Pit), P-18A & P-18B (Blast Furnace Hot & Cold Wells) and two AOCs (B & C) within S-18 (Lime and Kish Landfill R). SWMUs P-9 and P-18 A/B are located within the boundary of OU-07, the subject of this SB. The AOCs located in S-18 are located outside of the OU-07 bounds and not subject to this discussion. The SWMUs within OU-07 were found to be impacted primarily with elevated levels of benzene and lead. Wastes from these SWMUs were excavated, treated, and consolidated within the OU-03 containment unit. A revised CCR for OU-02 & OU-03 was submitted on July 26, 2016 and approved by the Department on August 12, 2016.

OU-04 The March 2017 OU-04 Statement of Basis addresses groundwater associated with an approximately 27-acre area along the western side of the Gateway MetroPort Ship Canal. OU-04 is not intended to address soil, soil vapor, or other environmental issues associated with the former Coke Oven Area but lies within the bounds of OU-07. These other media will be addressed by the remedies selected for OU-07. The OU-04 area contains portions of the former coke oven area and SWMUs P-11 (former Benzol Plant) and P-11A ("old" former Benzol Plant). The Benzol Plants were used for the treatment and processing of liquid coke gas by-products. These SWMUs were found to be impacted with various organic compounds.

A Consent Order for Coke Oven Area Groundwater Corrective Action (File No. 16-55) was executed in September 2017 calling for augmenting the existing 11 ICM groundwater pumping wells in the Benzol Yard (SWMU P-11) with an additional 14 pumping wells plus an additional 27 pumping wells in the northern portion of the OU-4 Area in and around the "Old" Benzol Yard (SWWU P-11A). The existing Benzol Yard ICM groundwater

treatment system and south infiltration gallery (i.e., OU-04A) was decommissioned following construction and start-up of the new OU-04 groundwater treatment system in March 2019. The OU-04 groundwater treatment building contains two parallel treatment systems or “trains” with the south groundwater treatment train consisting of an oil-water separator, bag filtration, and shallow tray air stripper; and an independent northern groundwater treatment train with a bag filter, a shallow tray air stripper, and a granular activated carbon adsorption system to treat the higher phenolic and naphthalene constituent concentrations. Treated groundwater is discharged back to the subsurface through infiltration galleries located adjacent to the treatment building in the west central portion of the OU. An amended CCR was submitted on August 13, 2019 and approved by the Department on September 11, 2019.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptor, and groundwater resources.

The corrective action process began with evaluations and investigations to identify potential areas of the site that may have been impacted by hazardous wastes and/or hazardous constituents. Based on the results of numerous phases of investigations, the Department has determined that hazardous substances are present in the material disposed at the site, specifically OU-06 and OU-07. The nature of these materials was characterized and evaluated to identify contaminants of concern, migration potential, engineering properties and stabilization options.

Environmental assessments and investigations have focused on the SWMU material, soil, and groundwater associated with OU-6. A brief summary of these assessments and investigations of OU-6 is included in **Exhibit A**. Evaluation of other environmental media and surrounding areas will be addressed through separate remedy selection actions.

The environmental assessments and investigations of OU-07 have evaluated soil/residual solids and surface water contained in SWMUs. A summary of the OU-07 assessments and investigations is included in **Exhibit A**. The findings of the OU-07 investigations indicate the presence of hazardous constituents in soil/residual solids and surface water/impounded water, and observations of potentially grossly contaminated soil. Evaluation of other environmental media and surrounding areas will be addressed through additional remedy-selected actions.

Special Resources Impacted/Threatened:

No Special Resources are known to exist within OU-06 or OU-07.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways - breathing, touching or swallowing. This is referred to as exposure.

The site is partially fenced, gated and has signage, which restricts public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. There are several surface water areas where persons may come in contact with contaminants on-site. People are not coming into contact with the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is undeveloped or used for outdoor industrial purposes the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process in 6 NYCRR Parts 373 and 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for OU-06 are:

<u>Soil</u>

RAOs for Public Health Protection

- Prevent ingestion or direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater, surface water or sediment contamination.

The Remedial Action Objectives (RAOs) for the OU-07 area are:

<u>Soil/Residual Solids in Pits</u>

RAOs for Public Health Protection

- Prevent the ingestion and/or direct contact with contaminated soil.

- Prevent the inhalation of, or exposure from contaminants, volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Surface/Impounded Water in Pits and Subgrade Structures

RAOs for Public Health Protection

- Prevent contact with, or inhalation of contaminants from impacted water bodies.

RAOs for Environmental Protection

- Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.

SECTION 7: SUMMARY OF THE PROPOSED OU-6 and OU-07 REMEDIES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. The criteria that will be used to determine if the remedial action objectives are being achieved are presented in Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the Corrective Measures Study (CMS) report and further evaluated by the Department in the development of this proposed remedy.

A summary of the remedial alternatives that were considered for OU-6 and OU-07 is presented in Exhibit C. Where applicable, cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Corrective Measure Alternative Costs is included as Exhibit D.

The basis for the Department's proposed Corrective Measure is set forth in Exhibit E.

The proposed remedies are referred to as Building Demolition, Excavation and Site Cover and include:

OU-06

SWMU	Proposed Remedy
P-8, P-74, P-75	Demolition to grade of any current buildings (excluding slabs and/or foundations), excavation/consolidation or excavation/off-site disposal of impacted soils.
S-10	Cover in place with material meeting industrial cover requirements.

OU-07

SWMU	Proposed Remedy
P-01, P-02, P-03, P-04, P-05, P-06	Residual solids removal and backfill to grade with material meeting industrial cover requirements.
P-07, P-10, S-26	Characterization, excavation and disposal of materials followed by backfill to grade with material meeting industrial cover requirements.
P-11, P-11A, P-12, S-25	Characterization, excavation (as informed by the Pre-Design Investigation) and disposal of materials followed by backfill to grade with material meeting industrial cover requirements including a vegetated soil cover.
S-19	Regrading of existing materials to achieve a natural topography and meeting the industrial cover requirements.

The estimated present worth cost to implement the proposed corrective measures is $17,469,600. The cost to construct the proposed corrective measures is estimated to be $17,098,100 and the estimated average annual cost is $12,500. The present value of the annual cost is estimated to be $371,500.

The elements of the proposed OU-6 and OU-07 Corrective Measures are as follows:

1. Remedial Design Program

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, proposed designs shall incorporate green remediation principles and techniques to the extent feasible in the future development at this site. Any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane, or Department-approved equivalent, on the foundation to improve energy efficiency and mitigate vapor intrusion as an element of construction.

The remedial design program must also consider climate resiliency, to be incorporated into the site wide Climate Resiliency Plan, which includes:

- Climate change vulnerability analyses and adaptation planning leading to increased remedy resilience;
- Identifying potential hazards posed by climate change;
- Characterizing the remedy exposure to those hazards;
- Characterizing the remedy sensitivity to the hazards;
- Considering factors that may exacerbate remedy exposure and sensitivity, identifying measures that potentially apply to the vulnerabilities in a range of weather/climate scenarios; and;
- Selecting and implementing priority adaptation measures for the given remedy.

2. Pre-Design Investigation

A pre-design investigation (PDI) will be implemented to fill data gaps and inform the OU-06 and OU-07 remedial designs. The PDI will provide information on SWMUs and AOCs requiring additional investigation (e.g., SWMU-25) to complete the remedial design and implement a remedial action protective of human health and the environment. A PDI Work Plan will be developed for each OU, and approved by the Department, to ensure that adequate information is available to complete the remedial designs. The PDI will include, but is not limited to, the following elements:

- Additional soil sampling, in accordance with remedy Element 7, to determine the extent of areas within OU-06 and OU-07 where the upper one foot of exposed surface soil exceeds industrial soil cleanup objectives, respectively, and a site cover may be needed to allow for industrial use of the site;
- Geotechnical sampling to provide the details necessary to inform the remedial design;
- Surveying, including the location of any additional soil sampling, appropriate to support the remedial design and implementation of the remedy;
- Pre-design investigations will be performed prior to any demolition activities to identify and quantify the presence of asbestos, lead-based paint, PCBs or other hazardous/regulated materials in order to inform the demolition design;

- Exploratory investigations (e.g., test pits/trenches or borings) will be performed to determine the presence of grossly contaminated materials; and
- The investigation of SWMUs P-07, P-10, S-25 and S-26.

3. Demolition

The former facility buildings, structures and associated appurtenances will be razed to ground level. Prior to demolition, structures and components will be appropriately characterized to identify lead based paint, asbestos, PCBs, hazardous materials, etc. to determine the appropriate disposal location - either off-site or in the on-site SW-CAMU discussed in the Statement of Basis for OU-1 (Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater). Dust suppression will be utilized to control fugitive dust emissions, dust suppression fluid and storm water run-off control measures will be employed to minimize any short-term impacts from demolition activities. A comprehensive Community Air Monitoring Program (CAMP) will be developed and implemented during demolition activities. Hazardous soil and building materials will be sent to a RCRA-regulated facility for disposal. Pits, vaults and subgrade structures known or discovered during demolition activities will be cleaned and their bottoms broken and backfilled with Department-approved fill. Contractors responsible for demolition activities will be required to obtain a demolition permit, and any other applicable permits required, from the City of Lackawanna.

4. Excavation

Excavation and appropriate solidification/stabilization and/or off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria;
- concentrated solid or semi-solid hazardous substances per 6 NYCRR Part 375-1.2(au) (1);
- soil with visual waste material or non-aqueous phase liquids;
- excavation and removal of any underground storage tanks, fuel dispensers, underground piping or other structures associated with a source of contamination;
- soil containing arsenic exceeding 16 ppm or total SVOCs exceeding 500 ppm;
- soils which exceed the protection of groundwater soil cleanup objectives, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards;
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G; and
- soils which exceed the Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use (ISCO), as defined by 6 NYCRR Part 375-6.8 present within one foot of finished grade.

Approximately 76,300 cubic yards of contaminated materials will be excavated from the operable units. In addition to the anticipated volume of soil, a significant volume of soil may require to be removed if it is found to be grossly contaminated during the Pre-Design Investigation.

Solidification and/or stabilization will be implemented as necessary to treat excavated soils and residuals in contravention of the criteria listed above. Solidification and stabilization are processes that mix amendments with contaminated soil to physically and/or chemically modify the material to allow it to meet remedial goals, allowing it to be placed back on-site or hauled to an appropriate disposal facility. Under these processes the contaminated soil will be excavated and mixed in a temporary mixing facility (e.g., a pug mill) with solidifying and/or stabilizing agents such as Portland cement or Phosphate-based binders to address leachability of the contaminants from soils. The treated soil will then either be graded and covered with a cover system as described in Element 7 - Cover System, to prevent direct exposure, or alternatively, the treated soils may be disposed of at an appropriately permitted facility and the area backfilled and covered with a system meeting Industrial standards.

5. Disposition of Excavated Material

The excavated materials will be subject to a site-wide materials management plan meeting the requirements in Statement of Basis for OU-1 (Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater).

The excavated material may be:

a. sent off-site for disposal if it is found to be hazardous waste pursuant to NYCRR Part 371;
b. if determined to be non-hazardous, the off-site disposal option will allow for the staging of material on-site (for up to 24 months) in accordance with 6NYCRR Part 373-2.19(d) and 40 CFR Section 264.5 and other applicable requirements to maximize the beneficial reuse of the remedial waste as daily cover at commercial landfills, provided the remedy selection authorizes such activity. If utilized, temporary soil pile(s) may not exceed 28 feet in height; and/or
c. placed in a CAMU to be constructed on the former Bethlehem Steel site property designed to meet all applicable rules and regulations, or if approved by DEC, staged while the CAMU is being constructed. To utilize a CAMU, a design must be completed and approved, and construction must begin within 24 months of this SB (or such other time frame as the DEC agrees upon in writing) and be completed in accordance with a Department-approved schedule. If the CAMU is not constructed in accordance with the approved schedule the remedial wastes will be disposed of off-site in accordance with (a) above.

While the method of transportation will be determined during the remedial design, the Department’s preferred mode of transportation is rail since it reduces truck traffic, reduces

greenhouse gases, utilizes rail facilities located on or near the site, and is consistent with previously received community comments.

6. Backfill

A. On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy Element 7 - Cover System, to backfill the excavation to the extent that a sufficient volume of on-site soil is available to and establish the designed grades at the site.

B. On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used anywhere beneath the cover system, including below the water table, to backfill the excavation or re-grade the site.

C. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be imported to replace any excavated soil and to establish the designed grades at the site, if sufficient material meeting the above criteria is not present at the site.

D. The site will be re-graded to accommodate installation of a cover system as described in remedy element 7 - Cover System.

7. Cover System

A cover system will be required meeting the requirements of industrial use, where the upper one foot of exposed surface soil will exceed the industrial soil cleanup objectives (SCOs). The site cover will be integrated into the site wide cover required in Statement of Basis for OU-1 Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater. Where a cover system is to be used, it will be a minimum of one foot of soil, with the upper six inches of soil of sufficient quality to maintain vegetative growth, or an approved fill placed over a demarcation layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials in lieu of soil and vegetative cover may be allowed where such surfaces already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, new building foundations and associated building slabs. To the extent practical, areas with one foot of cover will enhance habitat or be appropriately regraded to facilitate future use.

8. All Other Areas

For areas of the Operable Units not previously investigated or lying outside of defined SWMUs, development and implementation of a sampling program will be required. This sampling program will be implemented to confirm the existence or adequacy of the site cover described above, or to identify source materials or grossly contaminated materials requiring removal under remedial element four.

9. Financial Assurance

Tecumseh Redevelopment, Inc., will post financial assurance using one or more of the financial instruments specified in 6 NYCRR 373-2.8 in the amount of the cost projection for the remedy selected in the Statement of Basis. This will supplement the financial assurance for all site-wide remedial activities, closure and post-closure care for the site that have not been implemented.

10. Institutional Control

Imposition of an institutional control in the form of a site-wide environmental easement for the controlled property as required in Statement of Basis for OU-1 (Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater), which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

11. Site Management Plan

Supplemental elements will be added to the site-wide Site Management Plan as required in Statement of Basis for OU-1 to address requirements of OU-06 and OU-07, including the following:

1. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls: the controls described in remedial element 8, - Financial Assurance and element 9. - Institutional Controls (Environmental Easement).

   Engineering Controls: the cover system as described in remedial element seven.

   This plan includes, but may not be limited to:

   - an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
   - a provision for further investigation and remediation should redevelopment occur or if the subsurface is otherwise made accessible. The nature and

extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the OU, or part thereof, including removal and/or treatment of any source areas. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment.

- descriptions of the provisions of the site-wide environmental easement including any land use, groundwater and surface water use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should a building foundation or building slab, acting as cover, be removed in the future, a cover system consistent with that described in remedial element seven will be placed in any area(s) where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs)
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

    - monitoring of soil and groundwater to assess the performance and effectiveness of the remedy;
    - a schedule of monitoring and frequency of submittals to the Department;
    - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

3. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

    - procedures for operating and maintaining the remedy;
    - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
    - maintaining site access controls and Department notification; and
    - providing the Department access to the site and O&M records.

PROPOSED STATEMENT OF BASIS

Exhibits A through E

Bethlehem Steel
(Tecumseh Redevelopment, Inc.)

OU-06 - Former Petroleum Bulk Storage Sub-Area
and
OU-07 - Coal, Coke and Ore Handling and Storage Sub-Area, and
Coke Plant and By-Products Facility Sub-Area

City of Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880

Exhibit A – NATURE AND EXTENT OF CONTAMINATION

Exhibit B – SUMMARY OF THE CLEANUP OBJECTIVES

Exhibit C – DESCRIPTION OF CORRECTIVE MEASURES ALTERNATIVES

Exhibit D – PROPOSED CORRECTIVE MEASURES ALTERNATIVES COSTS

Exhibit E – SUMMARY OF THE PROPOSED FINAL CORRECTIVE MEASURES

Appendix A – ADMINISTRATIVE RECORD

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) for environmental media that were evaluated for OU-06 and OU-07. As described in Section 6, samples were collected from various environmental media to characterize the nature and extent of contamination. Additional characterization will be performed to find and delineate grossly impacted soils throughout the OUs.

For each media sampled, a table summarizes the findings of the available investigation-derived data. The tables present the range of contamination found in the OU in the respective media and compares the data with the applicable Standards, Criteria and Guidance (SCGs). The contaminants generally fall within three categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for industrial use, which is the reasonably anticipated future use for the property within OU-06 and OU-07. This area has been codified “Heavy Industrial” by local City of Lackawanna Zoning Ordinance and a site-wide deed restriction exists limiting use of the site to industrial use(s). Protection of groundwater soil cleanup objectives (SCOs) are also presented for soil since soil contamination may impact groundwater.

SWMU(s)

A SWMU includes any discernible unit at which solid wastes have been placed at any time, regardless of whether the unit was intended for the management of hazardous or solid wastes. Such units include any area at the facility where solid wastes have been routinely and systematically released. Solid wastes are defined in 6 NYCRR Part 371.1(c) and hazardous wastes are defined in 6 NYCRR Part 371.1(d).

During the RFI and CMS, surface and subsurface soil and fill samples were collected between 1994 and 2011 to evaluate the nature and extent of soil contamination at many of the OU-06 and OU-07 SWMUs/AOCs. Surface soil samples were collected to assess direct human exposure. Subsurface soil samples were collected from varying depths to assess soil contamination impacts to groundwater.

As described in the RFI report, six SWMUs were identified within OU-06 and 17 SWMUs were identified within the OU-07 area. The SWMUs identified and investigated are described below and depicted in Figure 2. Past disposal and industrial practices at the facility are impacting soil/residual solids, surface/impounded water, and possibly soil vapor within OU-07. There are currently numerous buildings and structures located within OU-07 in various states of disrepair and potentially undisclosed use. Therefore, evaluation and mitigation of soil vapor impacts in accordance with the requirements in the Statement of Basis for OU-1 (Site Wide Remedial Elements, OU-9 Water Courses and OU-10 Site-Wide Groundwater) will be deferred until buildings are identified for reuse or are newly constructed.

OU-06

Tank Farm SWMU Sub-Area P-08, P-74, and P-75

As depicted on Figure 3, the Tank Farm SWMU Group Sub-Area consists of SWMUs P-8 (Waste Oil Storage Tanks), P-74 (Solid Fuel Mix Storage Piles A, B, C, and D), and P-75 (Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar). The former waste oil storage tanks (P-8) and waste piles (P-74) were removed by Bethlehem Steel Corp. (BSC) or more recently by Tecumseh as Interim Corrective Measures. This SWMU Group occupies a total of approximately 18.6 acres and contains petroleum residuals (primarily No. 6 fuel oil) in slag/fill. The slag deposited throughout the SWMU Group appears to have been placed in molten form based on the massive nature of the slag layers and the difficulty of excavation. PAHs are the primary compounds that exceed Soil Clean-up Objectives (SCOs) and the Commissioner's Policy - 51 (CP-51) total PAH concentration of 500 parts per million (ppm) in surface and subsurface slag/fill in all three SWMUs. Mercury concentrations exceeded the SCOs in five of the 28 slag/fill samples tested (one subsurface and four surface samples). Benzene did not exceed its SCO in any slag/fill samples, although several locations exceeded the Protection of Groundwater Soil Clean-up Objective. One slag/fill sample from the RFI (P75-B01; 4-6') exhibited hazardous waste characteristics for benzene (TCLP of 0.69 parts per billion, or ppb); however, two CMS slag/fill samples (i.e., P75-TP-53; 1-4 fbgs and 4-6 fbgs) from the same Sub-Area and depth were tested and did not exhibit hazardous waste characteristics for benzene.

SWMU S-10

A sparsely vegetated, 2.36-acre former slag quench pit excavated into the surrounding slag/fill measuring approximately 525 feet long, 225 feet wide, and five to 20 feet deep. The walls of this SWMU are nearly vertical except the northern end, which is a vehicle access ramp leading to the base of the depression. Benzo(a)pyrene was detected in one surface soil/fill sample at a concentration (1.4 ppm) slightly above the SCO (1.1 ppm). The contaminants in the waste ammonia liquor (WAL) and Benzol Plant process water previously used to quench molten slag at this SWMU have been detected in groundwater monitoring wells downgradient of SWMU S-10.

OU-07

Quench Pit SWMU Sub-group P-01 thru P-06

The following SWMU Group is depicted on Figure 4 - Coke Plant Sub-Area.

SWMU P-1 is an open-topped concrete vault approximately 75 feet long by 14 feet wide by 8 feet deep. The reinforced concrete walls of P-1 are 18 inches thick. The top of the pit walls are approximately 3 .5 feet above the surrounding grade. SWMU P-1 collected the Coke Oven Battery No. 7 Quench Water, settled coke fines and recirculated water

back into the quench tower. Approximately 60,000 gallons of impounded water and approximately 105 CY of solid residuals are contained within this SWMU.

SWMU P-2 is an open-topped concrete vault approximately 72 feet long by 16.5 feet wide by 10 feet deep. The reinforced concrete walls of P-2 are 12 inches thick. The top of the pit walls are approximately 3.5 feet above surrounding grade. SWMU P-2 collected the Coke Oven Battery #8 quench water, settled coke fines and recirculated water back into the quench water supply. Approximately 24,000 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

SWMU P-3 is an open-topped vault approximately 48 feet long by 15.5 feet wide by 12 feet 4 inches deep and typically contains about 10 feet of impounded water. The reinforced concrete walls of the pit are 18 inches thick. The quench pit was taken out of service in the early 1970s, around the time Battery No. 1 was replaced by Battery No. 9. The unit then served as a collecting pit for water from the wharf sump pump and it receives non-contact cooling water from a coal-handling fire pump and a low-flow continuous discharge from two small-diameter plant water lines. Approximately 20,000 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

SWMU P-4 is an open-topped vault approximately 50 feet long by 16 feet wide with a typical water depth of approximately 9.5 feet. The reinforced concrete walls of the pit are 12 inches thick. The pit has been out of service since 1990. Approximately 10,500 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

SWMU P-5 is an open-topped vault approximately 50 feet Jong, 15 feet wide, and 14 feet deep. The top of the concrete wall is about 2 feet above grade. Based on engineering drawings, the concrete thickness of the bottom of the pit is approximately 1.3 feet and the side walls of the pit are approximately 1.5 feet thick at the bottom, narrowing to 1-foot at the top. Historically, water present in the vault was from storm water and steam condensate from a water heater in the adjacent Coke Oven Office Building. Approximately 17,000 gallons of impounded water and approximately 90 CY of sediment are contained within this SWMU.

SWMU P-6 was a lime sludge settling basin [also known as a weak ammonia liquor (WAL) pit] that was taken out of service in 1994. SWMU P-6 is constructed of reinforced concrete and is 95 feet long, 12 feet wide and 20 feet deep. The reinforced concrete walls are 12 inches thick and rise to approximately 3 feet above grade. The pit is divided into two sections of equal size by a steel plate dividing wall. Approximately 90,000 gallons of impounded water is contained within this SWMU. Recoverable quantities of solid residuals were not identified during prior investigations.

Grab samples of impounded water from SWMUs P-1 through P-6 were obtained in July 2014. Samples were tested for Priority Pollutant VOCs, SVOCs, total metals, cyanide,

nitrogen (ammonia), and total phenolics. All detected concentrations were below 1 ppm except for ammonia and zinc in SWMU P-2. Solid residual samples from the pits were not collected during the RFI. Residual solids, where recoverable amounts were present (SWMUs P-2 and P-5), were collected during the July 2014 site reconnaissance. Testing included TCL VOCs, TCL SVOCs, TAL metals, and cyanide. The concentrations of detected compounds fall below the SCOs except for benzo(a)pyrene and arsenic. The RFI data included sampling of near surface slag/fill samples proximate to P-1 through P-6; there were no exceedances of the Part 375 SCOs.

SWMU Subgroup P-07, P-09, P-10

SWMU P-7 was filled with slag in the 1960s. The pit is constructed of reinforced concrete and measures approximately 42 feet long, 28 feet wide and 21 feet deep. The walls and floor of the pit are approximately 18 inches thick. The pit was divided east and west, into two sections of equal size. SWMU P-7 was a lime sludge-settling basin that was taken out of service in 1960 and filled with slag to grade. Before being filled in and covered, the top of the pit wall was about 1 foot above grade. The southern one-third of the surface of the pit is now covered with asphalt. The remaining surface is covered with a mixture of gravel, soil, and slag. The estimated volume of the pit was 915 CY.

SWMU P-9 was reportedly 54 feet long, 18 feet wide, and 18 feet deep. The pit has been filled in with slag to grade. The northern-most section is covered by an asphalt pad, which surrounds the former Ball Mill. The remaining surface is covered with a mixture of gravel and coal fines. The estimated volume of the pit is cited as 1,000 CY.

SWMU P-10 covered an area measuring approximately 20 feet by 30 feet, where a tar spill occurred in the 1980s. In July 1994, this area was covered with an asphalt pad measuring 30 feet wide and 35 feet long, with an earthen berm on the north, south, and west sides.

A test pit investigation of SWMUs P-07 was performed in January 2011. Initially, surficial material was removed from both concrete structures of P-07 and P-09 in order to locate and survey the subsurface concrete walls of each SWMU. One test pit (P7-TP-01) was excavated near the center of SWMU P-07 pit. Two composite samples of pit residuals were collected for TCL VOC and TCL SVOC analysis. Surface fill samples collected during the RFI from SWMU P-7 indicated several individual PAHs above the Part 375 SCGs although the total PAH concentration was below the CP-51 total PAH guidance for non-residential sites of 500 ppm. Subsurface fill sample results reported during the 2011 CMS investigation, however, were all below Part 375 SCGs. RFI testing also included TCLP analysis of two subsurface fill samples which indicated that the residuals of SWMU P-07 do not exhibit hazardous waste characteristics. During the RFI, one surface fill sample (0 to 2 fbgs) was collected from SWMU P-10 and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and TCLP. Only total PAHs exceeded the CP-51 total PAH guidance for non-residential sites of 500 ppm. The fill sample did not exhibit hazardous waste characteristics. In July 2011 during additional site reconnaissance of nearby SWMUs, residual tar blebs were observed at the surface east of the decommissioned tar decanter

tanks in the general vicinity of SWMUs P-7 and P-10. In October of 2015 approximately 1,200 CY of the hazardous waste/fill material in SWMU P-9 and a portion of the SWMU P-10 waste that overlaid SWMU P-9 was treated with Portland cement to reduce the TCLP benzene concentrations to below 0.5 ppb. Once the treatment objective was met, the treated waste/fill was consolidated with other waste/fill in the ATP containment cell for final disposal as part of OU-2. The SWMU was backfilled with Department-approved material to existing grade.

SWMUs P-11, P-11A, and P-12 formerly Benzol Plant Storage Group

SWMU P-11 and P-11A, also known as the Benzol Plant Tank Storage Sub-Area, is located within the Benzol Plant facility (see Plate 4-10 P-11A, Plate 4-12 P-11, P-12). The Benzol Plant, located at the southern end of the Coke Division facility, measures approximately 300 feet wide (east to west), 425 feet long (north to south), and covers approximately 3 acres. The surface of this portion of the Coke By-Products Sub-Area is generally flat and covered with coal, coke fines, and slag. All of the Above-ground Storage Tanks (ASTs) associated with this Unit have reportedly been removed. Two below-grade structures remain; the South Sump and Pit No. 17.

SWMU P-12 is a 30- by 40-foot rectangular area that was used to temporarily store 368 tons of oil-contaminated soil generated during the cleanup of a 1987 "debenzolized" wash oil excursion and is located in an area just outside the southeast comer of the former Benzol Plant enclosure. SWMU P-12 is an at-grade area enclosed on its north, west, and east sides by a 5-foot concrete wall and on the south side by an asphalt road that is approximately 6 inches higher than the SWMU P-12 surface. Although the SWMU is surrounded by the walls and an adjacent road, surface water can run off the area to the southeast, where it drains around the wall and back into the southeastern portion of the Benzol Plant and eventually infiltrates into the ground. Two slag/fill samples from P-12 were analyzed during the RFI, both from the 0-0.5 fbgs interval; none of the parameters exceeded Part 375 SCOs. The samples were also analyzed via TCLP and did not exhibit hazardous waste characteristics. One Synthetic Precipitation Leaching Potential (SPLP) sample analyzed for benzene exceeded the ambient groundwater standard, indicating the potential benzene to leach from SWMU P-12 into groundwater.

SWMUs P-11, P-11A and P-12 are part of the larger Coke Plant By-Products SWMU Group and have been addressed as Operable Unit 4 (OU-4) as discussed in Section 6.2. The final remedy for the groundwater associated with this SWMU Group is to pump contaminated groundwater from the area of the Benzol Yard (P-11 and P-12) and the general area of the Old Benzol Yard (P-11A), treat the groundwater, maintain hydraulic control over the OU-4 area (i.e., maintain an inward gradient from the Gateway MetroPort Ship Canal toward the collection wells, westerly), and treat the source areas.

RFI slag/fill and groundwater sampling and analysis occurred between 1995 and 1998. Slag/fill samples were generally collected from the smear zone or below the water table except for one surficial sample, P11-1 (0-0.5 fbgs). There were no exceedances of the Part 375 SCOs at P-11-1 (0-0.5 fbgs), SB-09 (6-8 fbgs), SB-10 (4-6 fbgs), SB-11 (4-6

fbgs), RW-1 (2-4 fbgs), RW-2 (2-4 fbgs), and RW-3 (1-3 fbgs). The sample from P-11-1 (0-0.5 fbgs) did not exhibit hazardous waste characteristic by TCLP testing. Two slag/fill samples from SWMU P-12 were analyzed during the RFI, both from the 0-0.5 fbgs interval; none of the parameters exceeded Part 375 SCOs. The samples were also analyzed by TCLP and did not exhibit hazardous waste characteristics. One sample analyzed for benzene exceeded the Protection of Groundwater SCO, indicating the potential for benzene to leach from SWMU P-12 into groundwater.

SWMU P-18A/B – Blast Furnace Cooling Tower and Cold and Hot Wells

SWMU P-18 was the Scrubber Water Cooling Tower, Hot and Cold Well complex located at the south end of the Gateway MetroPort Ship Canal. The Hot and Cold Wells consisted of water-filled pits constructed with steel sheet pile. The sheet piles were driven into bedrock and the interiors of the wells were excavated to a depth of about 39 feet below surrounding grade. The Hot Well outline was an irregular shape, about 130 feet across the longest dimension, 16 feet across the narrowest section, and water depth was approximately 10 feet. The Cold Well was rectangular, about 173 long, 23 feet wide, and water depth was approximately 9 to 12 feet. The Hot and Cold wells were dredged and the spoils solidified and placed in the OU-02 ATP cell. The wells were then filled to grade with Department-approved material.

SWMU S-19 – Murphy's Mountain, Landfill AA

SWMU S-19 is located west of the Coke Oven coal storage area and east of BSC Highway 11. The SWMU was constructed as a wind break from steel-making slag reclamation debris mixed with varying amounts of construction and demolition debris. It was an elongate-shaped pile approximately 15 feet high, 1,300 feet long (north to south), and 350 feet wide (east to west). The remaining footprint of SWMU S-19 covers an area of approximately 10 acres and is sparsely vegetated with grasses and small bushes. The feature has subsequently been mined or reclaimed with only a general footprint of the original mound remaining.

Analytical testing of slag/fill samples from SWMU S-19 collected during the RFI did not identify any exceedances of the Part 375 SCOs except for benzo(a)pyrene at one surface (0-0.5 fbgs) and one subsurface location (4-14 fbgs) and arsenic in one of nine slag samples tested. TCLP analytical results from the RFI indicated that the waste/fill samples do not exhibit hazardous characteristics. Synthetic Precipitation Leaching Potential (SPLP) results from three surface samples indicate an exceedance of the Protection of Groundwater SCO for methylene chloride. SPLP results in one subsurface (8-10 fbgs) sample exceeded Protection of Groundwater SCOs for ethylbenzene, toluene and xylene. Additional sampling was not included in the CMS Work Plan nor was any performed during the CMS.

SWMU S-25 – Landfill/Impoundment under North End of Coal Pile

SWMU S-25 is an unmarked circular area approximately 260 feet wide by 275 feet

long (approximately 1.4 acres). The approximate location of S-25 is the northern end of the current coal storage area, west of Coke Oven Battery No. 8. The SWMU is visible on aerial photographs taken in 1951, 1955 and 1959. Although the SWMU was described by the USEPA in the RFA as “pits”, close inspection of the photographs and consultation with former BSC employees familiar with operations in that area by EPA have led to the conclusion that SWMU S-25 was, in fact, a pile, roughly circular in shape, surrounded by a depression, where materials were removed for reclamation of metallics. The pile is not observed in aerial photographs after 1961.

The RFI included collection and testing of four slag/fill samples from this Unit. Analytical testing of slag/fill samples from this Unit did not exhibit any exceedances of the Part 375 SCOs. Additional investigation was not included in the CMS Work Plan nor was any performed during the CMS.

SWMU S-26 – Fill Area near Coke Battery No. 8

SWMU S-26 is a 7-acre area located at the northwest comer of the Ship Canal. Formerly a part of the Bethlehem Steel Corporation’s operations, the western half of the SWMU is owned by Tecumseh and the eastern half by Gateway Trade Center (Gateway). In general, SWMU S-26 occupies the area between Coke Oven Battery Numbers 7 and 8 and the Ship Canal. The northwestern portion of SWMU S-26 underlies a portion of Coke Oven Battery No. 8 and a roadway. The northeastern portion of the SWMU is covered with slag fill and is generally flat. A pump station (formerly BSC Pump House No. 6) is located at the extreme northeastern portion of SWMU S-26 and removes water from the Buffalo Outer Harbor for use as process water by BSC’s Lackawanna Coke Division, BSC’s Galvanized Products Division and by an off-site bar mill owned by Republic Steel.

The analytical results from subsurface soil/fill samples obtained within the limits of S-26 indicate SVOCs (primarily PAHs) as the only compounds exceeding their respective Part 375 SCOs with total PAH concentrations ranging between 0.35 and 2,900 ppm; excluding results from boring S26-B-3 at which coal tar was observed. Results from boring S26-B-3 (6-8 fbgs) indicate that although coal tar is present, it is limited in vertical extent to that interval. The coal tar impacts at S26-B-03 are also limited in horizontal extent as evidenced by surrounding soil/fill samples collected with reported PAH concentrations two orders of magnitude less than S26-B-03. Arsenic was the only metal detected above the Part 375 SCO.

Soil

Soil samples were collected at the site during the RFI, from on-site and off-site locations to further delineate the source area. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from a depth of 2 – 20 feet to assess soil contamination impacts to groundwater. Soil samples were collected in the vicinity of the source areas and beneath the former on-site building in OU-06. Coking process residuals present in pits are also included herein as soils because of their low volume and their anticipated dewatering or solidification and subsequent dry disposal.

The results indicate that soils at the site exceed the Industrial SCO and/or Protection of Groundwater SCO for volatile and semi-volatile organics, arsenic and mercury. The Pre-Design Investigation will be used to determine if other soils within the OUs are impacted with these or other contaminants. Through the additional investigation and subsequent design of the remedy, any impacted soils and or source areas will be addressed and cleaned up to eliminate the potential threat to the waters of Lake Erie from impacted groundwater.

Table(s) 1 – Soil

Operable Unit 06 (P-8, P-74, P-75)

Detected Constituents	Concentration Range Dected (ppm)	Restricted Use SCG[1] (ppm)	Frequency Exceeding Restricted SCG	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
VOCs					
Benzene	nd-500	89	1 of 28	0.06	5 of 28
Toluene	nd-18	1000	0/28	0.7	5 of 28
Xylene	nd-140	1000	0/28	1.7	12 of 28
SVOCs					
Naphthalene	nd-6500	1000	5 of 28	12	5 of 28
Total PAHs	nd-500	na	na	na	na
Metals					
Arsenic	nd-90.3	16	5 of 28	16	5 of 28
Mercury, total	0.021-22.9	5.7	5 of 28	0.73	11 of 28

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater
nd = non-detect
na = not applicable

The primary soil contaminants are polycyclic aromatic hydrocarbons (PAHs) and Mercury associated with residues from the operation of the former Steel Mill. The primary soil contamination is associated with SWMUs P-8 (Waste Oil Storage Tanks), P-74 (Solid Fuel Mix Storage Piles A, B, C, and D), and P-75 (Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar).

Based on the findings of the RCRA Facility Investigation, the presence of PAHs and Mercury has resulted in the contamination of soil. The OU contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, PAHs, Arsenic and Mercury.

Operable Unit 07 (P-1 thru P-6 - Quench Pits)

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
TCL VOCs (ppm)					
Acetone	0.044-0.12	1,000	0 of 2	0.05	**1 of 2**
2-Butanone	ND-0.02	1,000	0 of 2	--	--
Methylene Chloride	0.004-0.26	1,000	0 of 6	0.05	**1 of 6**
TCL SVOCs (ppm)					
Benzo(a)anthracene	0.78-5.1	11	0 of 8	1	**4 of 8**
Benzo(a)pyrene	0.57-6.2	1.1	**4 of 8**	22	0 of 8
Benzo(b)fluoranthene	0.62-6.2	11	0 of 8	1.7	**4 of 8**
Benzo(k)Fluoranthene	0.24-3.4	110	0 of 8	1.7	**2 of 8**
Chrysene	0.88-5	110	0 of 8	1	**4 of 8**
Dibenzo(a,h)anthracene	0.17-0.71	1.1	0 of 8	1,000	0 of 8
Dibenzofuran	1.6-2	1,000	0 of 2	210	0 of 2
Indeno(1,2,3-cd)pyrene	0.48-3.2	11	0 of 8	8.20	0 of 8
3-Methylphenol and 4-Methylphenol	1.3-3.2	1,000	0 of 8	0.33	**5 of 8**
2-Methylphenol	0.16-1.7	1,000	0 of 8	0.33	**4 of 8**
Naphthalene	0.78-14	1,000	0 of 8	12	**1 of 8**
Phenol	0.37-2.8	1,000	0 of 8	0.33	**6 of 8**
Total PAHs	0.29-79	<500	0 of 8	--	--
Inorganic Compounds (ppm)					
Arsenic	2.6-26	16	**2 of 8**	16	**2 of 8**
Cadmium	1.4-3.4	60	0 of 8	7.5	0 of 8
Chromium	1.5-216	6,800	0 of 8	--	--
Copper	100-160	10,000	0 of 2	1,720	0 of 2
Lead	1.8-250	3,900	0 of 8	450	0 of 8
Manganese	780-2300	10,000	0 of 2	2,000	**1 of 2**
Mercury	0.18-3.3	5.7	0 of 8	0.73	**2 of 8**
Nickel	6-63	10,000	0 of 8	130	0 of 8
Zinc	500-820	10,000	0 of 2	2,480	0 of 2

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Solid residual samples from the pits were not collected during the RFI. Residual solids, where recoverable amounts were present (SWMUs P-2 and P-5), were collected during

the July 2014 site reconnaissance. Testing included TCL VOCs, TCL SVOCs, TAL metals, and cyanide. The concentrations of detected compounds fall below the applicable Industrial SCOs except for benzo(a)pyrene and arsenic. When considering the Protection of Groundwater SCO, exceedances were observed for the VOCs Acetone and Methylene Chloride, a number of SVOCs and the metals Manganese and Mercury. The RFI data included sampling of near surface slag/fill samples proximate to P-1 through P-6; there were no exceedances of the Part 375 SCOs.

Operable Unit 07 (P-7, P-9, and P-10 – Settling Basins)

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] ppm)	Frequency Exceeding Groundwater SCOs
TCL VOCs (ppm)					
Benzene	0.003-270000	89	**1 of 4**	0.06	1 of 4
Toluene	0.002-110000	1,000	**1 of 4**	0.70	1 of 4
Xylenes, Total	0.002-95000	1,000	**1 of 4**	1.60	1 of 4
TCL SVOCs (ppm)					
Acenaphthene	0.035-280000	1,000	**1 of 4**	98	**1 of 4**
Acenaphthylene	0.46-4600000	1,000	**1 of 4**	107	**1 of 4**
Anthracene	0.34-4000000	1,000	**1 of 4**	1,000	**1 of 4**
Benzo(a)anthracene	0.4-3500000	11	**3 of 4**	1	**3 of 4**
Benzo(a)pyrene	0.37-3100000	1.1	**3 of 4**	22	**2 of 4**
Benzo(b)fluoranthene	0.5-2900000	11	**3 of 4**	1.7	**3 of 4**
Benzo(ghi)perylene	0.14-900000	1,000	**1 of 4**	1,000	**1 of 4**
Benzo(k)fluoranthene	0.19-26	110	0 of 4	1.7	**2 of 4**
Chrysene	0.42-3200000	110	**1 of 4**	1	**3 of 4**
Dibenz(a,h)anthracene	ND-2.7	1.1	**1 of 4**	1,000	0 of 4
Dibenzofuran	0.32-3100000	1,000	**1 of 2**	210	**1 of 4**
Fluoranthene	1.2-9600000	1,000	**1 of 4**	1,000	**1 of 4**
Fluorene	0.4-4100000	1,000	**1 of 4**	386	**1 of 4**
Indeno(1,2,3-cd)pyrene	0.13-880000	11	**3 of 4**	8.20	**3 of 4**
3-Methylphenol and 4-Methylphenol	1.2-280000	1,000	**1 of 4**	0.33	**3 of 4**
2-Methylphenol	0.28-91000	1,000	**1 of 4**	0.33	**1 of 4**
Naphthalene	2.8-22000000	1,000	**1 of 4**	12	**3 of 4**

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] ppm)	Frequency Exceeding Groundwater SCOs
Phenanthrene	1.4-15000000	1,000	**1 of 4**	1,000	**1 of 4**
Phenol	1.3-240000	1,000	**1 of 4**	0.33	**3 of 4**
Pyrene	58-7800000	1,000	**1 of 4**	1,000	**1 of 4**
Total PAHs	9-84360000	<500	**2 of 4**	--	--
Inorganic Compounds (ppm)					
Chromium	184-343	6,800	0 of 2	--	--
Lead	18.1-192	3,900	0 of 2	450	0 of 2
Mercury	ND-0.65	5.7	0 of 2	0.73	0 of 2
Nickel	6.8-61.6	10,000	0 of 2	130	0 of 2
Cyanide	6.8-52.2	10,000	0 of 2	40	**1 of 2**

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Surface fill samples collected during the RFI from SWMU P-7 indicated several individual PAHs above the Part 375 SCOs although the total PAH concentration was below the CP-51 total PAH guidance of 500 ppm for non-residential sites. Subsurface fill sample results reported during the 2011 CMS investigation, however, were below Part 375 SCOs. RFI testing also included TCLP analysis of two subsurface fill samples which indicated that the residuals of SWMU P-07 do not exhibit hazardous waste characteristics. During the RFI, one surface fill sample (0 to 2 fbgs) was collected from SWMU P-10 and analyzed for TCL VOCs, TCL SVOCs, TAL metals, and TCLP. Only total PAHs exceeded the CP-51 total PAH guidance of 500 ppm for non-residential sites. The fill sample did not exhibit hazardous waste characteristics. Exceedances are present with the SWMU group for both Industrial use and Protection of Groundwater SCOs for VOCs, SVOCs, and Cyanide.

Operable Unit 07 (P-11 and P-12 – Benzol Plant Tank/Storage Areas)

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
TCL VOCs (ppm)					
Benzene	0.0018-2800	89	**8 of 17**	0.06	**12 of 17**
Ethylbenzene	0.005-170	780	0 of 14	0.1	**10 of 14**
Toluene	0.001-1700	1,000	**2 of 17**	0.70	**10 of 17**
Xylenes, Total	0.0013-1100	1,000	**5 of 17**	1.60	**11 of 17**
TCL SVOCs (ppm)					
Naphthalene	0.032-1100	1,000	**1 of 14**	12	**10 of 14**
Total PAHs	6-7	<500	0 of 3	--	--
Inorganic Compounds (ppm)					
Arsenic	5.4-30.5	16	**1 of 3**	16	**1 of 3**
Cadmium	1.4-8.9	60	0 of 3	7.5	**1 of 3**

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
Mercury	1.5-4.2	5.7	0 of 3	0.73	**3 of 3**

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

RFI slag/fill and groundwater sampling and analysis occurred between 1995 and 1998. Slag/fill samples were generally collected from the smear zone or below the water table except for one surficial sample. There were no exceedances of the Part 375 SCOs in the P-11 samples and those samples did not exhibit hazardous waste characteristic via TCLP. Two slag/fill samples from SWMU P-12 were analyzed during the RFI, both from the 0-0.5 fbgs interval; none of the parameters exceeded Part 375 SCGs. The samples were also analyzed via TCLP and did not exhibit hazardous waste characteristics. One sample analyzed for benzene exceeded the Protection of Groundwater SCO, indicating the potential for benzene to leach from SWMU P-12 into groundwater. Samples collected from the SWMUs during the CMS exceeded applicable SCOs for VOCs, SVOCs, and Metals, for both Industrial use and the Protection of Groundwater.

Operable Unit 07 (P-18A/B – Blast Furnace Wells)

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
TCL SVOCs (ppm)					
Benzo(a)anthracene	0.24-20	11	**1 of 7**	1	**5 of 7**
Benzo(a)pyrene	0.15-4.2	1.1	**1 of 7**	22	0 of 7
Benzo(b)fluoranthene	0.14-11	11	0 of 7	1.7	**2 of 7**
Benzo(k)Fluoranthene	0.37-2.9	110	0 of 7	1.7	**1 of 7**
Chrysene	0.13-7.7	110	0 of 7	1	**4 of 7**
Dibenzo(a,h)anthracene	0.18-1.2	1.1	**1 of 7**	1,000	0 of 7
Indeno(1,2,3-cd)pyrene	0.24-5.3	11	0 of 7	8.20	0 of 7
Phenol	0.57-1	1,000	0 of 7	0.33	**2 of 7**
Total PAHs	1.1-129	<500	0 of 7	--	--
Inorganic Compounds (ppm)					
Arsenic	26.1-91	16	**7 of 7**	16	**7 of 7**
Cadmium	4.7-20.3	60	0 of 7	7.5	**4 of 7**
Lead	2200-14000	3,900	**6 of 7**	450	**7 of 7**
Mercury	0.44-0.59	5.7	0 of 7	0.73	0 of 7
Nickel	15.1-39.5	10,000	0 of 7	130	0 of 7
Selenium	ND-9.9	6,800	0 of 7	4	**1 of 7**
Silver	1.4-37.2	6,800	0 of 4	8.3	**3 of 4**
Cyanide	11-314	10,000	0 of 7	40	**3 of 7**
pH SOL	9.7-10.3	--	--	--	--

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Residuals dredged from the hot and cold wells comprising SWMU 18 A/B exhibited exceedances for SVOCs, and Inorganics, the material has been solidified and placed in the on-site ATP containment cell and will be managed in perpetuity with the wastes contained therein.

Operable Unit 07 (S-19 and S-25 – Slag Fill/Debris and Metallics Recovery Piles)

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
TCL VOCs (ppm)					
TCL SVOCs (ppm)					
Benzo(a)anthracene	0.037-2.3	11	0 of 8	1	**2 of 8**
Benzo(a)pyrene	0.77-1.8	1.1	**2 of 6**	22	0 of 6
Benzo(b)fluoranthene	0.042-2	11	0 of 6	1.7	**1 of 6**
Benzo(k)Fluoranthene	0.18-0.89	110	0 of 6	1.7	0 of 6
Chrysene	0.044-2.5	110	0 of 8	1	**2 of 8**
Indeno(1,2,3-cd)pyrene	0.17-0.68	11	0 of 6	8.20	0 of 6
Total PAHs	0.42-30	<500	0 of 8	--	--
Inorganic Compounds (ppm)					
Arsenic	1.5-54.6	16	**1 of 6**	16	**1 of 6**
Cadmium	0.69-7.9	60	0 of 4	7.5	**1 of 4**
Chromium	710-1580	6,800	0 of 8	--	--
Lead	711-199	3,900	0 of 8	450	0 of 8
Nickel	31.8-389	10,000	0 of 6	130	**1 of 6**
Selenium	1.8-20.3	6800	0 of 6	4	**2 of 6**
Silver	2.6-10	6800	0 of 4	8.3	**2 of 4**
pH SOL	8.9-10.3	--	--	--	--

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

Analytical testing of slag/fill samples from SWMU S-19 collected during the RFI identified two exceedances of the Part 375 SCOs for benzo(a)pyrene at one surface (0-0.5 fbgs) and one subsurface location (4-14 fbgs). Arsenic exceeded the SCO in one of the slag samples tested. TCLP analytical results from the RFI indicated that the waste/fill samples do not exhibit hazardous characteristics. The RFI included collection and testing of four slag/fill samples from SWMU S-25. Results indicate exceedances of the Protection of Groundwater SCO for benzo(a)anthracene, benzo(b)fuoranthene, chrysene, and additionally metals cadmium, nickel, selenium and silver.

Operable Unit 07 (S-26 – Fill Area Near Coke Battery No. 8)

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
TCL VOCs (ppm)					
Acetone	0.016-0.17	1,000	0 of 12	0.05	**5 of 12**
Benzene	0.0027-62	89	0 of 12	0.06	**5 of 12**

Parameter	Detected Range	Industrial SCOs[1] (ppm)	Frequency Exceeding Industrial SCOs	Protection of Groundwater SCOs[2] (ppm)	Frequency Exceeding Groundwater SCOs
Ethylbenzene	0.02-2.6	780	0 of 12	1	**1 of 12**
Methylene Chloride	0.0037-0.12	1,000	0 of 12	0.05	**4 of 12**
Toluene	0.0077-3.8	1,000	0 of 12	0.70	**1 of 12**
Xylenes, Total	0.0013-18	1,000	0 of 12	1.60	**1 of 12**
TCL SVOCs (ppm)					
Acenaphthene	0.024-440	1,000	0 of 19	98	**6 of 19**
Acenaphthylene	0.027-390	1,000	0 of 19	107	**1 of 19**
Anthracene	0.074-940	1,000	0 of 19	1,000	0 of 19
Benzo(a)anthracene	0.046-1400	11	**13 of 19**	1	**16 of 19**
Benzo(a)pyrene	0.031-1000	1.1	**16 of 19**	22	**12 of 19**
Benzo(b)fluoranthene	0.038-1400	11	**13 of 19**	1.7	**16 of 19**
Benzo(ghi)perylene	0.026-840	1,000	0 of 19	1,000	0 of 19
Benzo(k)Fluoranthene	0.045-410	110	**1 of 19**	1.7	**12 of 19**
Chrysene	0.033-1300	110	**3 of 19**	1	**16 of 19**
Dibenz(a,h)anthracene	0.024-200	1.1	**12 of 19**	1,000	0 of 19
Dibenzofuran	0.036-2000	1,000	**1 of 19**	210	**1 of 19**
Fluoranthene	0.063-4900	1,000	**1 of 19**	1,000	**1 of 19**
Fluorene	0.052-1400	1,000	**1 of 19**	386	**1 of 19**
Indeno(1,2,3-cd)pyrene	0.036-740	11	**12 of 19**	8.20	**13 of 19**
Naphthalene	0.023-210000	1,000	**7 of 19**	12	**10 of 19**
Phenanthrene	0.035-7700	1,000	**1 of 19**	1,000	**1 of 19**
Pyrene	0.054-3400	1,000	**1 of 19**	1,000	**1 of 19**
Total PAHs	0.349-239360	<500	**12 of 19**	--	--
Inorganic Compounds (ppm)					
Arsenic	2.2-40.4	16	**1 of 11**	16	**1 of 11**
Chromium	4.3-1400	6,800	0 of 11	--	--
Lead	4.8-230	3,900	0 of 11	450	0 of 11
Mercury	0.18-4	5.7	0 of 11	0.73	**3 of 11**

[1]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Industrial Use
[2]6 NYCRR Part 375-6.8 (b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater

The analytical results from subsurface soil/fill samples obtained within the limits of S-26 indicate SVOCs (primarily PAHs) as the compounds exceeding their respective Part 375 SCOs with total PAH concentrations ranging between 0.35 and 2,900 ppm; excluding results from boring S26-B-3 at which coal tar was observed. Arsenic was detected above

the Part 375 SCO. Mercury was present in three samples above the Protection of Groundwater SCO.

The primary soil contaminants are SVOCs and metals associated with residuals from the operation of the former coke ovens located in the former coking operation and the coke gas byproducts area.

Metals contamination is associated with historic fill activity at the site. Disposal of slag, ash, clinker, and coal has resulted in inorganic soil contamination above the industrial SCGs. The contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, VOCs, SVOCs and metals.

Surface/Impounded Water

Surface water is present within OU-07 as impounded water retained in the pits and vaults of the former coking and coke gas byproducts processes. The samples were collected to assess the surface water conditions present within the pits.

Table(s) 2 – Surface/Impounded Water

OU-07 only, OU-06 contains no impoundments

P-1 thru P-6 – Quench Pits

Parameter	Detected Range	Class D Ambient Water Quality Standards (ppb)	Frequency Exceeding Ambient Water Quality Standards
TCL SVOCs (ppb)			
Fluorene[2]	4.9-14	4.8	**2 of 4**
Phenanthrene[2]	16-49	4.5	**2 of 4**
Phenol[1]	74-42000	5	**2 of 4**
Inorganic Compounds (ppb)			
Mercury[1]	0.2-1	0.0007	**2 of 10**
Cyanide[1]	1-270	22	**1 of 10**

[1]New York State Class D Ambient Water Quality Standards from 6 NYCRR Part 703
[2]New York State Class D Ambient Water Quality Guidance Values
[3]New York State Class D Ambient Water Quality Standards based on unavailable general chemistry data (i.e. pH, temperature, hardness)
[4]New York State Class D Ambient Water Quality Standard not available for this substance

Grab samples of water from SWMUs P-1 through P-6 were obtained in July 2014. Samples were tested for Priority Pollutant VOCs, SVOCs, total metals, cyanide, nitrogen (ammonia), and total phenolics. Exceedances of the Ambient Water Quality Standards were observed for the SVOCs Fluorene, Phenanthrene, Phenol and metals Mercury and Cyanide.

P-11 and P-12 – Benzol Plant Tank/Storage Areas

Parameter	Detected Range	Class D Ambient Water Quality Standards (ppb)	Frequency Exceeding Ambient Water Quality Standards
TCL VOCs (ppb)			
Benzene[1]	29000-750000	10	**4 of 4**
Ethylbenzene[2]	39-600	150	**1 of 4**
Toluene[1]	2300-270000	6,000	**1 of 4**
Xylenes, Total[2]	360-160000	590	**1 of 4**
TCL SVOCs (ppb)			
Fluorene[2]	ND-1400	4.8	**1 of 2**
Naphthalene[2]	660-25000	110	**2 of 2**
Phenanthrene[2]	ND-80	4.5	**1 of 2**
Phenol[1]	ND-390	5	**1 of 2**
Inorganic Compounds (ppb)			
Mercury, Total[1]	ND-27.1	0.0007	**1 of 2**
Mercury, Dissolved[1]	4.6	0.0007	**1 of 1**
Cyanide[1]	25-970	22	**2 of 2**

[1]New York State Class D Ambient Water Quality Standards from 6 NYCRR Part 703
[2]New York State Class D Ambient Water Quality Guidance Values
[3]New York State Class D Ambient Water Quality Standards based on unavailable general chemistry data (i.e. pH, temperature, hardness)
[4]New York State Class D Ambient Water Quality Standard not available for this substance

The primary surface water contaminants are VOCs, SVOCs and Metals. The primary surface water contamination is located within the pits of the former coal and coking operations.

Based on the findings of the RCRA Facility Investigation the presence of VOCs, SVOC, and Metals has resulted in the contamination of surface or impounded water. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process are, BTEX compounds. If the Pre-Design Investigation reveals additional impacts to impounded water, those constituents will be included in the discharge requirements of any treatment facility operated for the implementation of the remedy or disclosed in the characterization reports if disposed offsite.

Exhibit B

SUMMARY OF THE CLEANUP OBJECTIVES

The goal for the corrective measure program is to achieve restricted (industrial) use of the site and to restore groundwater quality to meet applicable SCGs, to the extent feasible. At a minimum, the corrective measures shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified in OU-06 and OU-07 at this facility through the proper application of scientific and engineering principles.

The established cleanup objectives for OU-06 and OU-07 at this facility are:

Compound	Soil Cleanup Objective[1] (ppm or mg/kg)	Groundwater Cleanup Objective[2] (ppb or ug/L)
VOCs		
Benzene	89/0.06	1
Chlorobenzene	1000/1.1	5
1,2-Dichlorobenzene	1000/1.1	3
Cis-1,2-Dichloroethene	1000/0.25	5
Trans-1,2-Dichloroethene	1000/0.19	5
Ethylbenzene	780/1	5
Styrene	NV/NV	5
Toluene	500/0.7	5
1,2,4-Trichlorobenzene	NV/NV	5
Trichloroethene	400/0.47	5
1,2,4-Trimethylbenzene	380/3.6	5
1,3,5-Trimethylbenzene	380/8.4	5
Vinyl Chloride	27/0.02	2
Xylenes, total	1000/1.6	5
SVOCs		
Acenaphthene	1000/98	20
Benzo(a)anthracene	11/1	0.002
Benzo(a)pyrene	1.1/22	ND
Benzo(b)fluoranthene	11/1.7	0.002
Benzo(k) fluoranthene	110/1.7	0.002
Biphenyl	NV/NV	5
Bis(2-ethylhexyl)phthalate	NV/435	5
Chrysene	110/1	0.002
2,4-Dimethylphenol	NV/NV	1
Indeno(1,2,3-cd)pyrene	11/8.2	0.002
2-Methylphenol	1000/0.33	1

Compound	Soil Cleanup Objective[1] (ppm or mg/kg)	Groundwater Cleanup Objective[2] (ppb or ug/L)
4-Methylphenol	1000/0.33	1
Naphthalene	1000/12	10
Phenol	1000/0.33	1
Total PAHs	500[3]	NV
PFAS		
Perfluorooctanoic acid (PFOA)	0.500	0.010
Perfluorooctanesulfonic acid (PFOS)	0.440	0.010
Metals		
Arsenic	16/16	25
Barium	10,000/820	1000
Lead	3900/450	25
Mercury, total	5.7/0.73	0.7
Selenium	6,800/4	10
Other		
Asbestos		*

1. 6NYCRR Part 375: Industrial Soil Cleanup Objectives (ISCOs)/Protection of Groundwater SCOs
2. SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703 - Surface Water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
3. Site-specific soil cleanup objectives based upon the Department's October 21, 2010 Final Soil Cleanup Guidance (CP-51) - 500 ppm subsurface soil cleanup level for Total Polycyclic Aromatic Hydrocarbons (PAHs) (at least one foot of soil cover must meet ISCOs).

* 7,000,000 fibers (longer than 10 um)/L
ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil.
ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
ppt: parts per trillion, which is equivalent to nanograms per liter, ug/L, in water.
SPLP = Synthetic Precipitation Leaching Procedure.
ND = Not Detected.
NV = No Value.

Exhibit C

Description of Remedial Alternatives

The following alternatives were considered based on the cleanup objectives (see Exhibit B) to address the contaminated media identified in OU-06 and OU-07 as described in Exhibit A:

The detailed analysis of the alternatives is provided in the Corrective Measures Study Report.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the OU-06 and OU-07 completed by the ICM(s) described in Section 6.2. This alternative leaves the OUs in their present condition and does not provide any additional protection of the environment.

The costs associated with this alternative are estimated to be:

Present Worth: $0
Capital Cost:..... $0
Annual Costs:..... $0

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the OUs completed by the ICM(s) described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the ICM. This alternative maintains engineering controls which were part of the ICM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs.

Present Worth: $371,500
Capital Cost:..... $0
Annual Costs:..... $12,500

Alternative 3: Pit clean-out and consolidation in SW-CAMU (SWMU Group P-1 thru P-6, P-7 and P-10), Vegetated Soil Cover (SWMUs P-11, P-11A, P-12 and S-25), Cover in Place (SWMU S-19), , and Excavation and Relocation to CAMU (SWMU S-26)

This alternative includes excavation of petroleum-impacted slag/fill that is visually stained and/or contains NAPL from the unsaturated zone (depth of impact varies between 0 and 16 fbgs) as well as slag/fill with total PAH concentrations greater than 500 ppm. It is estimated that 22,000 to 55,000 CY of impacted slag exist throughout the SWMU over an

approximate 4-acre area. Approximately 1,170 CY of mercury-impacted slag/fill would be excavated and disposed off-site; four of the five sub-areas impacted by mercury are co-located with PAH-impacted slag/fill. Excavation of the slag/fill, while technically feasible, will be extremely difficult due to the massive and cemented nature of the slag. Based on recent experience during the ATP-ECM excavation effort, concrete busters or explosives would likely be required to remove the cemented slag and an estimated 12 months would be required to excavate the slag from the SWMU, transport it and consolidate it into the SW CAMU. Excavated slag that contains free-NAPL product would be stabilized with high carbon content fly ash or another stabilizing agent (e.g., Portland cement, lime kiln dust, mill scale). The petroleum-impacted slag waste would be consolidated into the SW-CAMU where the groundwater would not be impacted by the waste as it would be stabilized and encapsulated (geo-composite soil liner, leachate collection system and low-permeability geo-composite cap). The excavation in the Tank Farm would be regraded and partially backfilled with BUD-approved slag or other non-impacted on-site slag/fill (i.e., meeting ISCOs and site -specific SCOs), assume 10,000 CY of import required. Accounting for contingency and excavation inefficiencies, the volume for ex-situ treatment and disposal of petroleum- and PAH-impacted slag/fill is estimated to range between 25,000 and 70,000 CY. Accounting for contingency and excavation inefficiencies, the volume for off-site disposal of mercury-impacted slag/fill is estimated at 1,800 CY.

The on-site impoundments will require removal of approximately 200,000 gallons of water followed by treatment in an on-site water treatment system. Following treatment of the evacuated water, samples would be collected prior to; discharge to the City of Lackawanna POTW, injection in the OU-04 Groundwater Treatment system infiltration galleries, or off-site disposal, as may be appropriate. Following the removal of water, approximately 200 CY of residual solids will be excavated from the pits and subsequently dried and/or solidified. The drying and solidification of residual solids will require the development and implementation of a stockpiling, dewatering fluids treatment, nuisance control, and Storm Water Pollution Prevention Plans, amongst others, to ensure safe handling of the excavated residuals. Following solidification, the soils will be consolidated in the on-site SW-CAMU. After pressure washing of the pit walls and floor, the pit bottoms will be mechanically broken to preclude future impoundment of precipitation and to allow for the movement of groundwater into or out of the pits. The sidewall elevations will then be reduced to grade and each pit backfilled with Department-approved material to an elevation consistent with the restoration plan for that area.

This alternative calls for the demolition and removal of those structures located in the vicinity of the SWMUs and the larger OU-06 and OU-07 areas which are not identified for reuse in the future. Characterization of the materials comprising and contained in the structures will be required before demolition and removal as described in remedial element three. Following demolition of the structures and appurtenances, waste may be placed in the on-site SW CAMU or removed from the site for disposal. After removal of structures and infrastructure, backfill of subgrade features will be completed with Department-approved materials

This alternative would entail grading the sides to eliminate the potential safety hazards using slag to flatten the side slopes. Confirmation sampling will be conducted before grading activities, with analytical results verifying attainment of remediation goals. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site. A cover will be required to allow for industrial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives.

The costs associated with this alternative are estimated to be:

Present Worth: $17,469,600
Capital Cost:..... $17,098,100
Annual Costs:..... $12,500

Alternative 4: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include the demolition and off-site disposal of the on-site buildings, excavation and off-site disposal of all waste and soil contamination above the unrestricted soil cleanup objectives. The remedy will not rely on institutional or engineering controls to prevent future exposure. There is no Site Management, no restrictions, and no periodic review. This remedy will have no annual cost, only the capital cost.

Present Worth: $35,021,800
Capital Cost:..... $35,021,800
Annual Costs:..... $0

Exhibit D

Corrective Measure Alternative Costs

Corrective Measure Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1: No Further Action	0	0	0
Alternative 2: No Further Action with Site Management	0	12,500	371,500
Alternative 3: Pit clean-out and consolidation in SW-CAMU (SWMU Group P-1 to P-6, P-7 and P-10), Vegetated Soil Cover (SWMUs P-11, P-11A, P-12 and S-25), Cover in Place (SWMU S-10 and S-19) and Excavation and Relocation to CAMU (SWMUs P-8, P-74,P-75 and S-26)	17,098,100	12,500	17,469,600
Alternative 4: Excavation and Off-Site Disposal	35,021,800	0	35,021,800

- Capital Cost (e.g., engineering cost, development of site management plan, installation of the monitoring network, or installation of a future soil vapor intrusion mitigation system, etc.) is the cost to engineer and construct the remedy.

- Annual Cost is average annual Site Management cost (e.g., operation, maintenance, monitoring, and periodic review) over the duration of the operation of the remedy; it does not vary for different years. The number in parentheses is the present worth of the annual costs computed for the expected duration of the operation of the remedy or 30 years, whichever is less (assumed 30 years; i=5%).

- Present Worth is calculated by adding the capital cost to the present worth of the annual costs computed for the expected duration of the operation of the remedy or 30 years, whichever is less.

- 5% interest rate was used to calculate present worth.

[1] Annual costs associated with OM&M of the SW-CAMU are accounted for under OU-05.

Exhibit E

SUMMARY OF THE PROPOSED FINAL CORRECTIVE MEASURE(S)

The Department is proposing the following remedy as the final corrective measures for the SWMUs which fall within OU-06 and OU-07. The elements of the proposed corrective measures are briefly described in Section 7 and the alternatives used to select the proposed final corrective measures are presented in Exhibit C.

Basis for Selection

The alternatives were evaluated based on the cleanup objectives (see Exhibit B) to address the contaminated media identified as described in Exhibit A. The detailed analysis of the alternatives is provided in the final CMS (2019) Report and as modified herein.

Threshold Criteria

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment

Alternative 1 is not considered protective of human health or the environment because it does not eliminate direct exposure to SWMU waste material or effectively control the migration of contaminants from the SWMUs. Alternative 1 does not treat the source of the contamination. The migration and subsequent discharge of precipitation to adjacent surface water has the potential to adversely affect human as well as ecological receptors. Since Alternative 1 fails to satisfy this threshold selection criterion, it is eliminated from further consideration.

Alternatives 2 is protective of human health as the potential for contact with impacted residual solids is eliminated by backfilling with Department-approved fill, however, the environmental impact pathway is not removed, and the potential remains for contaminants to enter groundwater. Alternatives 2 does not provide a means for eliminating or reducing leaching of contaminants to groundwater and in turn does not protect Lake Erie as an ecological and drinking water resource. Alternative 2 is therefore eliminated.

Alternatives 3 and 4 are protective of human health and the environment because each alternative provides effective means to eliminate direct contact with and exposure to contaminated SMWU waste material and removes said waste from the SWMU. Alternatives 3 and 4 provide a means for eliminating or reducing the leaching of contaminants to groundwater in turn protecting the Lake Erie drinking water resource. Alternatives 3 and 4 are retained for further evaluation.

2. Compliance with Standards, Criteria, and Guidance (SCGs)

Alternatives 3 and 4 both meet the cleanup standards identified for OU-06 and OU-07. Under Alternatives 3 and 4 the top 1-foot of soil/fill outside the SWMUs and CAMU will meet the Soil Cleanup Objectives for Industrial Use identified in Exhibit B. In both alternatives, the impacted surface water and solid residuals will be removed from the SWMUs and disposed of. Following cleaning and any physical alterations of structures, the features will be filled with Department-approved site-derived aggregate materials or materials meeting the industrial use criterial of 6 NYCRR Part 375-6.8(b). Under Alternative 3, an engineered cap consisting of 2-feet of various components will be installed over the SWMUs and CAMU. Under Alternative 4 SWMU waste would be excavated and disposed off-site at a permitted facility with an equivalent engineered cap. Alternatives 3 and 4 eliminate the nuisance condition associated with tires and other solid waste debris consistent with SCGs as well as any potential contribution to groundwater contamination. Alternatives 3 and 4 would reduce contaminant loadings to groundwater and surface water by over 99% and residual groundwater impacts would be monitored for natural attenuation and eventual compliance with SCGs as part of the OU-10 Site-Wide Groundwater remedy.

Balancing Criteria

3. Long-term Effectiveness and Permanence

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternatives 3 and 4). Under Alternatives 3 and 4 long-term effectiveness is achieved through equivalent measures. Under Alternative 3, Impoundment SWMUs closed in-place will have an engineered cap meeting the requirements of 6 NYCRR Part 360, similar to a permitted off-site facility. The CAMU will have an engineered cap, liner, and leachate collection system meeting the requirements of 6 NYCRR Part 360 similar to an off-site facility.

Alternative 4 results in removal of all of the chemical contamination at the site and removes the need for property use restrictions and long-term monitoring; however, wastes would be relocated to an off-site TSDF which would include leachate collection and low-permeability bottom liners. Alternative 3 would result in the removal and consolidation on-site of most of the contaminated soil at the site, but it also requires an environmental easement and long-term monitoring.

Under Alternative 3 a cover system will be constructed and remain in place. The need for monitoring and maintenance is required for the lifespan of the cover system. Under Alternative 4 SWMU waste would be relocated to a permitted facility where these concerns would be eliminated for the site.

4. Reduction of Toxicity, Mobility or Volume

Under Alternatives 3 and 4 toxicity may be reduced though treatment prior to consolidation or disposal in the CAMU or off-site at a permitted facility.

Under Alternative 3 a reduction of mobility will be achieved through the installation of an engineered cap in the Impoundment SWMUs and CAMU that will greatly reduce infiltration, leaching and stormwater erosion migration of contaminants from the SWMU and consolidated CMS area waste. The amount of rainfall infiltration would be reduced through the waste/fill by over 99%; the reduction in groundwater loadings would be projected to be proportionate to the reduction in infiltration. Under Alternatives 3 and 4 SWMU waste consolidated from the CMS area may be treated prior to disposal, additionally, under Alternative 3 the engineered liner and leachate collection system will eliminate contaminant mobility to the surrounding environmental media.

Under Alternative 4 contaminant mobility will be eliminated by the placement of SWMU waste into a lined and capped unit with leachate collection.

Under Alternatives 3 and 4 volume of SWMU waste will not be reduced. There may be an increase in volume under Alternatives 3 and 4, as treatment of the waste material may require the addition of amendments to solidify or stabilize the waste.

5. Short-term Impacts and Effectiveness

Under Alternatives 3 and 4 disturbance of SWMU waste and slag/fill may result in nuisance conditions (dust and odors) and possible contaminant release and exposure. The use of administrative controls, personal protective equipment (PPE), and dust/odor suppression techniques will mitigate nuisance conditions and exposures.

Under Alternative 3 excavation, consolidation, and disposal of CMS area wastes will be conducted in an area not in close proximity to residential areas or receptors not directly involved with site operations.

Under Alternative 4 the volume of CMS area waste to be transported increases. Transportation will continue over an extended period of time and has the potential to be in close proximity to residential and commercial increasing exposure risks. Alternative 4 would result in the greatest short-term CO2, particulate, and greenhouse gas emissions from heavy equipment involved with excavation, transportation, and placement of the waste/fill in an Off-Site TSDF. Alternative 3 would result in slightly less emissions due to shorter transportation.

Both Alternative 3 and 4 permanently remove the mercury contaminated waste from the site providing long-term effectiveness and permanence.

6. Implementability

Alternative 3 has no technical or administrative implementability issues. Under Alternative 4 disposal of CMS area wastes may be limited based on capacity of surrounding disposal facilities. Care must be taken to prevent the release of asbestos during excavation, transportation, and interment associated with Alternatives 3 and 4. Under Alternative 4, administrative implementability issues include the need for off-site disposal approval by the TSDF and potential complications from material exhibiting elevated radiological readings which may protract identifying an appropriate out-of-state disposal facility. Alternatives 3 and 4 are favorable in that they are readily implementable.

7. Cost-Effectiveness

Alternative 3 costs $17,098,100 and is the most cost-effective alternative that provides protection of human health and environment and meets the other threshold and balancing criteria. Alternative 4 is projected to cost $35,021,800 and is the most cost prohibitive.

8. Land Use

When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy. Alternative 3 would comply with the reasonably anticipated, continued industrial use of the OU. Alternative 4 would result in unrestricted use of the OU, which could result in higher uses such as residential or commercial.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance

Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the proposed Statement of Basis are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the proposed remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 3 has been proposed for because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion**.**

APPENDIX A

ADMINISTRATIVE RECORD

Bethlehem Steel
(Tecumseh Redevelopment, Inc.)

OU-06 - Former Petroleum Bulk Storage Sub-Area
and
OU-07 - Coal, Coke and Ore Handling and Storage Sub-Area, and
Coke Plant and By-Products Facility Sub-Area

City of Lackawanna, Erie County
Site No. 915009
EPA ID No. NYD002134880

Documents

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC. Corrective Measures Study Report, Tecumseh Redevelopment Site, Lackawanna, New York, Revised May 2019.

URS Consultants, Inc. RCRA Facility Investigation (RFI) Report for the Former Bethlehem Steel Corporation Facility, Lackawanna, New York.
October 2004.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC. Corrective Measures Study Work Plan, Tecumseh Redevelopment Site, Lackawanna, New York. May 2009.

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering and Science, PLLC. Comprehensive Groundwater Quality Assessment Report (2014). Tecumseh Redevelopment CMS Area, Lackawanna, New York. May 2014.

New York's Great Lakes Basin: Interim Action Agenda, July 2014.

Designated Habitat: Smoke Creek Shoals, Coastal Fish and Wildlife Habitat, Department of State, Designated: October 15, 1987.

Niagara River AOC, Great Lakes Water Quality Agreement of 1987.

Returning to a Healthy Lake, An International Biodiversity Conservation Strategy for Lake Erie, binational initiative involving 87 agencies and organizations around the basin.

Great Lakes Coastal Resilience Planning Guide, collaborative effort of the NOAA Digital Coast partnership and additional community-based partners from the Great Lakes.

National Oceanic and Atmospheric Administration and the Coastal States Organization program to identify the most critical coastal habitat projects and data needs in each of the eight Great Lakes states, 2019.

DEC's Great Lakes Program, including Great Lakes Regional Collaboration Strategy, Be Green in the Great Lakes Project, Great Lakes Action Agenda, and Lake-wide Action and Management Plans, ongoing initiatives.

City of Lackawanna Comprehensive Plan Update, July 6. 2016.

USEPA, Corrective Action Management Units (CAMUs) and Temporary Units (TUs), promulgated on February 16, 1993. EPA amended the 1993 CAMU rule in 2002.

City of Lackawanna, Local Waterfront Revitalization Program, Preliminary Draft May 2018.

US Army Corps of Engineers, Project Modifications for Improvement of the Environment, Section 1135 of the 1986 Water Resources Development Act, as amended (P.L. 99-662), Scoping Information, May 7, 2013.

2010. DER-10 Technical Guidance for Site Investigation and Remediation.

U.S. Environmental Protection Agency (EPA). 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA l540lG-891004).

A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA 542-F-96-007. EPA Office of Solid Waste and Emergency Response. April 1996.

New York State Department of Environmental Conservation, Order on Consent – File No. 03-73: Corrective Measures Study, June 2009.

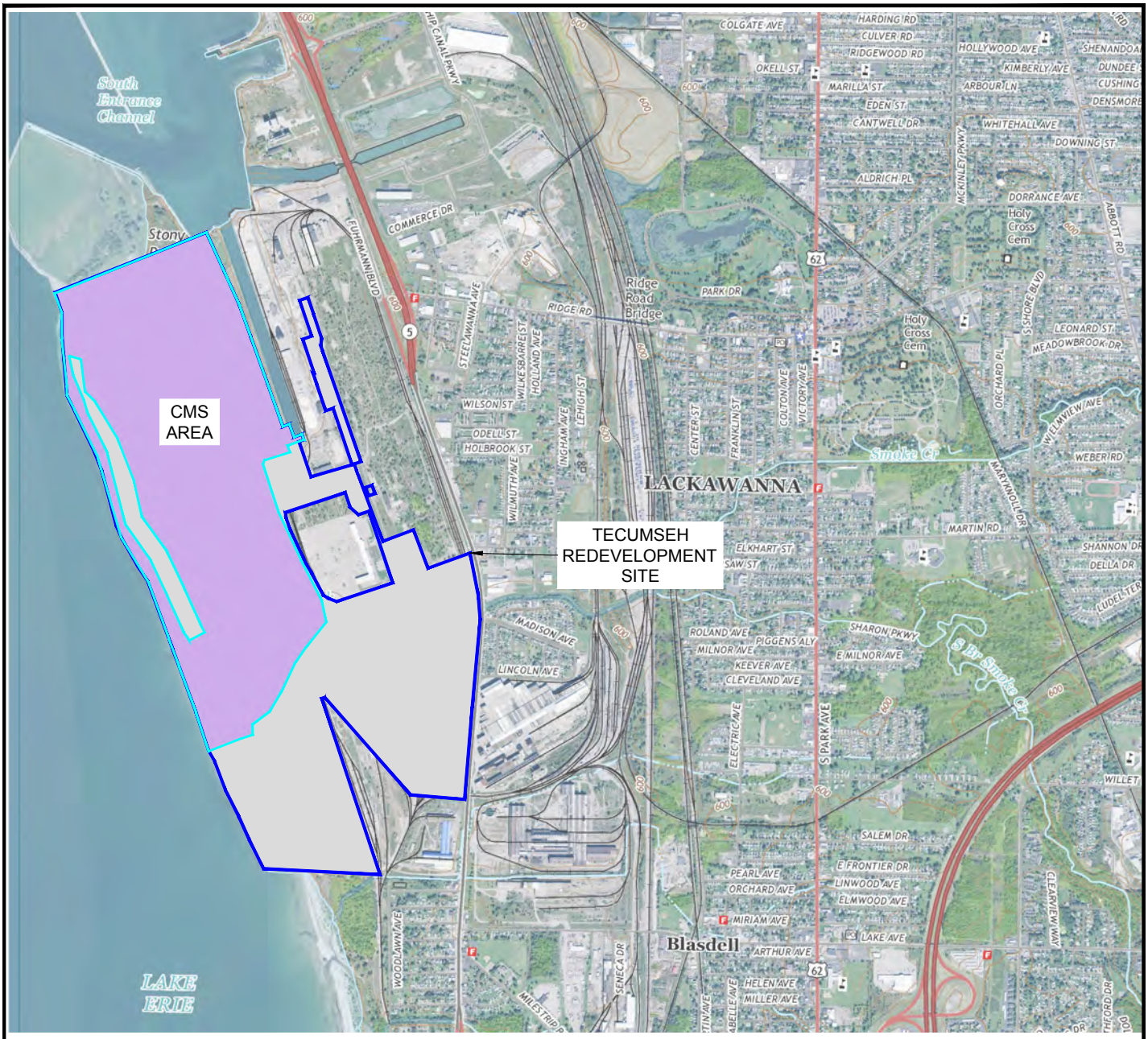
September 24, 2020 the Department and Tecumseh signed an Order on Consent (the “Order”) to complete comprehensive investigation; evaluation; and implementation of Corrective Measures/Remedial Actions, Closure and Post-Closure Care requirements of the Site to protect public health and the environment and to allow, when and where appropriate, the continued use of the Site and its redevelopment by Tecumseh and/or third parties.

New York State Department of Environmental Conservation, Proposed Statement of Basis Corrective Measures Selection: Bethlehem Steel Operable Units One (OU-01) Sitewide Remedial Elements, Operable Unit Nine (OU-09) Water Courses, and Operable

Unit 10 (OU-10) Sitewide Groundwater, Site No. 915009, EPA ID No. NYD002134880, Lackawanna, Erie County, May 5, 2021.

New York State Department of Environmental Conservation, Proposed Statement of Basis Proposed Remedy Operable Unit Five (OU-05) Slag Fill Zone 2 and OU08: Slag Fill Area - Zones 4 and 5 SWMU/AOC Group, Site No. 915009, EPA ID No. NYD002134880, Lackawanna, Erie County, May 5, 2021.

New York State Department of Environmental Conservation, Proposed Statement of Basis Proposed Remedy OU-06 Former Petroleum Bulk Storage Sub-Area and OU-07 Coal, Coke and Ore Handling and Storage Sub-Area, and Coke Plant and By-Products Facility Sub-Area, Site No. 915009, EPA ID No. NYD002134880, Lackawanna, Erie County, May 5, 2021.



TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

FIGURE 1

SITE LOCATION MAP

CMS AREA - FORMER BETHLEHEM STEEL SITE

LACKAWANNA, NEW YORK

PROJECT NO.: 0071-019-111

DATE: MAY 2019

DRAFTED BY: RFL

DISCLAIMER:
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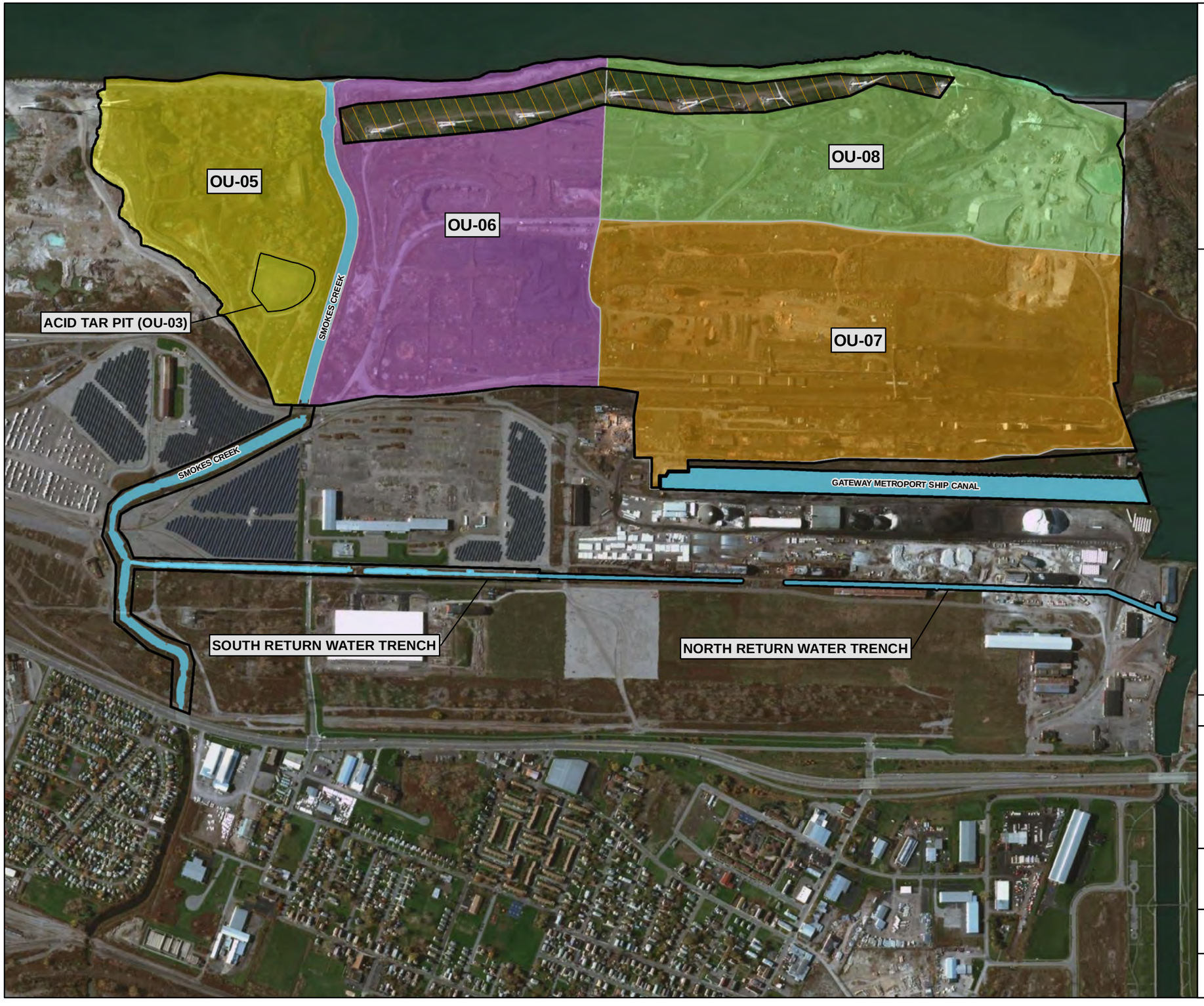


LEGEND

- CMS Boundary (OU-01 & OU-10)
- Steel Winds Boundary
- OU-05
- OU-06
- OU-07
- OU-08
- OU-9 Boundaries

Notes:

Extents of North and South Return Water Trenches are shown larger than actual size to increase visibility at the current scale

0 500 1,000 2,000 Feet

Figure 2

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Bethlehem Steel Operable Units

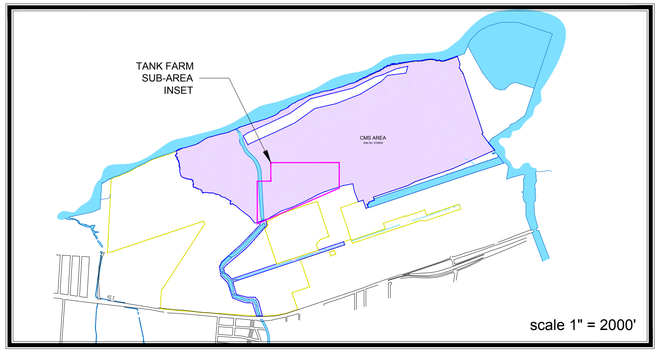
Tecumseh Redevelopment Site
Lackawanna, New York

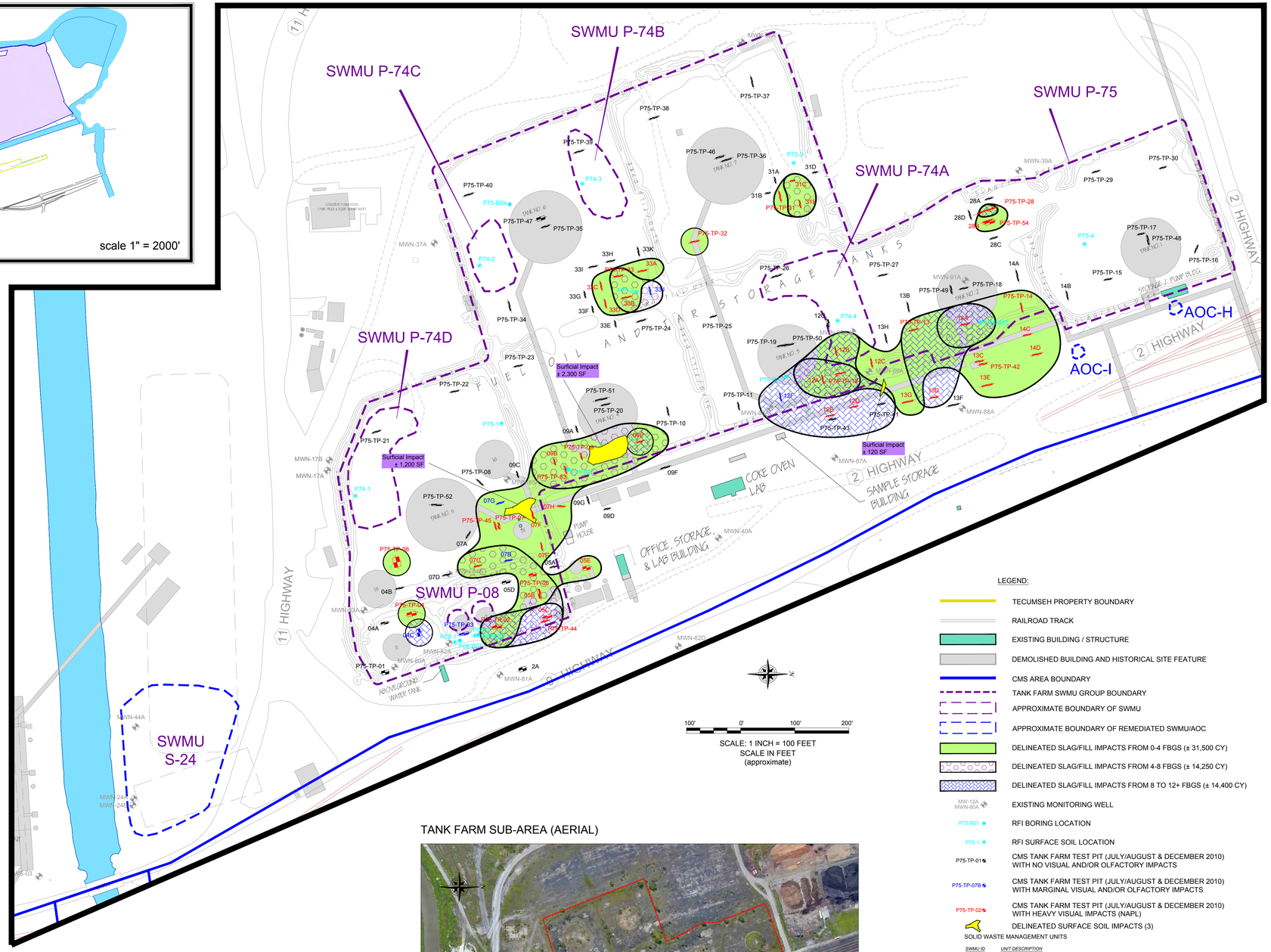
PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

Plotted By: Sisson, Evan

Plot Date: 3/5/2021

Document Path: E:\C Drive\p005664b\NYSDEC Tecumseh\MXDs\NYSDEC Tecumseh OUs.mxd





SITE PLAN:

TANK FARM SUB-AREA SWMUs & AOCs

P75-TP-31 (looking north)

P75-TP-28B showing LNAPL-impacted slag

TANK FARM SUB-AREA (AERIAL)

BASE IMAGE GOOGLE EARTH MAY 2017

LEGEND:

🟨	TECUMSEH PROPERTY BOUNDARY
═	RAILROAD TRACK
🟩	EXISTING BUILDING / STRUCTURE
⬜	DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
━	CMS AREA BOUNDARY
╌	TANK FARM SWMU GROUP BOUNDARY
⬚	APPROXIMATE BOUNDARY OF SWMU
⬚	APPROXIMATE BOUNDARY OF REMEDIATED SWMU/AOC
🟩	DELINEATED SLAG/FILL IMPACTS FROM 0-4 FBGS (± 31,500 CY)
⬡	DELINEATED SLAG/FILL IMPACTS FROM 4-8 FBGS (± 14,250 CY)
▨	DELINEATED SLAG/FILL IMPACTS FROM 8 TO 12+ FBGS (± 14,400 CY)
MW-12A MWN-80A ⌖	EXISTING MONITORING WELL
P75-B01 ●	RFI BORING LOCATION
P75-1 ◉	RFI SURFACE SOIL LOCATION
P75-TP-01 ▪	CMS TANK FARM TEST PIT (JULY/AUGUST & DECEMBER 2010) WITH NO VISUAL AND/OR OLFACTORY IMPACTS
P75-TP-07B ▪	CMS TANK FARM TEST PIT (JULY/AUGUST & DECEMBER 2010) WITH MARGINAL VISUAL AND/OR OLFACTORY IMPACTS
P75-TP-02 ▪	CMS TANK FARM TEST PIT (JULY/AUGUST & DECEMBER 2010) WITH HEAVY VISUAL IMPACTS (NAPL)
🟨	DELINEATED SURFACE SOIL IMPACTS (3)

SOLID WASTE MANAGEMENT UNITS

SWMU ID	*UNIT DESCRIPTION*
P-08	Waste Oil Storage Tanks [in Tank Farm]
P-74 (A, B, C, D)	[Solid Fuel Mix Storage Piles in Tank Farm]
P-75	Tank Storage Area for No. 6 Fuel Oil and Petroleum Tar [Tank Farm]

NOTES:

1. Building locations are based on historical surveys and maps, all locations should be considered approximate.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY:	RFL
DATE:	APRIL 2019
CHECKED BY:	PHW
APPROVED BY:	PHW

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TANK FARM SUB-AREA SWMUs P-8, -74, & -75 & AOCs-H & I SAMPLE LOCATIONS, PETROLEUM-IMPACT DELINEATION, & REMEDIATED AREAS

CMS REPORT

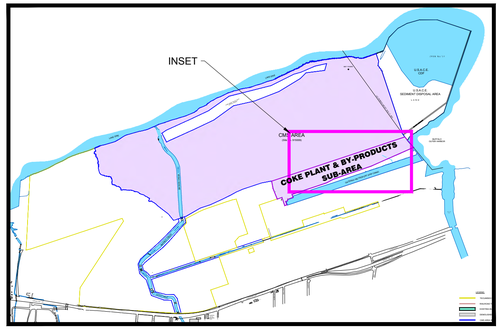
CMS AREA - FORMER BETHLEHEM STEEL SITE

LACKAWANNA, NEW YORK

PREPARED FOR

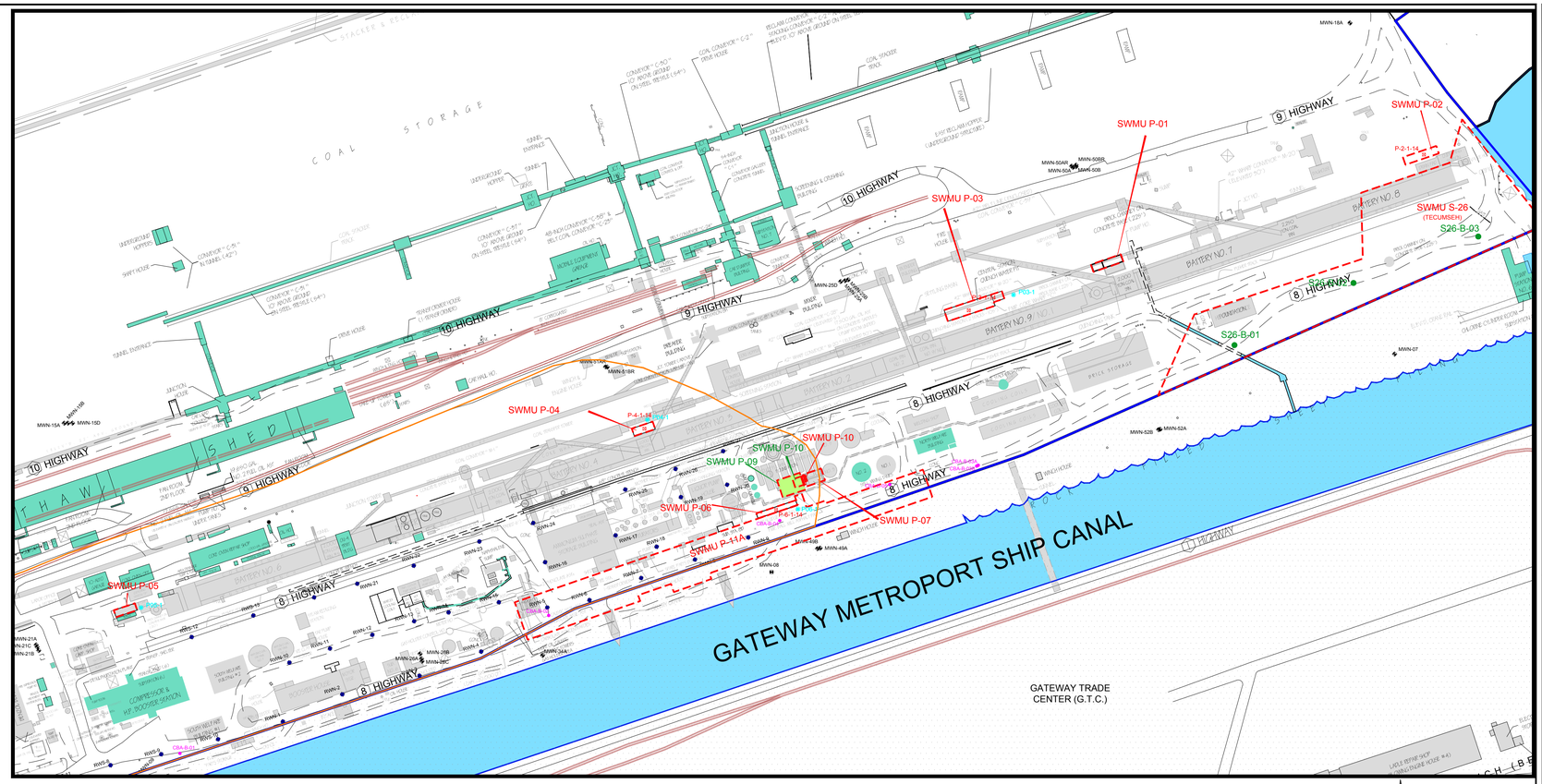
TECUMSEH REDEVELOPMENT INC.

FIGURE 3



LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- RAILROAD TRACK
- EXISTING BUILDING / STRUCTURE
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- CMS AREA BOUNDARY
- OU-4 BOUNDARY
- APPROXIMATE BOUNDARY OF SWMU
- APPROXIMATE BOUNDARY OF AOC
- APPROXIMATE BOUNDARY OF REMEDIATED SWMU
- RWN-21 — OU-4 GROUNDWATER RECOVERY WELL
- CBA-B-02 — BORING LOCATION
- MWN-15A — EXISTING MONITORING WELL LOCATION
- P-4-1-14 — SWMU P-1 TO P-6 IMPOUNDED WATER SAMPLE LOCATION
- P-5-1-14 — SWMU P1 AND P5 SOLID RESIDUAL SAMPLE LOCATION
- SB-09 — RFI BORING
- P04-1 — RFI SURFACE SAMPLE
- COKE PLANT & BY-PRODUCTS SUB-AREA BOUNDARY



SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

COKE PLANT & BY-PRODUCTS SUB-AREA

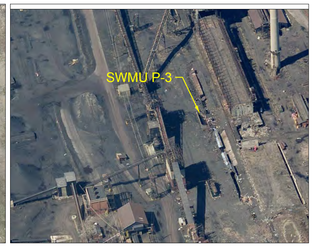
(AERIAL GOOGLE EARTH MAY 2017)

REPRESENTATIVE PHOTOGRAPHS:

SWMU P-1 (looking east)

SWMU P-2 (looking north)

SWMU P-3 (looking north)



SOURCE FOR AERIAL IMAGES FOR P-1 THRU P-6 FROM BING MAPS CIRCA 2010

SWMU P-4 (looking north)

SWMU P-5 (looking south)

SWMU P-6 (looking west)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
IN ASSOCIATION WITH
TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599
JOB NO.: 007I-019-111

REVISIONS

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DATE: APRIL 2019
CHECKED BY: LR
APPROVED BY: PHW

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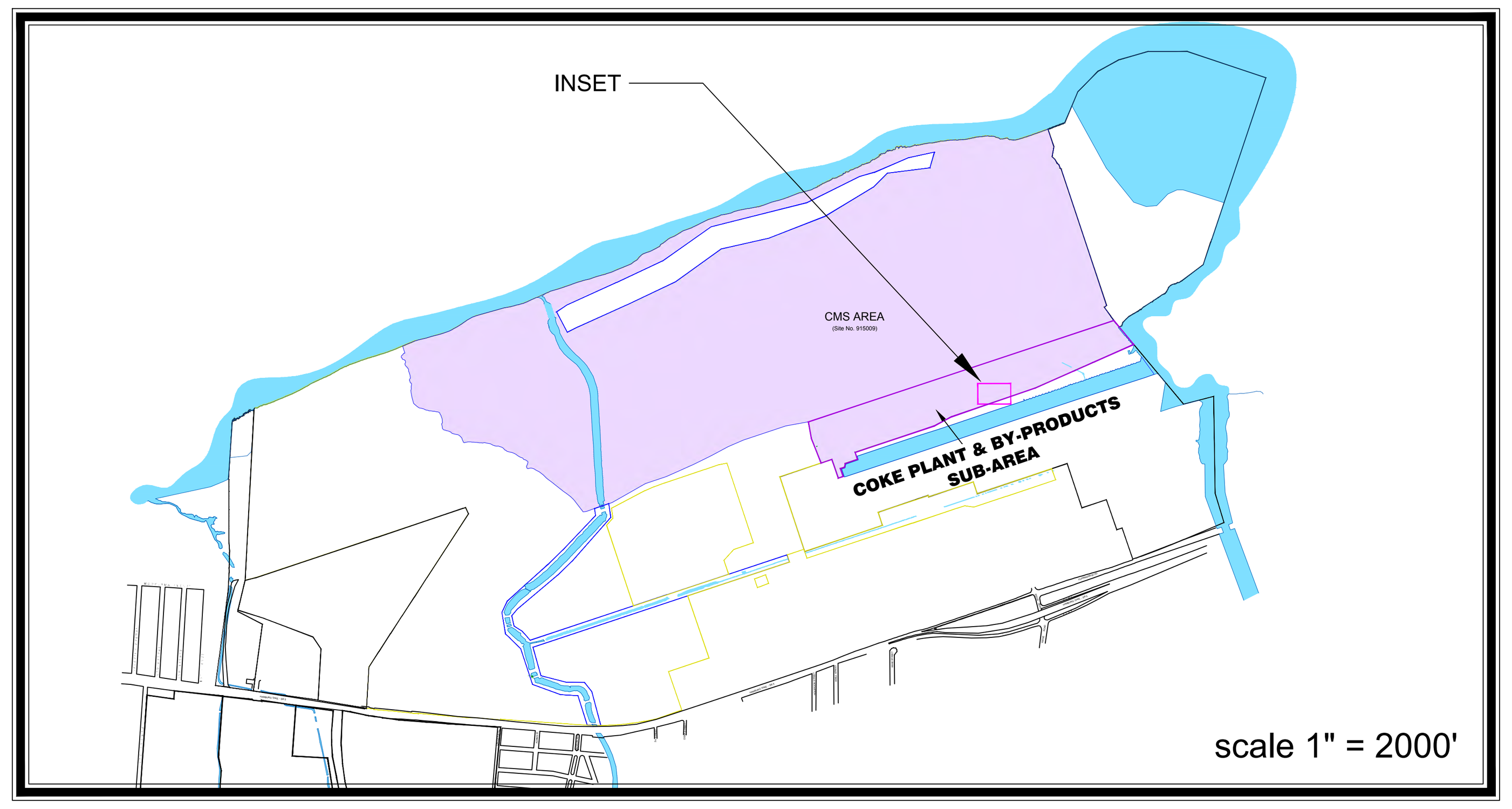
COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA
SWMUs P-1 THRU P-6 & P-11A SAMPLE LOCATIONS
CMS REPORT
CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

PREPARED FOR:
TECUMSEH REDEVELOPMENT INC.

FIGURE 4

SITE PLAN:

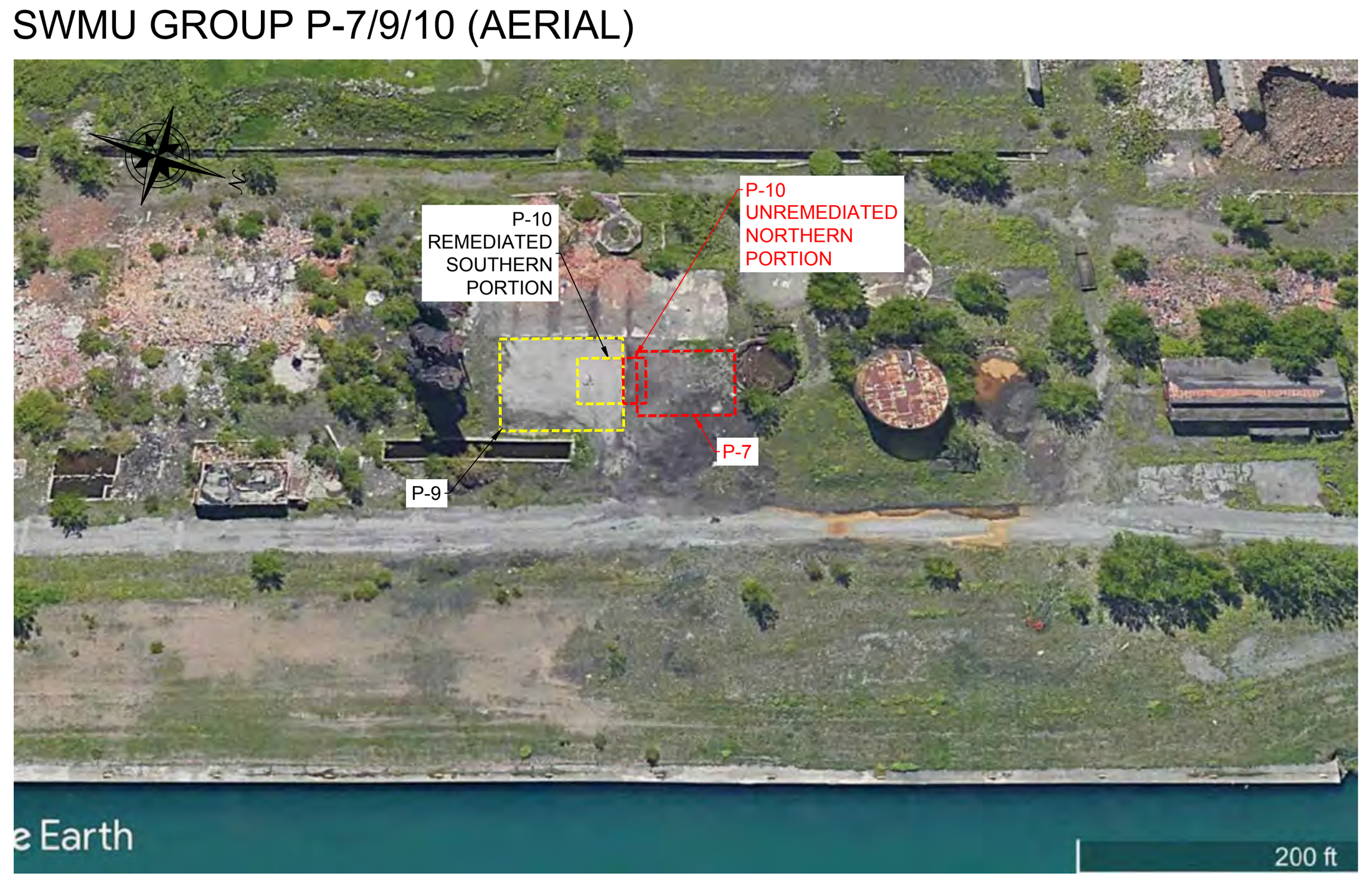


REPRESENTATIVE PHOTOGRAPHS:

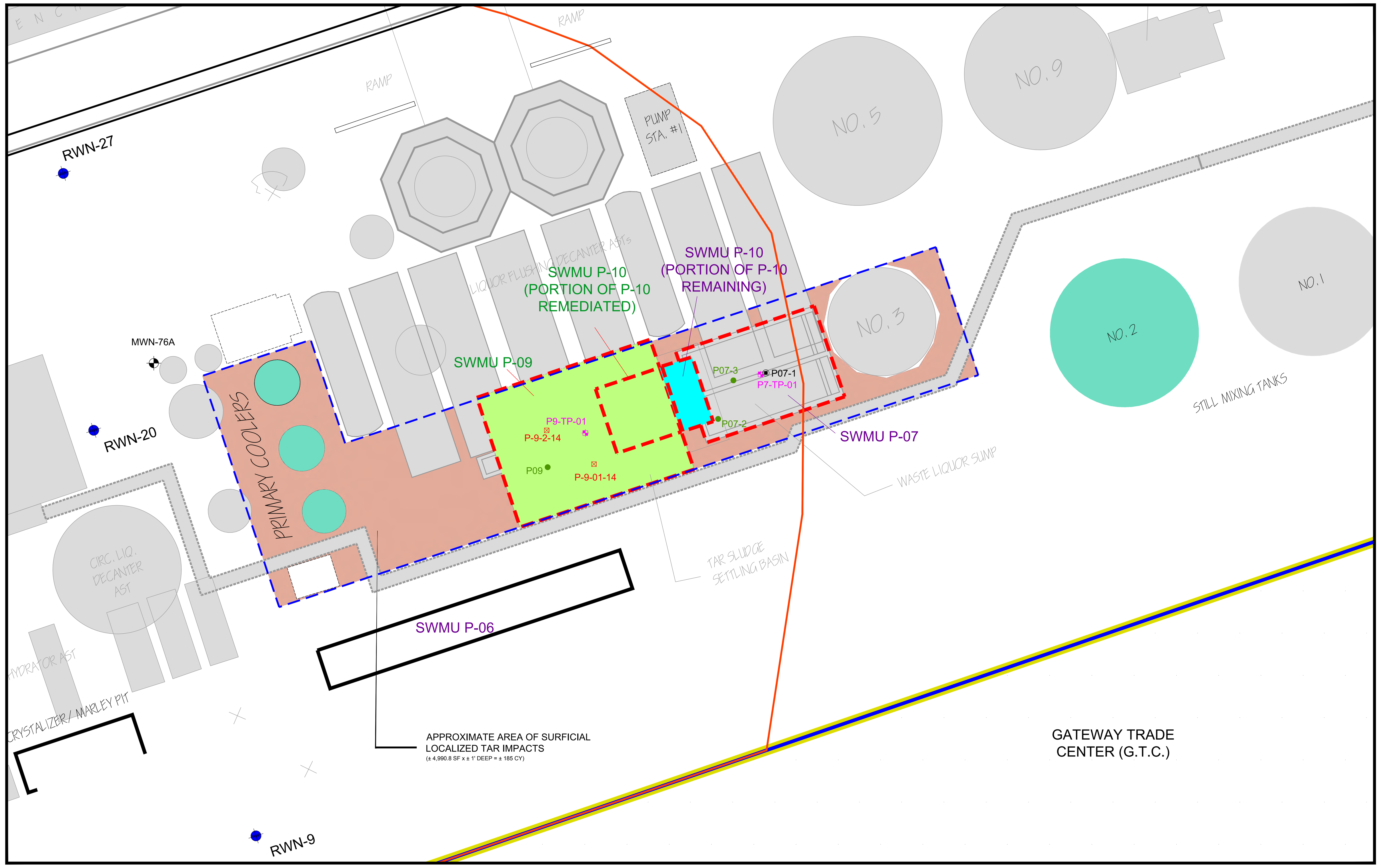
OPERABLE UNIT 4 (AERIAL)

AERIAL IMAGES FROM GOOGLE EARTH MAY 2017

SWMU GROUP P-7/9/10 (AERIAL)



SWMUs P-7, P-9, & P-10



20' 0' 20' 40'

SCALE: 1 INCH = 20 FEET
SCALE IN FEET
(approximate)

SWMU P-9 & PORTION OF P-10; LEFT: EXCAVATED TAR DECANTER PIT (P-9);
RIGHT: BACKFILLED PIT AND AREA FINAL GRADED (PICTURES FROM 2015)

LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- EXISTING BUILDING / STRUCTURE
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- CMS AREA BOUNDARY
- OPERABLE UNIT 4 BOUNDARY
- SWMU BOUNDARY REQUIRING ADDITIONAL ACTION
- REMEDIATED SWMU
- PORTION OF SWMU P-10 REQUIRING ACTION
- APPROXIMATE LIMITS OF SURFICAL TAR IMPACTS
- MWN-15A EXISTING MONITORING WELL
- P7-TP-01 CMS TEST PIT LOCATION (2011)
- P-9-2-14 CMS TEST BORING LOCATION (2014)
- SB-09 RFI BORING
- SS-03 RFI SURFACE SAMPLE
- RWN-20 OU-4 GROUNDWATER RECOVERY WELL
- RW-E BENZOL YARD RECOVERY WELL (12)
- COAL/COKE/ORE STORAGE & COAL HANDLING SUB-AREA BOUNDARY

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

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COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA
SWMUs P-7, -9, & -10 SAMPLE LOCATIONS

CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE

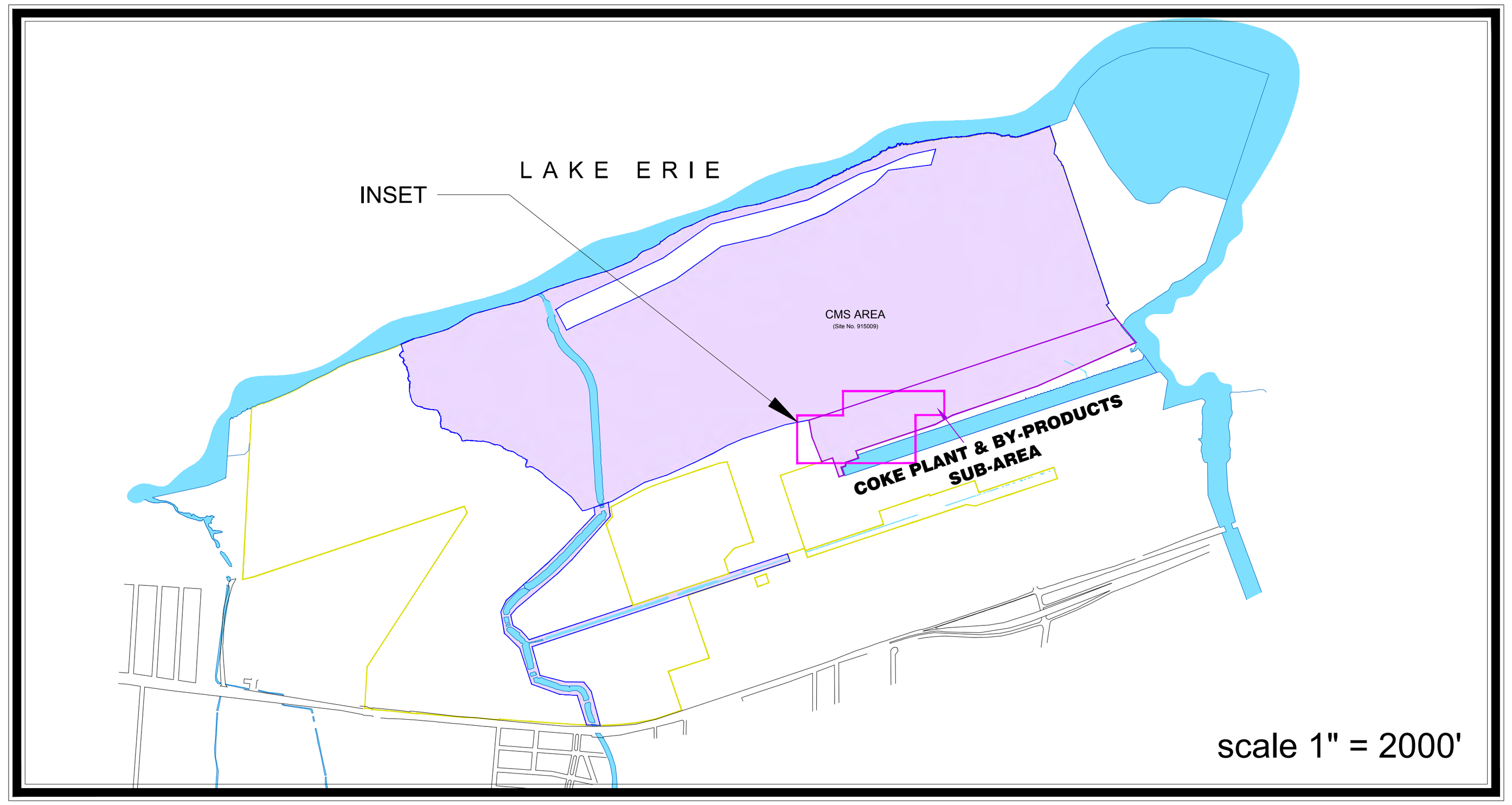
LACKAWANNA, NEW YORK

PREPARED FOR

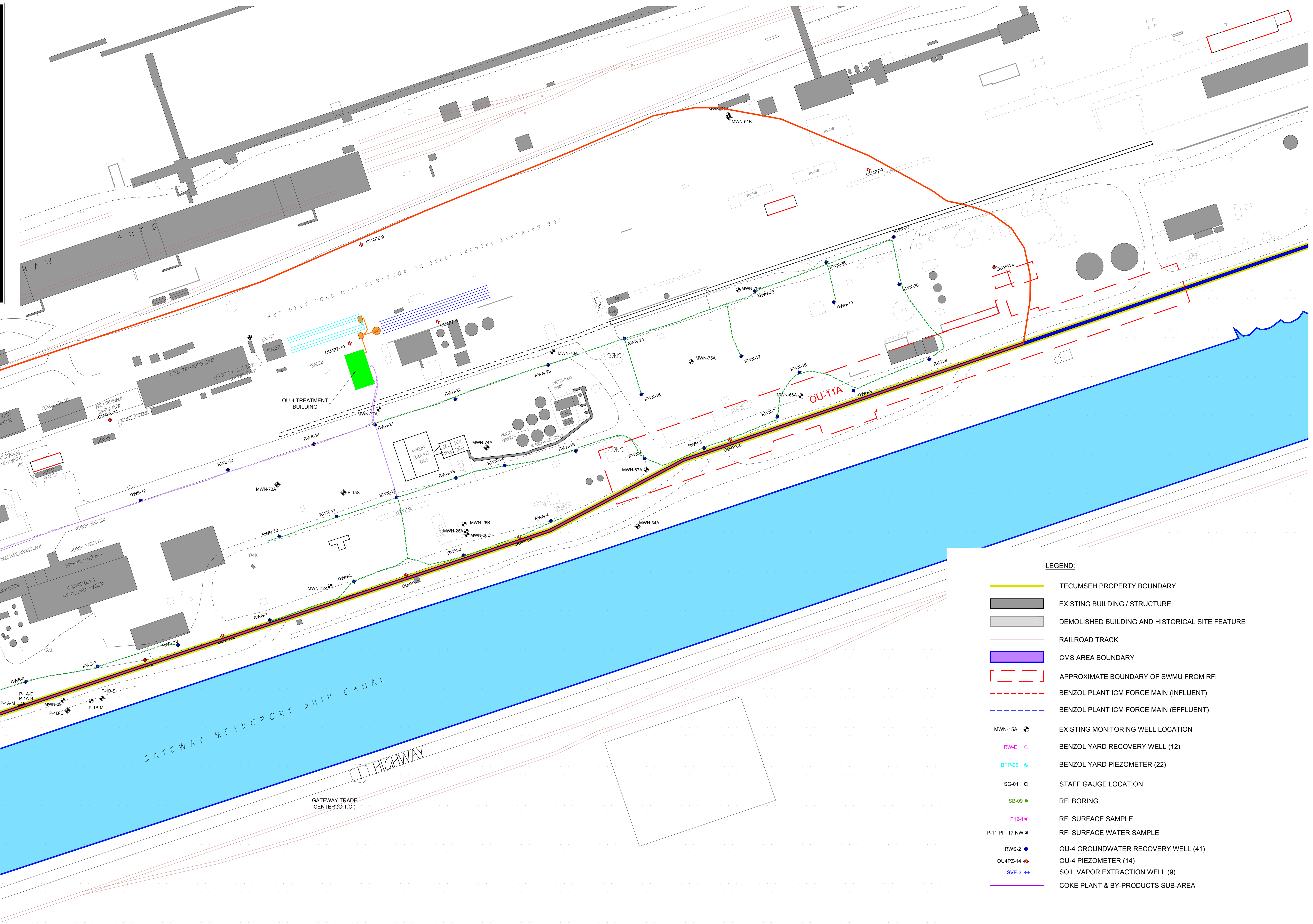
TECUMSEH REDEVELOPMENT INC.

FIGURE 5

SITE PLAN:



SWMUs P-11 & P-12

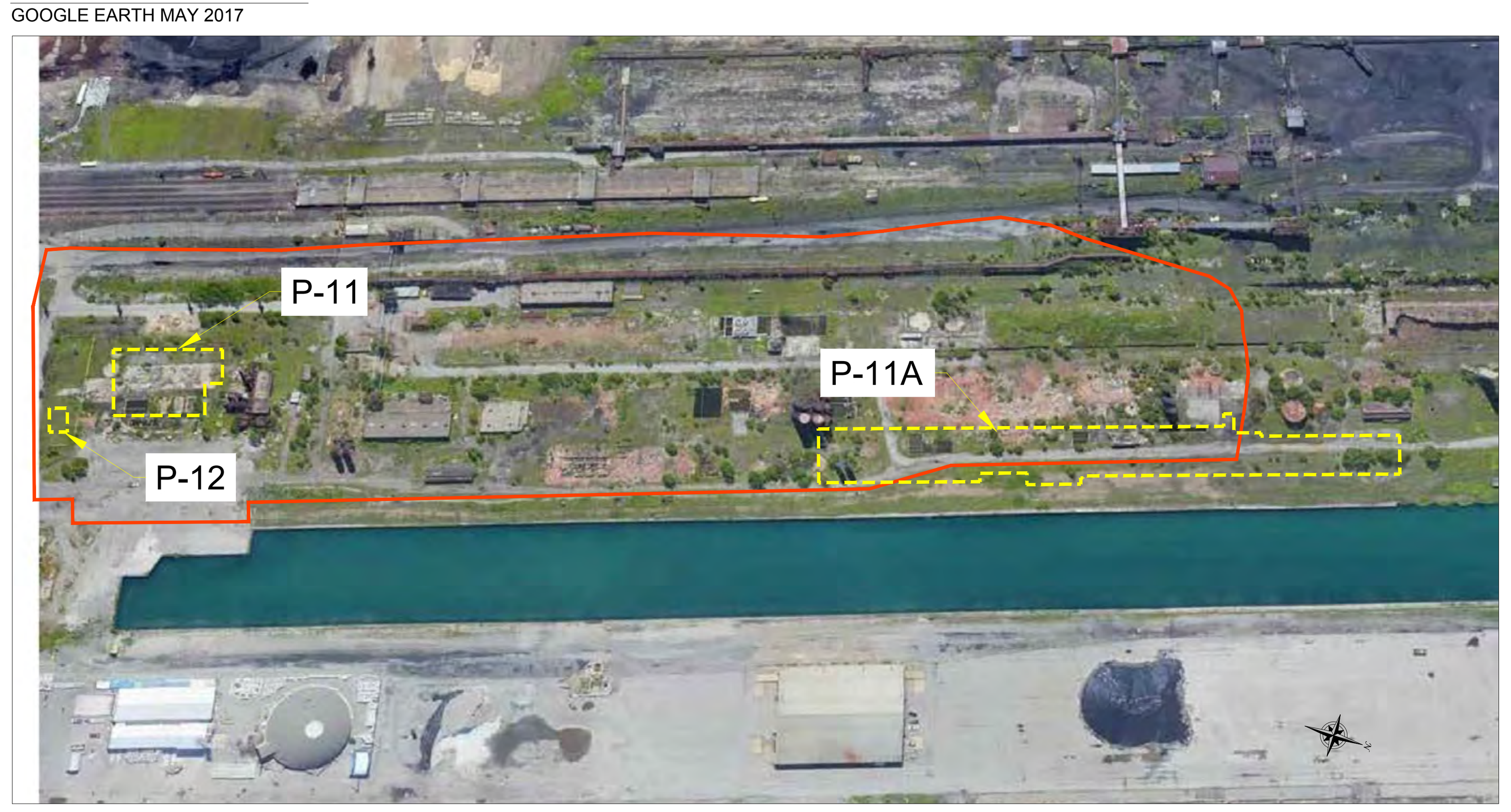


LEGEND:

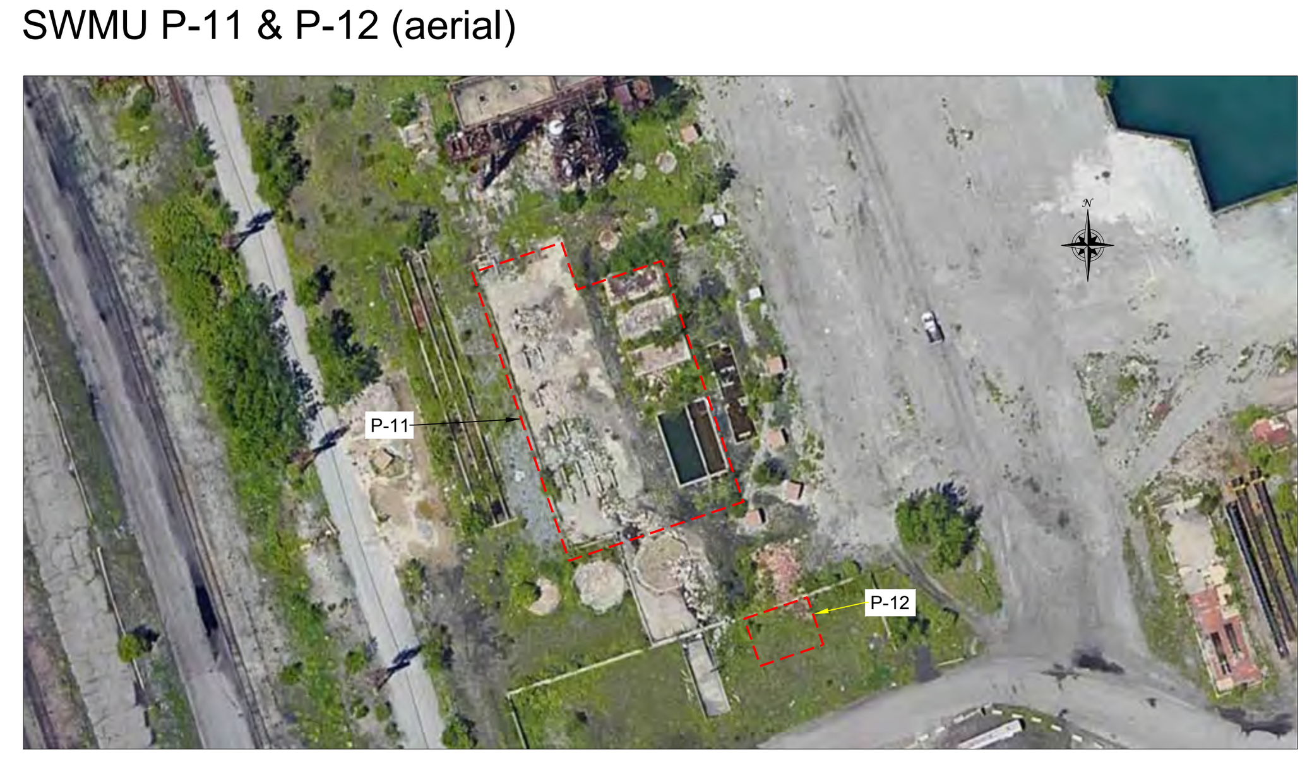
Symbol	Description
	TECUMSEH PROPERTY BOUNDARY
	EXISTING BUILDING / STRUCTURE
	DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
	RAILROAD TRACK
	CMS AREA BOUNDARY
	APPROXIMATE BOUNDARY OF SWMU FROM RFI
	BENZOL PLANT ICM FORCE MAIN (INFLUENT)
	BENZOL PLANT ICM FORCE MAIN (EFFLUENT)
MWN-15A	EXISTING MONITORING WELL LOCATION
RW-E	BENZOL YARD RECOVERY WELL (12)
BPP-05	BENZOL YARD PIEZOMETER (22)
SG-01	STAFF GAUGE LOCATION
SB-09	RFI BORING
P12-1	RFI SURFACE SAMPLE
P-11 PIT 17 NW	RFI SURFACE WATER SAMPLE
RWS-2	OU-4 GROUNDWATER RECOVERY WELL (41)
OU4PZ-14	OU-4 PIEZOMETER (14)
SVE-3	SOIL VAPOR EXTRACTION WELL (9)
	COKE PLANT & BY-PRODUCTS SUB-AREA

OPERABLE UNIT 4

GOOGLE EARTH MAY 2017



SWMU P-11 & P-12 (aerial)



100' 0' 100' 200'

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

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COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA SWMUs P-11 & P-12

BORING, MONITORING WELL, AND ICM COMPONENT LOCATIONS

CORRECTIVE MEASURES STUDY REPORT (2014)

CMS AREA - FORMER BETHLEHEM STEEL SITE

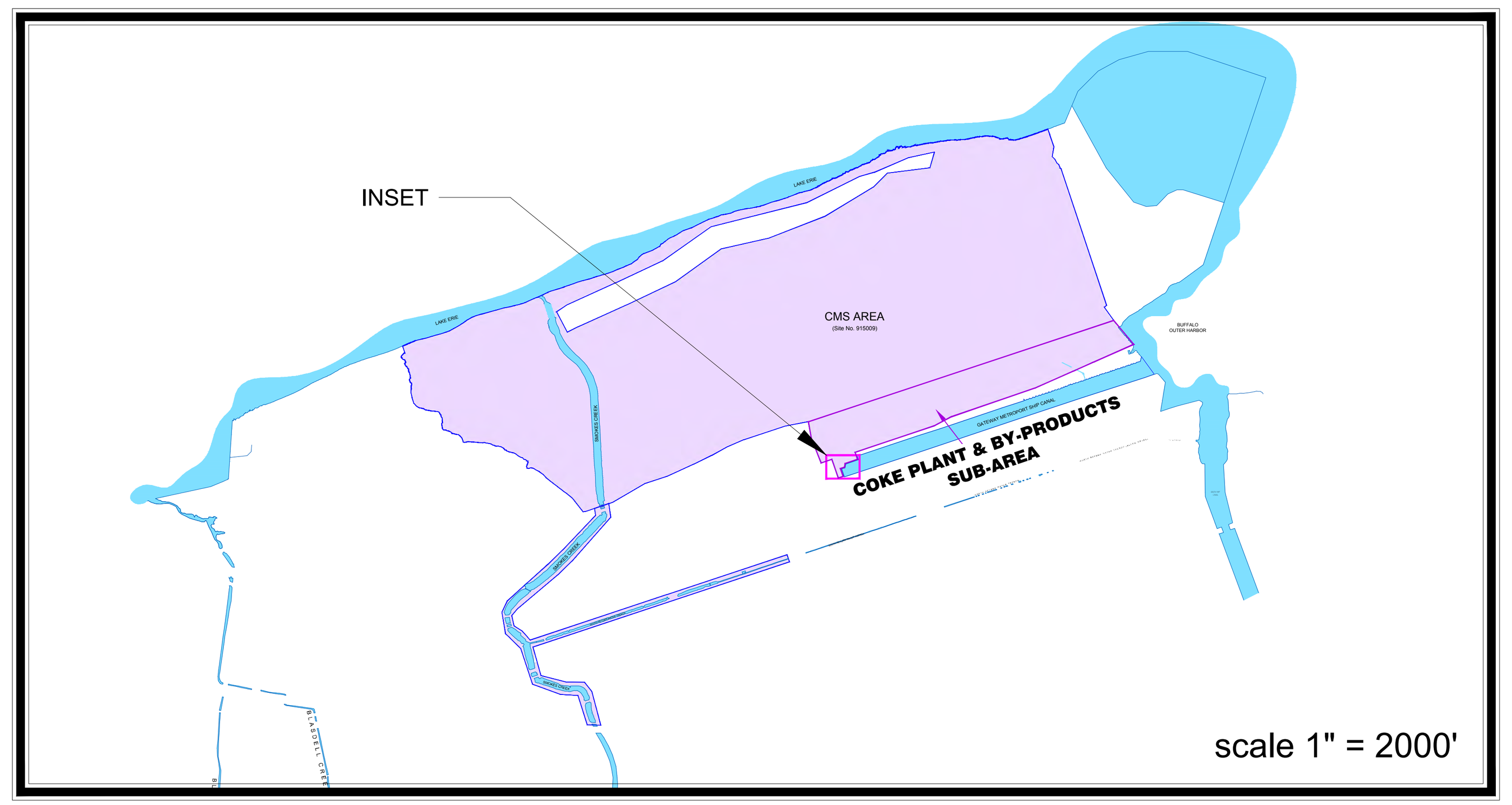
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 6

SITE PLAN:



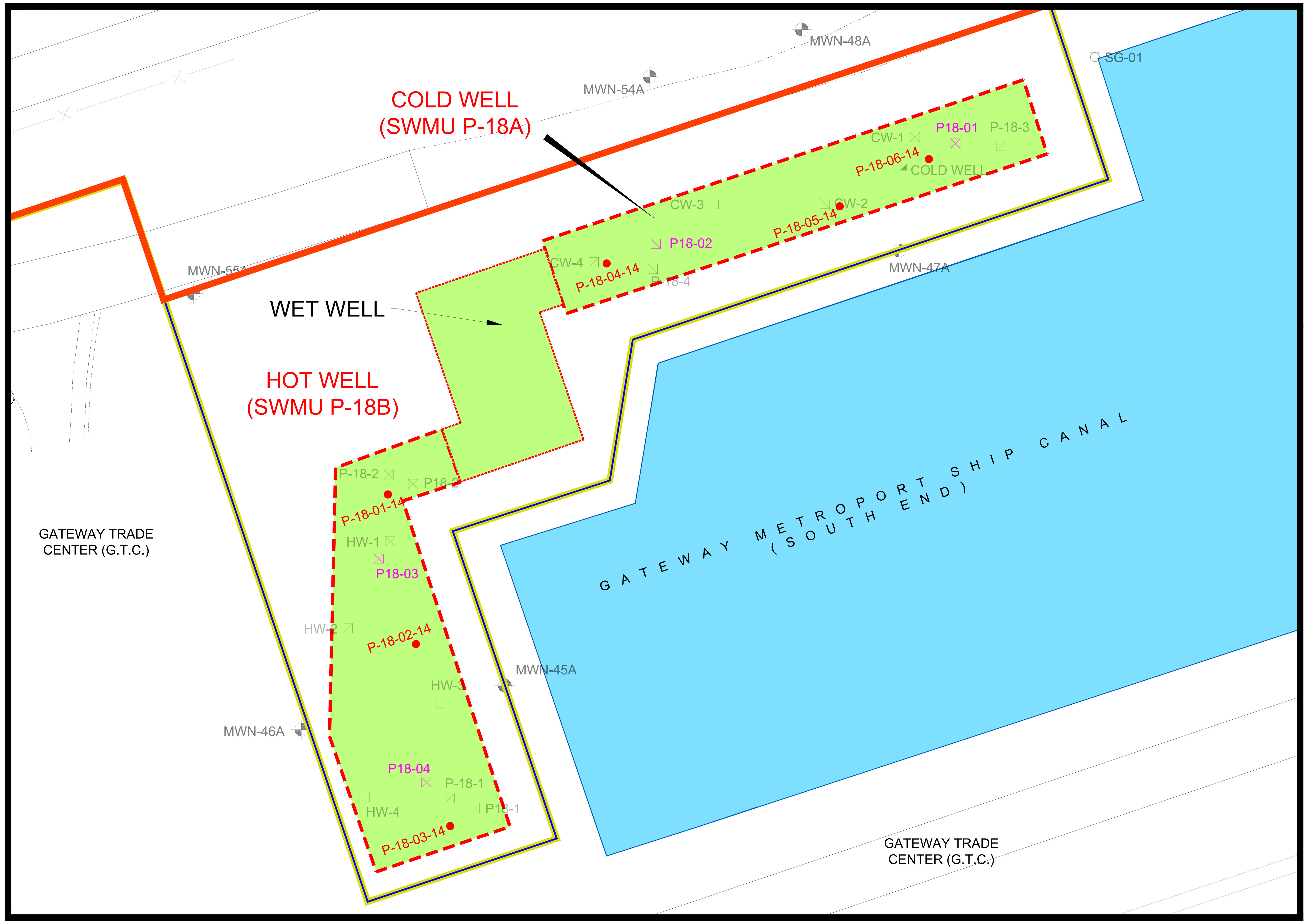
LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- RAILROAD TRACK
- CMS AREA BOUNDARY
- SWMU BOUNDARY
- OU-4 BOUNDARY
- MWN-15A — EXISTING MONITORING WELL LOCATION
- SG-01 — STAFF GAUGE LOCATION
- P-11 PIT 17 NW — RFI SURFACE WATER SAMPLE
- P18-01 — CMS RESIDUAL SAMPLE (2009)
- P-18-01-14 — CMS BORING LOCATION (2014)
- COKE PLANT & BY-PRODUCTS SUB-AREA

30' 0' 30' 60'

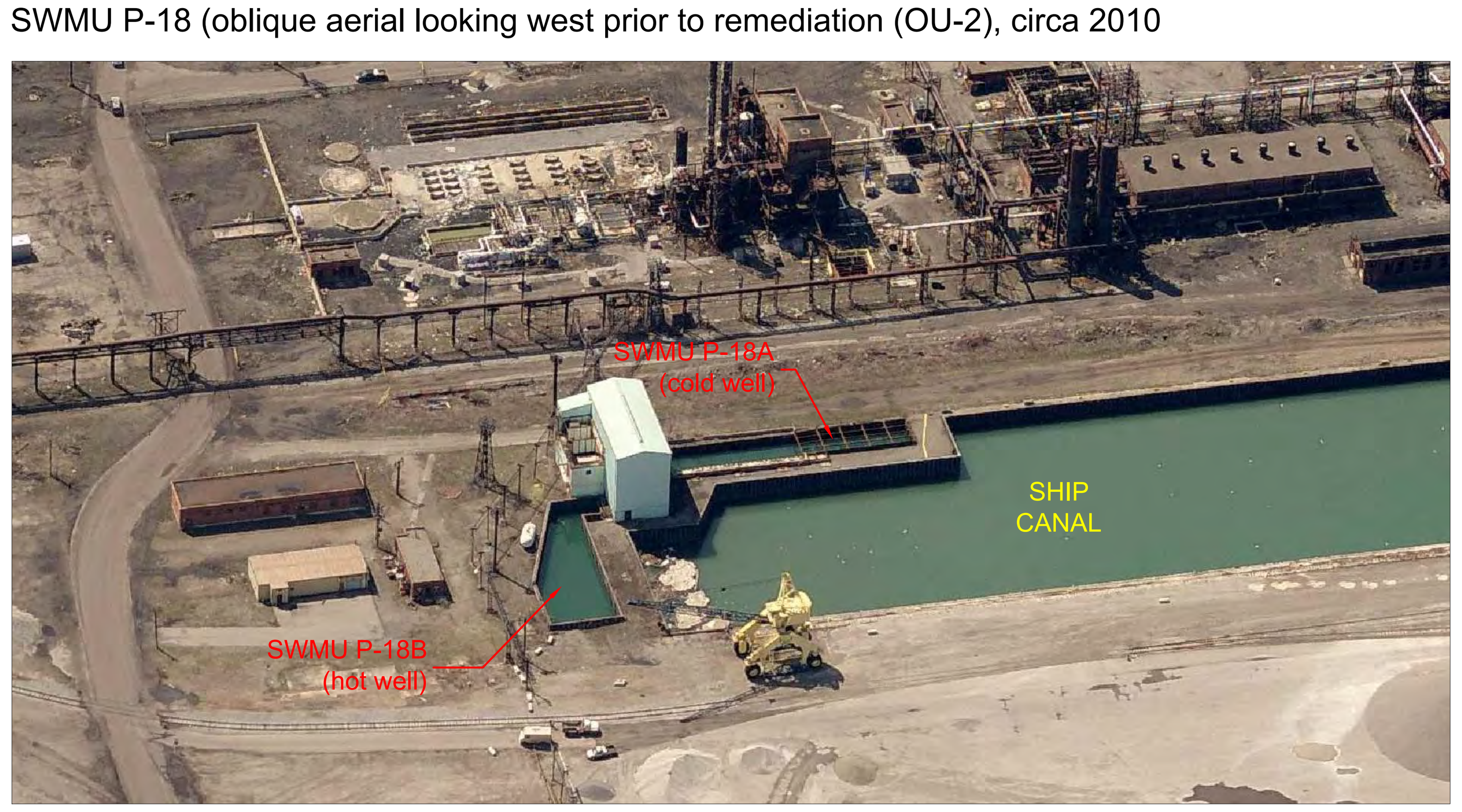
SCALE: 1 INCH = 30 FEET
SCALE IN FEET
(approximate)

SWMU P-18

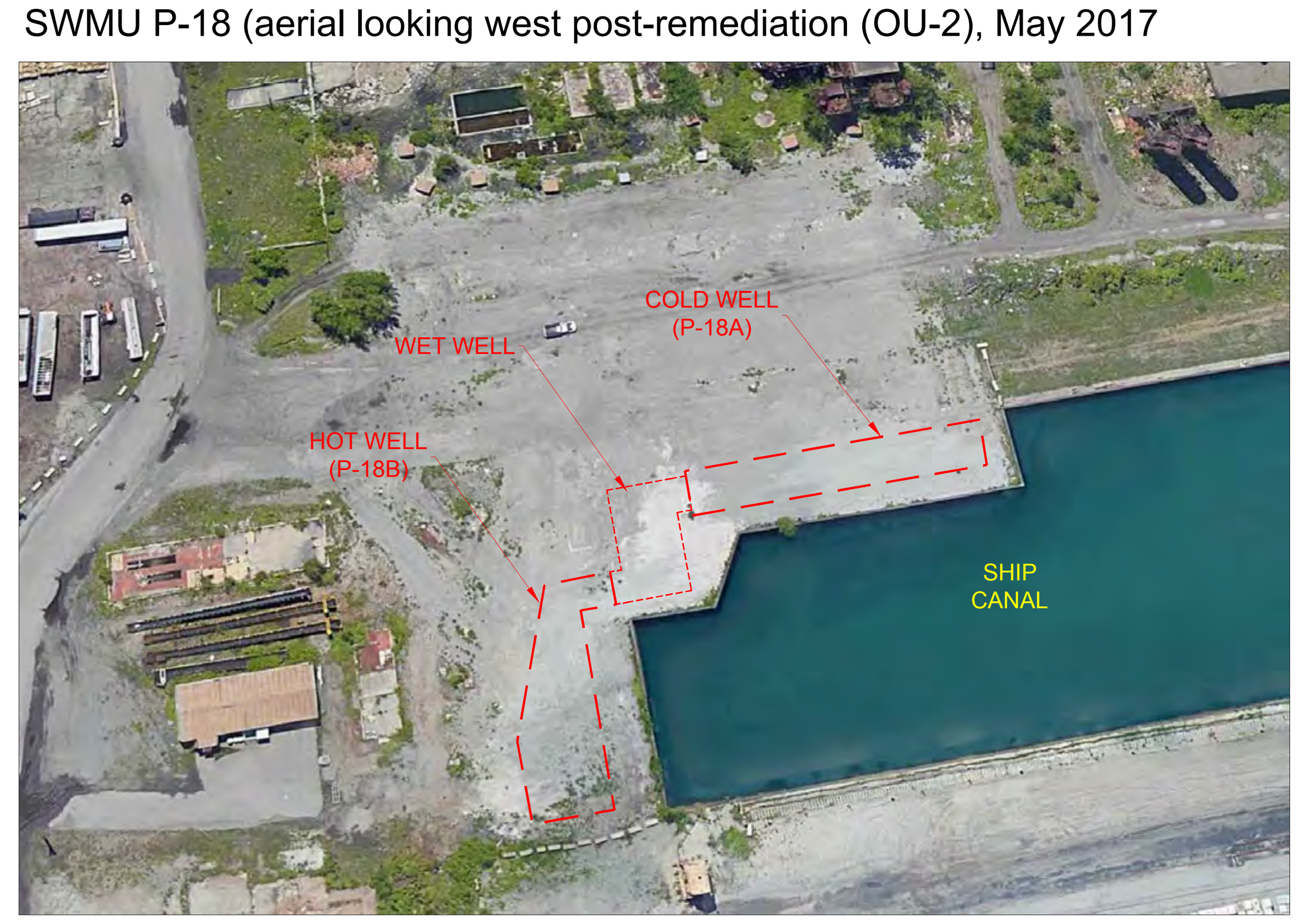


REPRESENTATIVE PHOTOGRAPHS:

SWMU P-18 (oblique aerial looking west prior to remediation (OU-2), circa 2010



SWMU P-18 (aerial looking west post-remediation (OU-2), May 2017



DREDGING COLD WELL (looking north (OU-2), 2015

DREDGE MATERIAL DEWATERING (OU-2, 2015)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

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DATE: APRIL 2019
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APPROVED BY: PHW

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COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA
SWMU P-18 (A & B) SAMPLE LOCATIONS

CMS REPORT

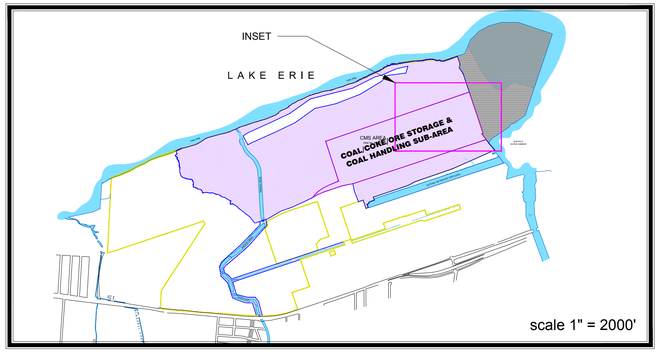
CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 7

F:\CAD\Turnkey\Tecumseh Redevelopment\CAD\2019\CMS Report\Plates\PLATE 8 & 9 COAL, COKE ORE HANDLING & STORAGE SUB AREA, SWMUs S-19 AND -25 SAMPLE LOCATIONS 2019.dwg

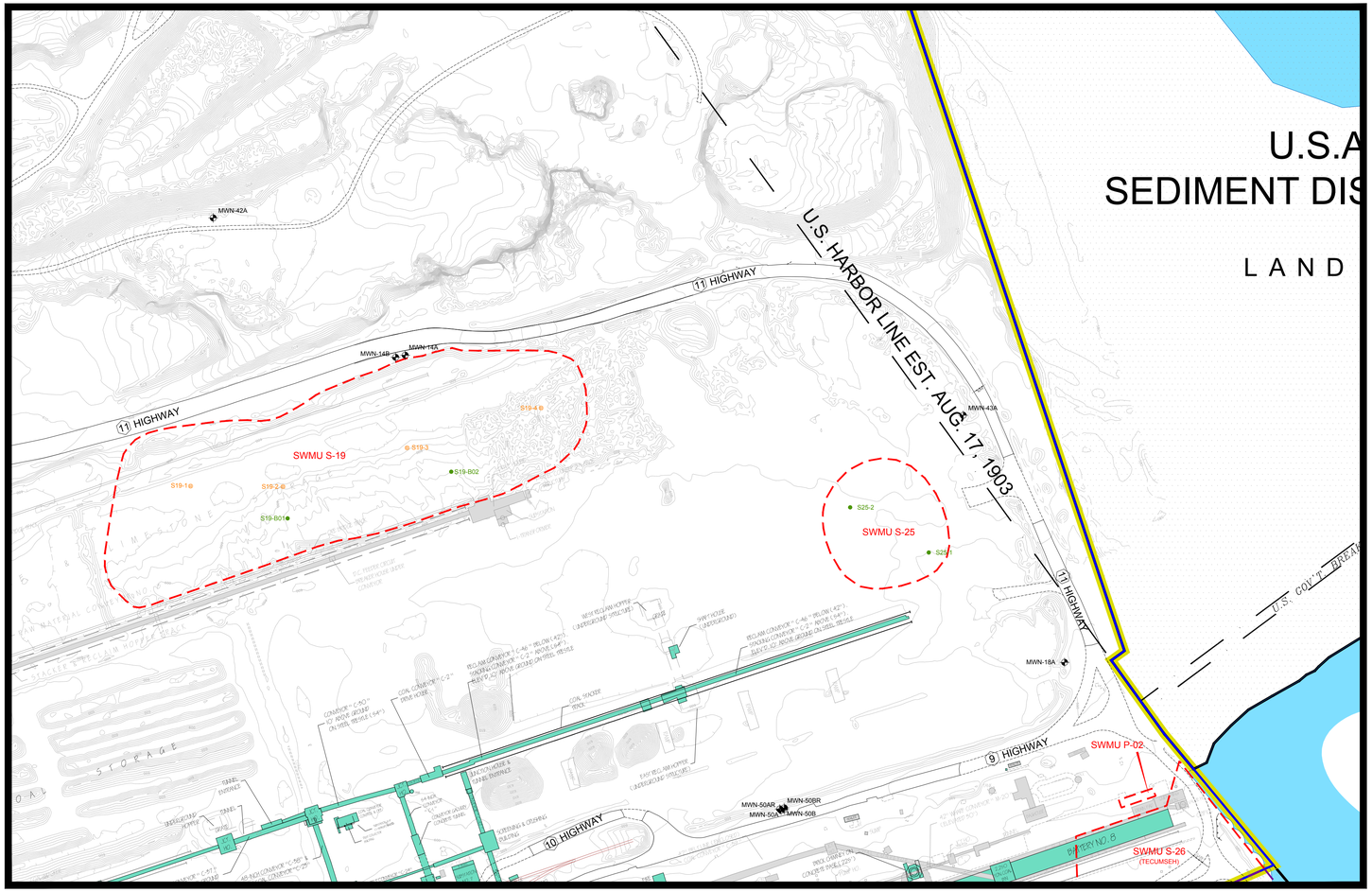
SITE PLAN:



LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- EXISTING BUILDING / STRUCTURE
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- RAILROAD TRACK
- CMS AREA BOUNDARY
- MWN-15A — EXISTING MONITORING WELL LOCATION
- SB-09 — RFI BORING
- S01-1 — RFI WASTE SAMPLE
- COAL/COKE/ORE STORAGE & COAL HANDLING SUB-AREA BOUNDARY

SWMUs S-19 & S-25:



SWMUs S-19 & S-25 (AERIAL)

IMAGES FROM GOOGLE EARTH MAY 2017

SWMU S-19

SWMU S-25

N

150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

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SEAL

COAL/COKE/ORE HANDLING & STORAGE SUB-AREA SWMUs S-19 & -25 SAMPLE LOCATIONS

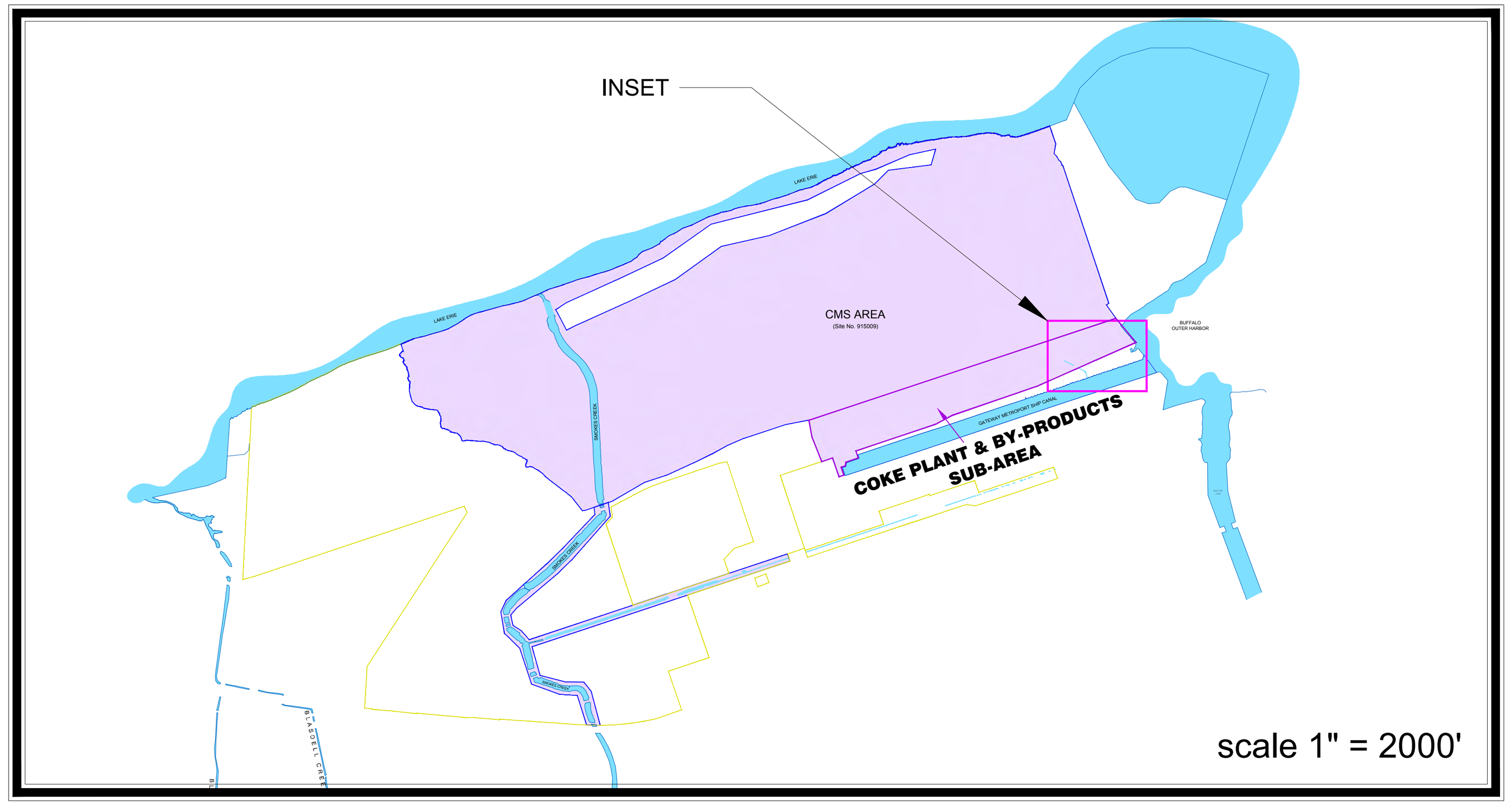
CMS REPORT

CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

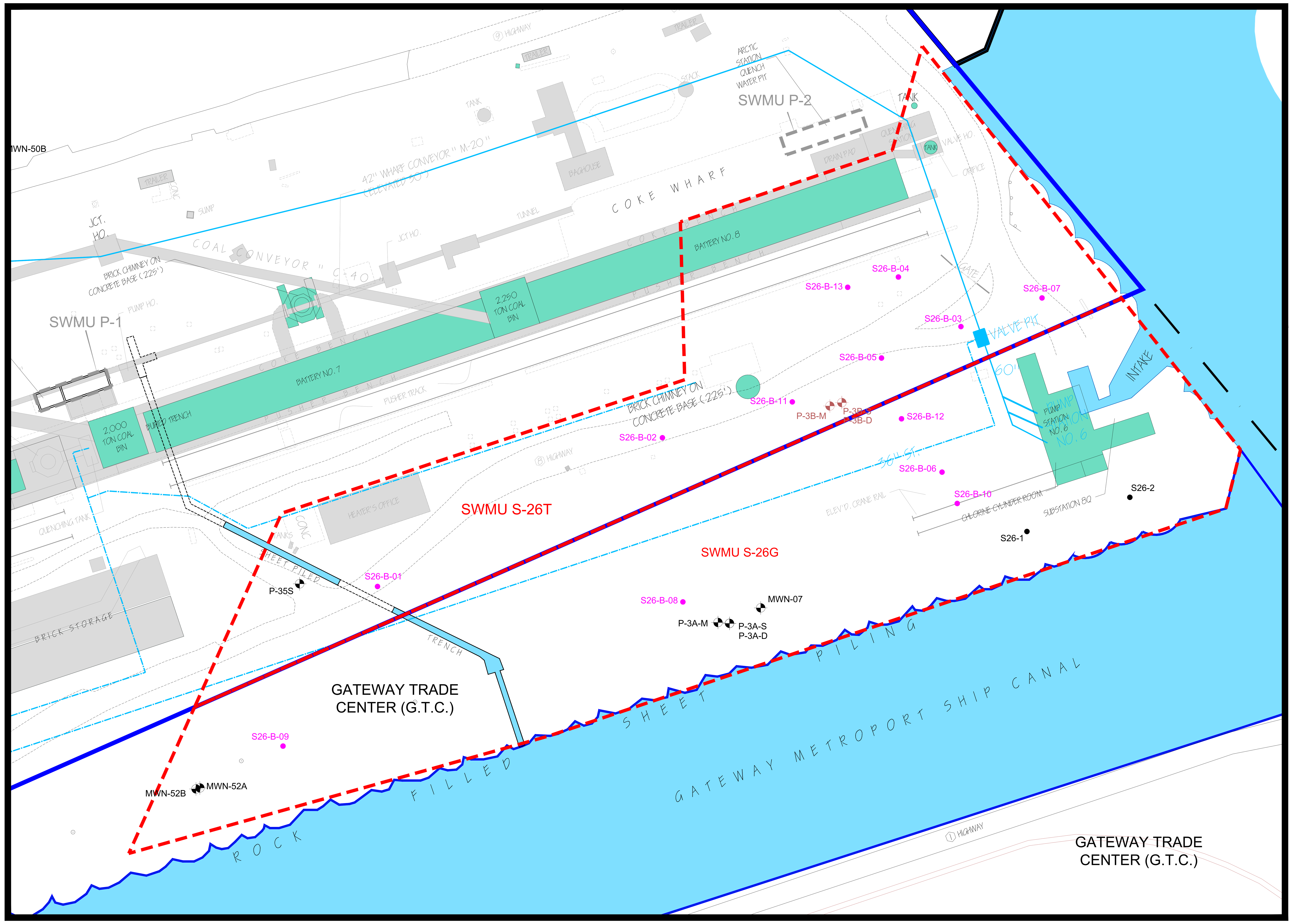
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 8

SITE PLAN:



SWMU S-26

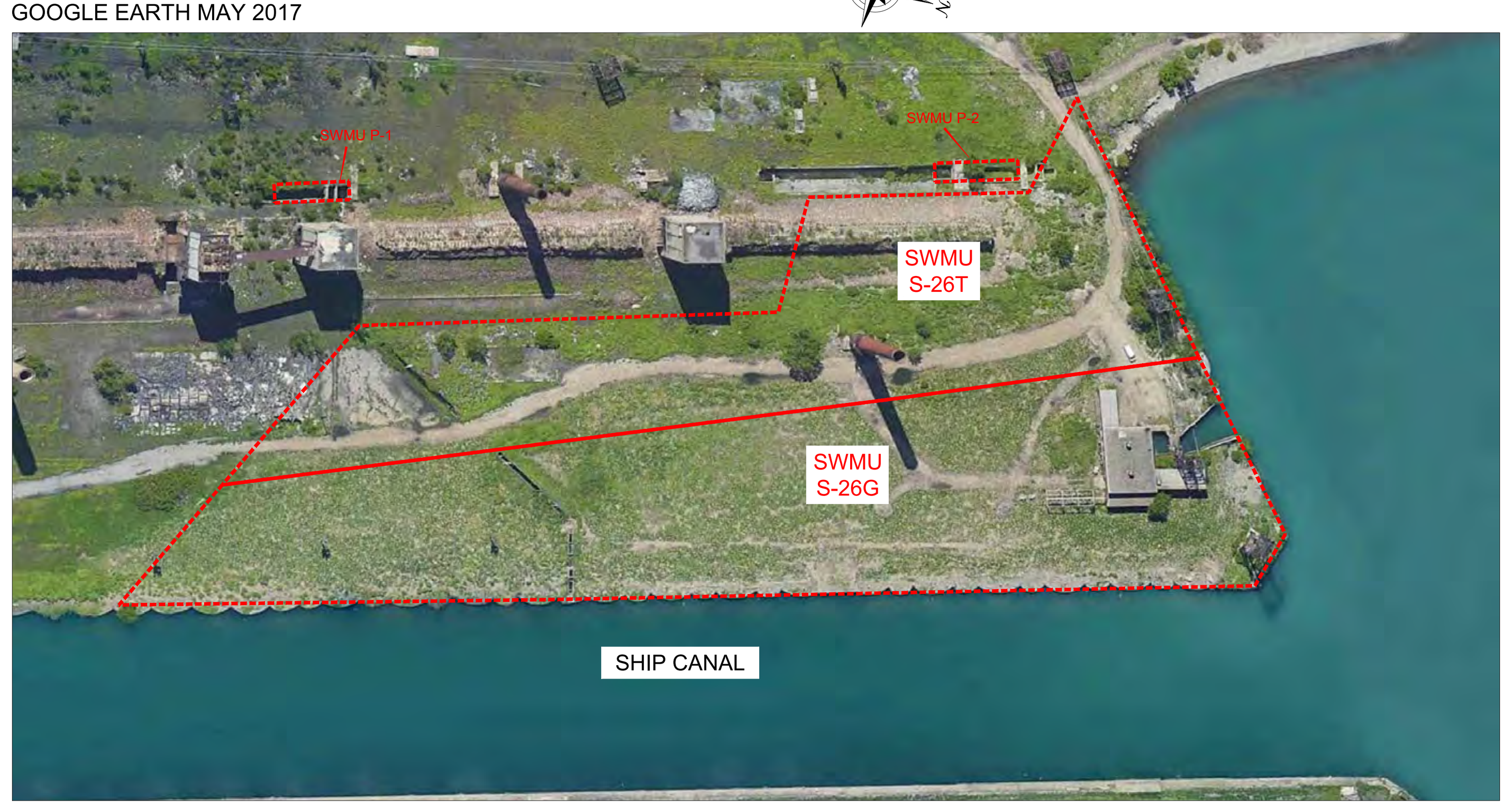


LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE
- EXISTING BUILDING / STRUCTURE
- CMS AREA BOUNDARY
- SWMU BOUNDARY
- COKE PLANT & BY-PRODUCTS SUB-AREA
- APPROXIMATE ALIGNMENT OF PLANT WATER MAIN LINES
- MWN-07 — EXISTING MONITORING WELL (A=FILL, B=SAND)
- P-3A-M — EXISTING PIEZOMETER (S=FILL, M=SAND, D=OTHER)
- P-3B-M — ABANDONED/DESTROYED PIEZOMETER (S=FILL, M=SAND, D=OTHER)
- S26-1 — RFI BORING (2)
- S26-B-4 — CMS BORING (10)

REPRESENTATIVE PHOTOGRAPHS:

SWMU S-26 AERIAL
GOOGLE EARTH MAY 2017



SWMU S-26 Drilling (looking SW)

SWMU S-26 1940s Oblique Aerial (looking SE)

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0071-017-111

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: RFL
DATE: MARCH 2019
CHECKED BY: PHW
APPROVED BY: PHW

COKE PLANT & BY-PRODUCTS FACILITY SUB-AREA
SWMU S-26 BORING & MONITORING WELL LOCATIONS
CMS REPORT
CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 9