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Subject:

Construction Completion Report for Source Area Excavation and NAPL
Recovery Well Installation
Orange and Rockland Utilities, Inc.
Port Jervis Former Manufactured Gas Plant Site
City of Port Jervis, Orange County, New York
Site No. 336049

ENVIRONMENT

Date:

October 31, 2019

Contact:

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Our ref:

30005361 - B0043021.0019

Dear Mr. Lanners:

On behalf of Orange and Rockland Utilities, Inc. (O&R), enclosed please find the *Construction Completion Report for Source Area Excavation and NAPL Recovery Well Installation* (CCR), which presents the results of the construction activities performed between July 2012 and August 2014 at the former manufactured gas plant (MGP) site generally located at 16 Pike Street in the City of Port Jervis, Orange County, New York (site). As described in the CCR, the construction activities generally involved the: 1) demolition of certain existing buildings at the site and at two adjacent off-site properties; 2) remediation of "source areas" located up to 20 feet below ground surface (bgs) at the site; and 3) installation of nine non-aqueous phase liquid (NAPL) recovery wells at off-site properties.

A draft of this CCR was submitted to NYSDEC on August 31, 2015. On November 6, 2015, NYSDEC provided comments on the draft CCR, which have been addressed in the enclosed document. This submission of the revised CCR was delayed while O&R and the Department discussed whether the groundwater treatment portion of the *Record of Decision* (ROD; NYSDEC, 2007) would be required and implemented.

As part of the site remedy, monthly NAPL monitoring and recovery events are currently being conducted on-site. The NAPL monitoring is being conducted in accordance with the NYSDEC-approved *NAPL Recovery Work Plan* (Arcadis 2014).

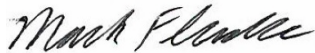
Daniel Lanners
NYSDEC
October 31, 2019

As required by the ROD, O&R will construct a groundwater treatment system downgradient of the site on the O&R owned 1-9 Pike Street (Meder) property. The groundwater will be treated by enhanced aerobic biodegradation of the contaminants. The air sparge and soil vapor extraction groundwater treatment system will be installed in accordance with the NYSDEC-approved *Remedial Design* (Arcadis 2017). Construction of the groundwater treatment system is anticipated to begin in late 2019 or early 2020.

If you would like to further discuss this CCR, the current site status, and future planned site activities, O&R and Arcadis would be glad to organize a meeting or conference call.

Please contact Ms. Maribeth McCormick of O&R at (914) 557-1361 with any questions or comments.

Sincerely,
Arcadis of New York, Inc.



Mark Flusche, P.G., P.Hg.
Principal Hydrogeologist

Copies:
Amen Omorogbe (NYSDEC)
Maribeth McCormick (O&R)
Michael Benoit (Arcadis)
Tyler Howe (Arcadis)

Enclosures:
Construction Completion Report for Source Area Excavation and NAPL Recovery Well Installation



CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

Port Jervis Former Manufactured Gas Plant Site
City of Port Jervis, Orange County, New York
Site No. 3-36-049

September 2019

A large orange geometric shape, consisting of a triangle and a rectangle, is positioned in the bottom right corner of the page. A thin white line runs diagonally across the orange shape. A thin white horizontal line runs across the page, intersecting the orange shape.

I, Michael J. Benoit, certify that I am currently a New York State-registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program, and I certify that the Remedial Design was implemented, and that all construction activities were completed, in substantial conformance with the DER-approved Remedial Design.




Michael J. Benoit, PE

September 11, 2019
Date

CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

Port Jervis Former Manufactured Gas Plant Site
City of Port Jervis, Orange County, New York
Site No. 3-36-049

Prepared for:

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September 2019

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CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND
NAPL RECOVERY WELL INSTALLATION

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- Appendix R Recovery Well Construction Logs

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ACRONYMS AND ABBREVIATIONS

Accutest	Accutest Labs of New England, Inc.
ACM	asbestos-containing material
Arcadis	Arcadis of New York, Inc.
ATC	Advance Testing Company, Inc.
ATL	Atlantic Testing Laboratories, Limited
Bayshore	Bayshore Soil Management, LLC
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAMR	Community Air Monitoring Report
CCR	Construction Completion Report
CLSM	controlled low-strength material
COC	constituent of concern
C.T. Male	C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, PC
cy	in-situ cubic yards
DAC	D.A. Collins Environmental Services, LLC
DNAPL	dense non-aqueous phase liquid
ENSR	ENSR Corporation
EPS	excavation protection system
ESMI	ESMI of New York, LLC
FS	feasibility study
GEI	GEI Consultants, Inc.
HASP	Health and Safety Plan
ISS	in-situ solidification
LNAPL	light non-aqueous phase liquid
LTTD	low-temperature thermal desorption
LVI	LVI Environmental Services, Inc.
MGP	manufactured gas plant
NAPL	non-aqueous phase liquid
NAVD88	North American Vertical Datum of 1988
NYCRR	New York Codes, Rules, and Regulations

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NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOL	New York State Department of Labor
NYSDOT	New York State Department of Transportation
Omega	Omega Environmental Services, Inc.
O&R	Orange and Rockland Utilities, Inc.
PAH	polycyclic aromatic hydrocarbon
PCE	tetrachloroethene
PDI	pre-design investigation
PM10	particulate matter less than 10 micrometers in diameter
ppm	parts per million
PRAP	Proposed Remedial Action Plan
PSA	preliminary site assessment
psi	pounds per square inch
RACM	regulated asbestos-containing material
RETEC	The RETEC Group, Inc.
RI	remedial investigation
ROD	Record of Decision
SCG	standard, criteria, and guidance
SI	supplemental investigation
SMP	site management plan
SPDES	State Pollutant Discharge Elimination System
SVI	soil vapor intrusion
Taylor Recycling	Taylor Recycling Facility, LLC
TFS	temporary fabric structure
Thew	Thew Associates PE-LS, PLLC
TWA	time-weighted average
UCS	unconfined compressive strength
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

1 INTRODUCTION

1.1 General

This Construction Completion Report (CCR) has been prepared by Arcadis of New York, Inc. (Arcadis), on behalf of Orange and Rockland Utilities, Inc. (O&R), to summarize and document the results of the construction activities performed at the former manufactured gas plant (MGP) site generally located at 16 Pike Street in the City of Port Jervis, Orange County, New York (the “Site”). As described in this CCR, the construction activities were performed between July 2012 and August 2014, and generally involved the: 1) demolition of certain existing buildings at the Site and at two adjacent off-site properties; 2) remediation of “source areas” located up to 20 feet below ground surface (bgs) at the Site; and 3) installation of non-aqueous phase liquid (NAPL) recovery wells at three off-site properties. The *Record of Decision* (ROD; New York State Department of Environmental Conservation [NYSDEC] 2007b) defines source areas as “...those identified locations on the site where there are former MGP structures containing waste and/or where significant volumes of soil have been found visually to be saturated with NAPL. Soils exhibiting odors, staining, and/or sheens are not included in the definition of ‘source areas’”. The remediation and well installation activities were performed pursuant to Order on Consent Index No. D3-0001-99-01 (NYSDEC 1999) and in substantial conformance with the ROD, *Final (100%) Remedial Design Report for Source Area Excavation* (Remedial Design; Arcadis 2011c), *NAPL Recovery Well Construction Study Work Plan* (Arcadis 2013b), and *NAPL Recovery Work Plan* (Arcadis 2014a).

This CCR has been prepared in accordance with Section 5.8 of NYSDEC’s *Technical Guidance for Site Investigation and Remediation* (DER-10; NYSDEC 2010) and other applicable NYSDEC guidelines.

1.2 Report Organization

The remainder of this CCR is organized into eight sections as follows:

- Section 2 (Site Background), presents general information regarding the pre-remediation conditions at the Site and in the off-site area, including the investigations and evaluations conducted, the remediation goals, and selected remedy for the Site and off-site area;
- Section 3 (Overview of Construction Activities), provides an overview of building demolition and remediation activities and identifies the contractors and consultants;
- Section 4 (Pre-Construction, Mobilization, and Site Preparation Activities), summarizes the activities and procedures that were implemented prior to and in preparation for the building demolition and remediation activities;
- Section 5 (Building Demolition Activities), summarizes the building demolition and related activities performed at the Site and at the off-site 12/14 Pike Street and 28 Pike Street properties;
- Section 6 (Remediation Activities), summarizes the remediation and related activities performed at the Site and at the off-site 28 Pike Street property;
- Section 7 (Off-Site NAPL Recovery Activities), summarizes the well installation, NAPL recovery, and related activities performed in the off-site area during and following construction;

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- Section 8 (Post-Construction Activities), summarizes the activities to be performed following the completion of construction, including the execution and recording of an environmental easement for the Site; and
- Section 9 (References), presents a list of documents referenced in this CCR.

Several appendices have been prepared and are included herein to supplement the contents of this CCR and other Site-related documents previously submitted to NYSDEC.

2 SITE BACKGROUND

2.1 General

This section provides general information regarding the pre-remediation conditions at the Site and in the off-site area, including the investigations and evaluations conducted by O&R and its consultants in these areas.

2.2 Site Location and Description

The Site is located at 16 Pike Street in the City of Port Jervis, Orange County, New York (Figure 1), and is identified as Section 18, Block 16, and Lot 2 (tax parcel 18-16-2) on the Orange County tax map. The 1.2-acre property is owned by O&R, and is generally bounded by Brown Street to the northwest, King Street to the northeast, Water Street to the southwest, and Pike Street and tax parcels 18-16-1 (28 Pike Street), 18-16-3 (12/14 Pike Street), and 18-16-4 (6 Pike Street) to the southeast (Figure 2). The Site is zoned for commercial and industrial use and is surrounded by a mix of residential and commercial properties. The Delaware River is located approximately 160 feet to the southwest of the Site (beyond Water Street) and is classified by NYSDEC as a Class A water body along this stretch.

The Site is surrounded by an eight-foot high chain-link fence topped with barbed wire and contains several buildings/features, the largest of which is a single-story brick office building. The office building formerly contained a customer service center, several offices, an equipment storage room, two loading docks, and a garage bay. A second smaller single-story brick building is located to the southwest of the office building and contains telecommunications equipment. A microwave tower is located on the southwest side of the telecommunications building. An active gas regulator station is located on the southwest side of the property (adjacent to Water Street) and is surrounded by a six-foot high chain-link fence. The majority of the Site is paved, and surface topography is generally flat with a gentle slope from south to north.

The off-site area comprises the 6 Pike Street, 12/14 Pike Street, and 28 Pike Street properties, which are all located on the same block as the Site, as well as tax parcels 18-14-8.2 (2/4 First Street) and 18-14-9.11 (1/9 Pike Street), which are located to the southeast of the Site on the south side of Pike Street. With the exception of the 6 Pike Street property, all of the off-site properties are owned by O&R.

The 6 Pike Street property is located immediately south of the Site on the corner of Pike and Water Streets and is owned by the State of New York. The 12/14 Pike Street property is located immediately southeast of the Site on Pike Street and, prior to the construction activities described herein, contained a vacant two-story apartment building with a partial basement. The 28 Pike Street property is located immediately east of the Site on the corner of Pike and King Streets and, prior to the construction activities described herein, contained a vacant three-story building with a partial basement. The first floor of the building was formerly used as a restaurant and the top two floors contained apartments.

The 1/9 Pike Street and 2/4 First Street properties (former Meder properties) are generally bounded by Pike Street to the northwest, privately-owned residential properties to the northeast, the Delaware River to the southwest, and First Street to the southeast. The 1/9 Pike Street property contains a two-story commercial building and customer parking lot, a vacant three-story apartment/boarding house, a single-story meeting hall, and a small storage shed (located in the rear of the parking lot near First Street). The 2/4 First Street property contains a vacant two-story residential building.

2.3 Site History

2.3.1 Operational History

In the mid-1800s, the Port Jervis Gas and Light Company operated the MGP at the Site. The MGP employed a variety of production processes over the subsequent decades of operation and used coal and naphtha as feed stock. Naphtha, which is a flammable liquid derived by distilling crude oil, was delivered by an underground pipeline to the western side of the MGP from a railroad yard. Various forms of infrastructure were built or relocated within and around the Site throughout the operation of the MGP, including naphtha tanks, lime purifier beds, sawdust purifier beds, tar wells, and at least four separate gas holders. A tail race from the Delaware and Hudson Canal passed through the Site and discharged to the Delaware River. The tail race was abandoned and backfilled by 1905 and currently contains a 36-inch-diameter storm sewer line that discharges to the Delaware River.

The MGP ceased regular operations in 1938, at which time natural gas was introduced to the area. By 1959 most of the above-grade portions of the MGP-related structures had been demolished to make way for the construction of the current Operations Center.

Figure 3 depicts the approximate locations of the historical structures/features associated with the former MGP and identifies the approximate year in which such structures/features were constructed.

2.3.2 Regulatory History

O&R entered into Order on Consent Index No. D3-0002-9412 (NYSDEC 1996) with the NYSDEC on January 2, 1996 to investigate several former MGP sites in its service area. Order on Consent Index No. D3-0002-9412 was superseded by Order on Consent Index No. D3-0001-99-01, which clarified O&R's obligation to investigate and, as necessary, remediate the Site.

2.3.3 Remedial History

In June 1996, Ira D. Conklin & Sons, Inc. was retained by O&R to remove a 4,000-gallon diesel fuel underground storage tank (UST) and 229.55 tons of petroleum-impacted soil from the Site (NYSDEC Spill No. 95-04682). The tank was removed following a tank pressure test failure. Until the time of the removal, the UST was active and used by O&R to fuel company vehicles from a fuel island at the eastern side of the Site. The tank is designated as "Diesel UST N" on Figure 3. The results of the removal and clean-up work were presented in the *Site Assessment/Tank Closure Summary Report for Property at Orange and Rockland Utilities, Pike Street, New York* (Ira D. Conklin & Sons, Inc. 1996). According to that report, the petroleum-impacted soil was believed to be the result of piping failure and spills related to port overfills.

In April 1998, Metro-Tank, Inc. was retained by O&R to remove a 1,000-gallon gasoline UST and 110 in-situ cubic yards (cy) of petroleum-impacted soil from the Site. The tank is designated as "Gasoline UST M" on Figure 3 and was originally used to store and dispense gasoline for O&R company vehicles. The results of the removal and clean-up work were presented in the *Underground Storage Tank Site Assessment Report for the Port Jervis Satellite Building* (Metro-Tank, Inc. 1998).

2.4 Previous Investigations and Evaluations

2.4.1 Preliminary Site Assessment

A preliminary site assessment (PSA) was performed in 1998 to determine if contamination was present at the Site as a result of previous (historical) property use and operations. The investigation included surface soil sampling, subsurface soil sampling via test pits and soil borings, sediment sampling, monitoring well installation, and groundwater sampling. The results of the PSA, which were presented in the *Preliminary Site Assessment Report* (GEI Consultants, Inc. [GEI] 1998), indicated that 1) MGP-related contamination was present and 2) a remedial investigation (RI) was warranted to fully characterize environmental conditions at the Site.

2.4.2 Remedial Investigation

An RI was performed between September 2000 and October 2005 to determine the nature and extent of MGP-related contamination at the Site, in the off-site area, and in the stretch of Delaware River adjacent to and hydraulically down gradient of the Site and off-site area. Through extensive sampling and laboratory testing, the RI: 1) identified the length, depth, and width of contamination; 2) defined the pathways of migration; and 3) quantified the degree of contamination in all potentially affected environmental media, including sediment, groundwater, soil, and soil vapor. The investigation at the Site and in the off-site area included the collection of several surface soil samples to assess surface soil quality, excavation of test pits and drilling of soil borings to assess subsurface soil quality, installation of monitoring wells to assess groundwater flow and quality, and an assessment of the possibility for indoor air contamination at buildings in and around the Site due to soil vapor intrusion (SVI). The investigation of the Delaware River area included the drilling of soil borings along the shoreline to assess subsurface soil quality, the collection of groundwater samples from temporary wells installed at the boring locations to assess groundwater flow and quality, the probing of sediment in outfall areas and the river, and the collection and analysis of sediment samples to assess sediment quality. The results of the RI were presented in the *Remedial Investigation Report Phase II* (The RETEC Group [RETEC] 2005).

2.4.3 Feasibility Study

A feasibility study (FS) was conducted to identify and evaluate potential remedial alternatives for the Site. Through the engineering evaluation presented in the *Feasibility Study* (FS Report; RETEC 2006), and based on specific criteria, the most appropriate remedy was selected for the Site and off-site area.

2.4.4 Initial Supplemental Investigation

An initial supplemental investigation (SI) was performed between June and July 2006 at the 28 Pike Street property to assess whether any MGP-related impacts were present at or beneath the building on that property. The results of the initial SI were presented in the *Supplemental Investigation Report* (RETEC 2007a).

CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

2.4.5 Proposed Remedial Action Plan

NYSDEC's *Proposed Remedial Action Plan* (PRAP; NYSDEC 2007a) identified the preferred remedial approach to address MGP-related contamination at the Site and in the off-site area. The PRAP was made available for public comment for a period of 30 days and a public meeting was held to describe the elements of the remedy. In response to comments received, the comment period was extended for an additional 30 days.

2.4.6 Supplemental SVI Investigation (Site)

A supplemental SVI investigation¹ was performed at the Site in March 2007 to further evaluate the potential intrusion of tetrachloroethene (PCE) at the O&R office building. PCE, a dry cleaning agent that is not related to the historical operation of the MGP, was previously identified in soil vapor at the 28 Pike Street property during the initial SI. The results of the supplemental SVI investigation were presented in the *Soil Vapor Intrusion Evaluation* (RETEC 2007b).

2.4.7 Supplemental SVI Investigation (28 Pike Street Property)

At the request of the New York State Department of Health (NYSDOH), a supplemental SVI investigation² was performed at the 28 Pike Street property in March 2007 to further evaluate the potential vapor intrusion pathway at that property. The results of the investigation were presented in the *Soil Vapor Intrusion Evaluation Report* (RETEC 2007c).

2.4.8 Record of Decision

Based on the results of the RI, the evaluation of remedial alternatives presented in the FS Report, and public input received on the PRAP, the NYSDEC selected a remedy that would achieve the remediation goals for the Site. The selected remedy was presented in the December 2007 ROD and is summarized in Section 2.8 below.

2.4.9 Additional Supplemental Investigation

An additional SI was performed between February and March 2008 at the Site and 28 Pike Street property to address the concerns of the then-current 28 Pike Street property owner. Specifically, the owner requested that additional sampling be performed to further assess the presence or absence of contaminants at his property and in two adjacent areas at the Site. The results of the additional SI were presented in the *Supplemental Investigation Report* (ENSR Corporation [ENSR] 2008a).

2.4.10 Interim Remedial Measure Work Plan

The *Interim Remedial Measure Work Plan: Surface Soil Removal and Sub-slab Depressurization System* (IRM Work Plan; ENSR 2008b) provided details regarding the implementation of the portion of the remedy targeting the 28 Pike Street property. This includes the removal of surface soils in the western portion of the 28 Pike Street property and the installation of a concrete floor and SVI mitigation system

¹ SVI investigations were previously performed at the Site as part of the RI.

² SVI investigations were previously performed at the 28 Pike Street property as part of the RI and initial SI.

CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

within the basement of the building at that property (ENSR 2008b). As described in Section 2.8 below, O&R purchased the 28 Pike Street property subsequent to the issuance of the ROD and submittal of the IRM Work Plan. In lieu of installing the SVI mitigation system, which was determined to be infeasible based on the construction and condition of the building, O&R elected to demolish the building.

2.4.11 Remedial Design Work Plan

The *Remedial Design Work Plan* (RD Work Plan; Arcadis 2010a) was prepared to describe the activities necessary to complete the remedial design for the selected remedy, including the anticipated scope of and rationale for several pre-design investigation (PDI) activities. The RD Work Plan was approved by NYSDEC on February 3, 2010 and the PDI activities were initiated shortly thereafter.

2.4.12 Initial PDI Activities

The initial PDI activities were performed between February and May 2010 and included surveys, soil investigations, and various groundwater-/NAPL-related assessments. The results of these activities were presented in the *Semi-Annual PDI Status Report for NAPL and Groundwater/Hydrogeologic Assessments* (2010 Status Report; Arcadis 2010b), *Semi-Annual PDI Status Report Addendum for NAPL and Groundwater/Hydrogeologic Assessments* (Status Report Addendum; Arcadis 2010c), and *PDI Report for Survey and Soil Investigation Activities* (Initial PDI Report; Arcadis 2010d). The 2010 Status Report and Status Report Addendum were collectively approved by NYSDEC on July 7, 2010 and the Initial PDI Report was approved by NYSDEC on October 13, 2010.

2.4.13 Delaware River Sediment Monitoring

Sediment monitoring activities were conducted in May 2010 in accordance with the RD Work Plan. The monitoring activities included the collection of surface sediment samples at eight locations in the Delaware River, and probing and visual characterization of sediments at the outfall of the 36-inch diameter storm sewer. The results of the monitoring event were presented in the *Status Report for Sediment Monitoring Activities* (Arcadis 2010e), which was approved by NYSDEC on October 14, 2010. In addition, a statistical and compositional data analysis of the monitoring results was conducted and presented in the *Second Status Report for Sediment Monitoring Activities* (Arcadis 2010f). NYSDEC commented on the statistical and compositional data analysis in a letter to O&R dated April 19, 2011.

2.4.14 Supplemental PDI Activities

Supplemental PDI activities were conducted to 1) further assess the condition, dimensions, and contents of the foundation of former Gas Holder A and 2) evaluate the applicability of in-situ solidification (ISS) at depths below the water table. These activities were performed in accordance with a November 19, 2010 letter to NYSDEC (Arcadis 2010g), which was approved by NYSDEC on that same date. The field activities were performed at the Site on November 23, 2010 and included the drilling of soil borings, collection of soil samples for an ISS bench-scale treatability study, and installation of a piezometer (PZ1). The ISS bench-scale treatability study was subsequently performed between December 2010 and March 2011. The results of the supplemental PDI activities were presented in the *ISS Bench-Scale Treatability Study Report* (ISS Treatability Study Report; Arcadis 2011a), which was approved by NYSDEC on July 13, 2011.

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2.4.15 Groundwater Level Monitoring

Between January 2011 and June 2012, Arcadis conducted a groundwater level monitoring program to assess the fluctuation in groundwater elevations based on weather conditions and the surface water elevation of the Delaware River. The results of the groundwater level monitoring program were presented in the June 2011 *PDI Status Report for NAPL and Groundwater/Hydrogeologic Assessments* (June 2011 PDI Status Report; Arcadis 2011b), January 2012 *PDI Status Report for NAPL and Groundwater/Hydrogeologic Assessments* (Arcadis 2012a), and June 2012 *PDI Status Report for NAPL and Groundwater/Hydrogeologic Assessments* (Arcadis 2012c).

2.4.16 Off-Site PDI Activities

The off-site PDI activities were performed between April and May 2011, and generally included the drilling of soil borings and installation of monitoring wells at the 1/9 Pike Street, 6 Pike Street, 12/14 Pike Street, and 2/4 First Street properties. The results of the off-site PDI activities were presented in the June 2011 PDI Status Report, which was approved by NYSDEC on February 22, 2012.

2.5 Site Geology and Hydrogeology

Previous investigations have identified four unconsolidated units located beneath the Site and off-site area (in descending order): fill, fine-grained alluvium, coarse-grained alluvium, and glacial outwash. These units are consistent with the glaciofluvial deposits found in this region. Gray shale bedrock underlies the unconsolidated units at depths ranging from approximately 148 to 180 feet bgs.

Groundwater at the Site is located between approximately 16 and 20 feet bgs and generally flows southwestward towards the Delaware River. City residents and businesses are served by a municipal water supply derived from a system of reservoirs. No private wells were identified near the Site. Based on the results of the groundwater level monitoring program conducted between January 2011 and June 2012, the groundwater elevations at the Site are slightly affected by the rise and fall of the Delaware River. In addition, the groundwater levels are more significantly affected by precipitation, as evidenced by a rise in groundwater elevation following snow melt and rain events during the monitoring period.

2.6 Nature and Extent of Contamination

The remedy selected by the NYSDEC, as summarized in Section 2.8 below, focuses on contamination resulting from the release of manufactured gas byproducts and an apparent feedstock of the former MGP. The byproducts are dense oily liquids known as coal tar. Coal tar is typically denser than, and does not readily mix with, water; hence it is referred to as a dense non-aqueous phase liquid (DNAPL). Some coal tars have zero buoyancy and may be considered a light non-aqueous phase liquid (LNAPL). In addition, naphtha was used at the Site in the gas manufacturing process. Naphtha is a petroleum product that does not readily mix with water and is lighter than water; hence it is also referred to as a LNAPL. Other byproducts of the MGP include cyanide and various metals. These byproducts were either not determined to be an issue at the Site (cyanide) or were generally found to be co-located with areas impacted by NAPL (NYSDEC 2007b).

For the purposes of the selected remedy, the ROD defines source areas as "...those identified locations on the site where there are former MGP structures containing waste and/or where significant volumes of

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soil have been found visually to be saturated with NAPL. Soils exhibiting odors, staining, and/or sheens are not included in the definition of ‘source areas’” (NYSDEC 2007b). The ROD concluded that source areas at the Site appear to be directly associated with several of the former MGP structures, notably Gas Holder A, Gas Holder C, Gas Holder D, and Tar Separator O (Figure 3). While the ROD’s definition of “sources areas” does not distinguish between DNAPL and LNAPL, the majority of source material at the Site appears to be DNAPL based on its occurrence below the water table. LNAPL was positively identified in one well at the Site (MW1S) and in two wells in the off-site area (MW22 and MW26). A trace amount of LNAPL was also inferred in monitoring wells MW10D and MW15S, but no measurable thickness was identified in either well. A yellowish oil-like material was observed at or near the top of the water table in certain soil borings drilled at the Site during the PDI.

The ROD identifies two main categories of constituents of concern (COCs): volatile organic compounds (VOCs), specifically benzene, toluene, ethylbenzene, and xylenes (collectively, “BTEX”), and a number of polycyclic aromatic hydrocarbons (PAHs). All of these compounds are components of coal tar. Petroleum feedstocks used at the MGP may also have contained some of these compounds.

During previous investigations at the site, NAPL has been observed¹) in scattered, discontinuous globules and 2) in seams within the unconsolidated deposits. These conditions generally coincide with the elevated concentrations of COCs observed in soil and groundwater. The remedy presented in the ROD was selected in consideration of the nature and extent of MGP-related contamination determined during the PSA and RI. It should be noted, however, that several investigations, including the initial SI, supplemental SVI investigations, additional SI, and PDI, were performed subsequent to the PSA/RI to further investigate the nature and extent of contamination in and around the Site. The results of these additional investigations did not substantively change the understood nature and extent of contamination, nor necessitate any changes to the selected remedy. Additional information regarding the nature and extent of contamination in environmental media at the Site and in the off-site area is provided in the ROD.

2.7 Remediation Goals

The remediation goals for the Site, as presented in Section 6 of the ROD, were established through the remedy selection process set forth in Title 6, Part 375 of the New York Codes, Rules, and Regulations (6 NYCRR 375), and include the following:

- Eliminate, or reduce to the extent practicable, human, flora, and fauna contact with surface and subsurface soils exceeding standards, criteria, and guidance (SCGs);
- Eliminate, or reduce to the extent practicable, the migration of LNAPL and DNAPL in groundwater and subsurface soil;
- Eliminate, or reduce to the extent practicable, the off-site migration of groundwater that does not attain New York State Class GA ambient water quality standards and guidance values³; and
- Prevent, to the extent practicable, human, flora, and fauna contact with groundwater containing Site-related constituents that do not attain Part 5 of the New York State Sanitary Code (10 NYCRR 5)

³ New York State Class GA ambient water quality standards and guidance values are set forth in NYSDEC’s Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, titled *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 1998).

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drinking water standards and/or New York State Class GA ambient water quality standards and guidance values.

2.8 Selected Remedy

To achieve the remediation goals, NYSDEC (in consultation with NYSDOH) selected an appropriate remedy for the Site. The remedy was selected: 1) based on the results of the RI, FS, and initial SI; and 2) in consideration of public comments received on the PRAP. The primary elements of the selected remedy are summarized as follows:

1. Implementation of a remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. Demolition, excavation, and off-site disposal of former MGP structures and their contents.
3. Excavation of “source area” soils to a maximum depth of 20 feet bgs and off-site disposal of excavated soils.
4. Excavation of surface soils to a depth of two feet bgs within a portion of the off-site 28 Pike Street property, off-site disposal of excavated soils, and restoration of the excavation with clean soil, as defined by NYSDEC.
5. Installation of a concrete slab, or other cover system, and sub-slab depressurization system over exposed soils in the basement of the 28 Pike Street building.
6. Installation of NAPL collection wells to remove NAPL from the subsurface.
7. Installation of groundwater treatment wells downgradient of the Site to intercept and treat (via enhanced aerobic biodegradation) the dissolved phase groundwater plume heading toward the Delaware River.
8. Installation of a cover system (e.g., pavement) at the Site to prevent exposure to contaminated surface and subsurface soils.
9. Imposition of an institutional control in the form of an environmental easement that will: a) limit the use and development of the property to commercial or industrial use; b) require compliance with the approved site management plan (SMP); c) restrict the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH; and d) require the property owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls.
10. Development of a SMP, which will include the following institutional and engineering controls:
 - Management of the final cover system to restrict excavation below the soil cover’s demarcation layer, pavement, or buildings;
 - Continued evaluation of the potential for vapor intrusion for any buildings developed on the Site, including provision for mitigation of any impacts identified;
 - Monitoring of groundwater and Delaware River sediments;
 - Identification of any use restrictions on the Site; and
 - Provisions for the continued proper operation and maintenance of the components of the remedy.

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11. Periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to NYSDEC, until NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal will: a) include a certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with NYSDEC-approved modifications; b) allow NYSDEC access to the Site; and c) state that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the SMP unless otherwise approved by NYSDEC.
12. Continued operation of the components of the remedy until the remedial objectives have been achieved, or until NYSDEC determines that continued operation is technically impracticable or not feasible.

Subsequent to the issuance of the ROD, O&R purchased the 1/9 Pike Street, 28 Pike Street, and 2/4 First Street properties. In lieu of installing a SVI mitigation system in the basement of the building at the 28 Pike Street property, which was determined to be infeasible based on the construction and condition of the building, O&R elected to demolish the building.

In addition, in December 2012, NYSDEC approved a minor modification to the remedy for the Gas Holder A excavation area that generally involved the: 1) excavation of existing soil and debris to a depth of approximately 15 feet bgs; and 2) ISS of existing soils located between approximately 15 and 20 feet bgs. Additional information regarding the minor modification to the remedy for the Gas Holder A excavation area is provided in Section 6.2.1 of this CCR.

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3 OVERVIEW OF CONSTRUCTION ACTIVITIES

The construction activities were performed between July 2012 and August 2014, and generally involved the following:

- Demolition of the 12/14 Pike Street apartment building, O&R office building garage bay (16 Pike Street), and 28 Pike Street restaurant/apartment building;
- Demolition and excavation/removal of certain former MGP structures at the Site;
- Excavation or ISS of “source area” soils located up to 20 feet bgs at the Site;
- Excavation of surface soils located within the western portion of the 28 Pike Street property; and
- Installation of NAPL recovery wells at the off-site 1/9 Pike Street, 6 Pike Street, and 12/14 Pike Street properties.

The building demolition and remediation activities were performed on behalf of O&R by D.A. Collins Environmental Services, LLC (DAC) of Wilton, New York. Table 1 below identifies the key DAC subcontractors and suppliers that also had significant roles on the project.

Table 1 List of Key DAC Subcontractors and Suppliers

Subcontractor/Supplier	Role	Contact Information
Advance Testing Company, Inc.	Geotechnical Testing Laboratory	3348 Route 208 Campbell Hall, New York 10916
Allsite Structure Rentals, LLC	Design/Manufacturer of Temporary Fabric Structure	4540 Copper Sage Street Las Vegas, Nevada 89115
Aquifer Drilling & Testing, Inc.	Well Decommissioning	75 East 2nd Street Mineola, New York 11501
Armistead Mechanical, Inc.	Refrigerant Recovery	168 Hopper Avenue Waldwick, New Jersey 07463
Atlantic Testing Laboratories, Limited	Geotechnical Testing Laboratory	251 Upper North Road Highland, New York 12528
Bayshore Soil Management, LLC	Thermal Treatment/Disposal Facility for Excavated Soil and Debris	P.O. Box 290 75 Crows Mill Road Keasbey, New Jersey 08832
Chemical Waste Management, Inc.	Disposal Facility for Coal Tar Wrap Pipe	P.O. Box 55 Emelle, Alabama 35459
Clean Waters of New York, Inc.	Treatment/Disposal Facility for Construction Wastewater	3249 Richmond Terrace P.O. Box 030312 Staten Island, New York 10303
C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, PC	Pre-, Interim-, and Post-Construction Structural Inspections	50 Century Drive Latham, New York 12110
Dick's Concrete Company, Inc.	Off-Site Source of Soil Fill, Run-of-Bank Gravel, Crushed Stone, Controlled Low-Strength Material, and Topsoil	123 Ryan Street Port Jervis, New York 12771
ESMI of New York, LLC	Thermal Treatment/Disposal Facility for Excavated Soil and Debris	304 Towpath Road Fort Edward, New York 12828

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Subcontractor/Supplier	Role	Contact Information
Hayward Baker, Inc.	Pre-Drilling for Sheet Pile Installation	1130 Annapolis Road, Suite 202 Odenton, Maryland 21113
LVI Environmental Services, Inc.	Universal Waste Removal, Asbestos Abatement, and Building Demolition	120 Elmgrove Park Rochester, New York 14624
Midhurst Tree Care	Tree Removal	66 Snover Road Sussex, New Jersey 07461
Miller Environmental Group, Inc.	Transporter for Universal Wastes	538 Edwards Avenue Calverton, New York 11933
Minerva Enterprises, LLC	Disposal Facility for Regulated Building Demolition Debris	8955 Minerva Road Waynesburg, Ohio 44688
PipeLogix, Inc.	Pre-Construction Video Inspection of Storm Sewer	P.O. Box 14014 Palm Desert, California 92255
Precision Industrial Maintenance, Inc.	Post-Construction Video Inspection of Storm Sewer	1710 Erie Boulevard Schenectady, New York 12308
Ryan-Biggs Associates, PC	Design of Alternate Excavation Protection System for Gas Holder A Excavation Area	257 Ushers Road Clifton Park, New York 12065
Sullivan County Paving and Construction, Inc.	Paving	420 Bernas Road Cochecton, New York 12726
Taylor Recycling Facility, LLC	Recycling Facility for Non-Regulated Building Demolition Debris, Scrap Metal, and Asphalt	350 Neelytown Road Montgomery, New York 12549
Thew Associates PE-LS, PLLC	Construction Surveys	9478 River Road Marcy, New York 13403
TIGG Corporation	Design of and Vendor for Air Treatment System for Temporary Fabric Structure	1 Willow Avenue Oakdale, Pennsylvania 15071
Vibra-Tech Engineers, Inc.	Vibration Monitoring During Sheet Pile Installation	9117 Leesgate Road, Suite 100 Louisville, Kentucky 40222

Arcadis (Engineer-of-Record) provided daily on-site observation and documentation of the work performed by DAC and implemented the community air monitoring program on behalf of O&R. GEI (Construction Manager) served as O&R's on-site representative, and managed and administered the DAC contract on behalf of O&R. Omega Environmental Services, Inc. (Omega) served as the asbestos project air sampling technician and performed asbestos air sampling on behalf of O&R during the controlled demolition of the 12/14 Pike Street and 28 Pike Street buildings.

The sidewalk restoration activities, which were completed following DAC's demobilization from the Site, were performed on behalf of O&R by Verticon Ltd. between October and November 2013.

The off-site recovery well installation activities were performed on behalf of O&R by Arcadis and its subcontractors (Parratt-Wolff, Inc. and Cascade Drilling, L.P.) between March 5 and March 25, 2013 (RW-1 through RW-4) and between August 5 and August 15, 2014 (RW-5, RW-6, RW-7, RW-8S, and RW-8D).

Representative photographs taken during the project are provided in Appendix A of this CCR.

4 PRE-CONSTRUCTION, MOBILIZATION, AND SITE PREPARATION ACTIVITIES

4.1 General

This section summarizes the activities and procedures that were implemented prior to and in preparation for the building demolition and remediation activities.

4.2 Citizen Participation and Public Outreach Activities

A NYSDEC-issued fact sheet announcing the planned scope and start date of the construction activities was distributed to the project contact list on June 5, 2012. The fact sheet also invited the public to attend a public information meeting, which was held at the Port Jervis Recreation Center on June 19, 2012. The meeting was attended by representatives of NYSDEC, NYSDOH, and O&R (including Arcadis, DAC, and GEI).

O&R issued news releases on July 5, 2012, August 23, 2012, August 24, 2012, September 14, 2012, and April 15, 2013 to keep the public and surrounding community informed of the construction progress. News articles also appeared in the Times Herald-Record on July 11, 2012, August 24, 2012, and January 10, 2013.

4.3 Soil/Concrete Characterization and Piezometer Decommissioning

The soil/concrete characterization and piezometer decommissioning activities were conducted by Arcadis between June 5 and June 8, 2012 in accordance with the *Pre-Construction Soil/Concrete Characterization and Piezometer Decommissioning Work Plan* (Pre-Construction Work Plan; Arcadis 2012b). The soil characterization activities involved the drilling of four soil borings (SC-1 through SC-4) within the Gas Holder A excavation area, and the collection and analysis of soil samples to characterize those materials for: 1) off-site treatment/disposal at a low temperature thermal desorption (LTTD) facility; 2) off-site disposal at a non-hazardous landfill; and 3) potential re-use on-site as subsurface backfill. The concrete characterization activities involved the drilling of cores through the foundations of former Gas Holders C and D, and the collection and analysis of two composite concrete core samples (one composite sample per foundation) to characterize those materials for off-site disposal at a non-hazardous landfill. Soil and concrete characterization samples were submitted to Accutest Labs of New England, Inc. (Accutest) for chemical testing in accordance with Table 1 of the Pre-Construction Work Plan.

The soil and concrete waste characterization results were submitted electronically to NYSDEC on August 29, 2012 and are provided in Appendix B of this CCR. The soil characterization results demonstrated that the top 10 feet of existing soil in the areas of soil borings SC-1 and SC-3, and the top six feet of existing soil in the area of soil boring SC-4 (approximately 1,350 cy total) met the SCGs for subsurface soil and were therefore suitable for re-use on-site as subsurface backfill. On August 31, 2012, NYSDEC approved the on-site re-use of these soils as subsurface backfill, generally between the depths of eight and 14 feet bgs, within the limits of the Gas Holder A excavation area. A figure depicting the horizontal and vertical

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limits of existing soils subject to re-use within the Gas Holder A excavation area was submitted electronically to NYSDEC on September 13, 2012 and was approved on September 19, 2012. The soils located within the limits of the foundation of former Gas Holder A itself, as characterized by the samples collected from soil boring SC-2, were not subject to re-use on-site since they did not meet the SCGs for subsurface soil. The locations of the soil and concrete characterization samples and the limits of the re-use soils are shown on Figure B-1 in Appendix B of this CCR.

Piezometer PZ1 was decommissioned on June 7, 2012 in accordance with NYSDEC's *Groundwater Monitoring Well Decommissioning Policy* (CP-43; NYSDEC 2009). The decommissioning log is provided in Appendix C of this CCR.

4.4 Pre-Construction Meeting

A pre-construction meeting was held at the Site on June 19, 2012 to discuss the planned scope and sequence of construction activities. The meeting was attended by representatives of O&R, Arcadis, GEI, and DAC. Topics covered at the pre-construction meeting included project communications, health and safety, community air monitoring, community relations, site security, work hours, and project schedule.

4.5 Relocation of O&R Employees and Operations

O&R employees and operations were relocated from the Site to alternate facilities and service centers before the building demolition and remediation activities were initiated. The relocation activities were substantially complete by the end of June 2012.

4.6 Permits and Approvals

4.6.1 Asbestos Variances and Project Notifications

On July 2, 2012, LVI Environmental Services, Inc. (LVI) filed asbestos variance petitions with the New York State Department of Labor (NYSDOL) for the controlled demolition of the 12/14 Pike Street and 28 Pike Street buildings. The petitions sought relief from the provisions of 12 NYCRR 56-11.5(c)(2), which would have otherwise required that DAC/LVI close down adjacent portions of Pike Street and King Street (generally located within 25 feet of the buildings) during the demolition work. The required asbestos project notifications were filed by LVI on July 26, 2012, and the asbestos variances were granted by NYSDOL on August 1, 2012. Copies of the asbestos variances, asbestos project notifications, and LVI's asbestos handling license are provided in Appendix D.

4.6.2 Building Condemnation

By letters dated August 9, 2012, the City of Port Jervis declared the 12/14 Pike Street and 28 Pike Street buildings unsafe and required the immediate demolition of both buildings. As required by those letters, the buildings were secured and entry was barred until the demolition activities were complete.

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4.6.3 Wastewater Discharge Permit

O&R obtained a State Pollution Discharge Elimination System (SPDES) equivalency permit from NYSDEC on August 10, 2012 that allowed O&R to discharge treated construction wastewater generated during the project to the Delaware River. Before authorization would be given to discharge under the permit, NYSDEC requested that O&R provide additional details regarding the on-site temporary wastewater treatment system and proposed discharge location. Those additional details, which included a process flow diagram, specifications for treatment media and media storage vessels, and a figure depicting the proposed discharge location, were submitted electronically to NYSDEC on September 18, 2012.

The volume of construction wastewater generated during the project was significantly less than originally anticipated. As a result, there was no need to treat construction wastewater on-site and discharge under the SPDES equivalency permit. All construction wastewater generated during the project was ultimately transported off-site for treatment/disposal.

4.6.4 Demolition Permits

DAC obtained demolition permits from the City of Port Jervis on August 13, 2012 for the demolition of the 12/14 Pike Street apartment building, O&R office building garage bay (16 Pike Street), and 28 Pike Street restaurant/apartment building. The permits were posted in a prominent location at the Site until the demolition work was completed.

4.6.5 Waste Transporter Permits

All waste transporters hauling regulated waste materials from the Site had valid and current Waste Transporter Permits from NYSDEC pursuant to 6 NYCRR 364.

4.6.6 Building Permit

DAC obtained a building permit from the City of Port Jervis on November 2, 2012 for the installation of the temporary fabric structure (TFS), which was used to control odor, vapor, and dust emissions during the excavation/ISS activities within the Gas Holder A excavation area. The permit was posted in a prominent location at the Site until the TFS was removed and demobilized from the Site.

4.7 Pre-Mobilization Submittals

Before mobilizing to the Site, DAC prepared several required submittals, including an Operations Plan (submitted electronically to NYSDEC on August 14, 2012), a Health and Safety Plan (HASP), and a Contingency Plan. DAC also prepared an Excavation Protection and Support Work Plan, which provided general information regarding the installation, monitoring, and removal of the temporary excavation protection system (EPS) for the Gas Holder A excavation area. Appendix C of that work plan included an alternate EPS design prepared by Ryan-Biggs Associates, PC that was implemented in lieu of the EPS design included in the Remedial Design. In general, the alternate EPS design divided the excavation area into two excavation cells (Cells 1 and 2) and used slightly heavier steel sheet piles and a different internal

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bracing configuration. DAC's Excavation Protection and Support Work Plan was submitted electronically to NYSDEC on August 23, 2012.

4.8 Baseline Community Air Monitoring and Confirmatory Air Sampling

The community air monitoring program was implemented by Arcadis and generally included 1) real-time air monitoring for VOCs and respirable dust (particulate matter less than 10 micrometers in diameter [PM10]) and 2) confirmatory air sampling for VOCs and PAHs. The scope and results of the community air monitoring program are presented in the *Community Air Monitoring Report* (CAMR; Arcadis 2015), which is provided in Appendix E of this CCR. As described in the CAMR, real-time air monitoring was generally performed on a continuous basis (24 hours per day, seven days per week) using an automated perimeter monitoring system, and confirmatory air sampling was generally performed on a weekly basis to verify the real-time air monitoring results.

Arcadis air monitoring personnel and equipment were mobilized to the Site on July 10, 2012. Real-time air monitoring for VOCs and PM10 and confirmatory air sampling for VOC and PAHs were performed before ground-intrusive or dust-generating activities began at the Site to establish and document pre-remediation (baseline) ambient air concentrations. Baseline air monitoring was performed between July 12, 2012 and July 15, 2012, and baseline air sampling was performed on July 12, 2012. Information regarding the routine air monitoring and sampling performed during the remediation activities is provided in Section 6.10 of this CCR.

4.9 Mobilization and Site Preparation Activities

4.9.1 Mobilization

DAC personnel, equipment, materials, and incidentals were mobilized to the Site beginning on July 16, 2012. At that time, field offices for NYSDEC, Arcadis /GEI, and DAC personnel were also established within the O&R office building.

4.9.2 Pre-Construction Surveys and Inspections

4.9.2.1 Pre-Construction Survey

Thew Associates PE-LS, PLLC (Thew) performed a pre-construction survey on July 13, 2012 to: 1) document existing topographic conditions and features within the project work limits; 2) demarcate the horizontal limits of excavation; and 3) establish horizontal and vertical survey control. Survey control was maintained throughout the excavation, ISS, backfilling, and restoration activities to ensure the proper execution, construction, and documentation of the work.

The survey data collected by Thew before, during, and after the project were used by Arcadis to prepare the record drawings provided in Appendix F of this CCR.

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4.9.2.2 Pre-Construction Structural Inspections

Between July 17 and August 9, 2012, C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, PC (C.T. Male) performed inspections of the buildings/structures located at the following properties:

- 4 Brown Street (occupied two-story residential building);
- 8 Brown Street (occupied one-story residential building)
- 12 Brown Street (vacant three-story residential building);
- 14 Brown Street (vacant three-story residential building);
- 15 Brown Street and 26 King Street (occupied two-story residential building with attached commercial building);
- 21 King Street (vacant two-story residential building);
- 28 King Street (vacant two-story residential building);
- 30 King Street (vacant one-story structure);
- 2 Pike Street (vacant one- and two-story commercial building [former Flo-Jean's Restaurant]);
- 13 Pike Street (occupied two-story residential building);
- 15/17 Pike Street (vacant one-story residential building and detached one-story garage);
- 16 Pike Street (O&R office building and telecommunications building); and
- 21 Pike Street (occupied two-story commercial/residential building).

The locations of the above-listed properties are shown on Figure 2.

The inspections were performed to assess and document the pre-construction structural and cosmetic condition of the buildings/structures at and around the Site, with a particular focus on existing joints, cracks, foundation settlement, and areas of existing or on-going deterioration/damage.

4.9.2.3 Pre-Construction Sewer Inspection

On August 22, 2012, PipeLogix, Inc. performed a video inspection of the 36-inch diameter storm sewer line that passes beneath the Site to document its pre-construction condition. The pre-construction inspection video and report are provided in Appendix G of this CCR.

4.9.3 Utility Clearance and Mark-Out

DAC contacted Dig Safely New York and coordinated with O&R and the City of Port Jervis to 1) demarcate existing subsurface utilities in the area of the Site and 2) where necessary, disconnect, deactivate, or relocate active utilities that would be affected by the construction activities. Prior to commencement of demolition activities, DAC verified that all utilities servicing the 12/14 Pike Street building, 16 Pike Street garage bay, and 28 Pike Street building were properly deactivated and disconnected. Sanitary sewer and water lines servicing the 12/14 Pike Street and 28 Pike Street buildings

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were cut and capped outside the perimeter walls of the buildings. Natural gas and overhead power lines were disconnected by O&R, and the natural gas lines were cut back approximately 10 feet from the foundation line of each building. Cable and telephone lines were disconnected from each building and were secured to the nearest connecting utility pole.

Overhead power lines on the utility poles along Brown Street were relocated by O&R before the remediation activities were initiated. Natural gas lines in the vicinity of the Gas Holder A and Gas Holder D excavation areas were located and exposed by hand. During those activities, abandoned six-inch diameter and 12-inch diameter steel natural gas lines with suspected coal tar wrapping (an asbestos-containing material [ACM]) were encountered. Once verified by O&R to be inactive, the wrapping was removed by hand at 10-foot intervals along each gas line and the lines were cut (in the locations where the wrapping had been removed) and removed beyond the limits of excavation. The removed sections of abandoned gas piping were each wrapped in two layers of six-mil polyethylene sheeting.

Bulk samples of the wrapping on each pipe were collected by O&R to characterize the piping for disposal. Samples were analyzed by EMSL Analytical, Inc. for asbestos and polychlorinated biphenyls (PCBs). Testing confirmed the presence of asbestos in the wrapping on both pipes, and PCBs were detected at a concentration greater than the regulatory limit of 50 parts per million (ppm) in the bulk sample collected from the wrapping on the 12-inch diameter pipe. PCBs were not detected in the bulk sample collected from the wrapping on the six-inch diameter pipe.

The abandoned gas piping was loaded into a covered roll-off container lined with minimum six-mil polyethylene sheeting and was disposed of at the Chemical Waste Management, Inc. landfill in Emelle, Alabama on October 4, 2012. A copy of the shipping document is provided in Appendix H of this CCR.

4.9.4 Temporary Erosion and Sediment Controls

Temporary erosion and sediment controls, including silt fencing, hay bales, and storm drain inlet protection, were installed by DAC before any ground-intrusive activities were initiated. Thereafter, temporary erosion and sediment controls were inspected on a weekly or more frequent basis to verify their continued effectiveness and integrity. Any deficiencies observed during those inspections were promptly corrected by DAC.

4.9.5 Clearing and Site Access Controls

Existing surface features and stored materials, including bollards, utility poles, and transformers, were cleared from the work area by O&R and DAC to facilitate the construction activities. On the 12/14 Pike Street property, Midhurst Tree Care removed several trees that were located adjacent to the vacant apartment building.

Along Brown Street, the existing chain-link fencing and slide gate were removed, and temporary jersey-type concrete traffic barriers, chain-link fencing, and gates were installed to prevent access to the work area by unauthorized personnel and vehicles. Temporary six-foot high chain-link fencing was also installed around the 12/14 Pike Street and 28 Pike Street properties to demarcate and prevent unauthorized access to the regulated abatement work areas for the demolition activities. As required by 12 NYCRR 56-11.5(c)(2) and the asbestos variances granted by NYSDOL, the temporary fencing was set a minimum of 25 feet from each building except in the areas located along Pike Street and King Street. In

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those areas, temporary fencing was installed at the edge of the street. Temporary traffic control signage and devices were established on the streets and sidewalks surrounding the Site to maintain vehicular and pedestrian traffic and preserve the safety of motorists, workers, and pedestrians during the project.

In conjunction with the above activities, two NYSDEC-approved project signs were installed in prominent locations on Pike Street (in front of the O&R office building) and on Brown Street.

4.9.6 Sampling and Analysis of Off-Site Fill Materials

DAC's off-site sources of soil fill, run-of-bank gravel, crushed stone, and topsoil were sampled by Arcadis on July 26, 2012 (soil fill), August 17, 2012 (run-of-bank gravel and crushed stone), and September 10, 2012 (topsoil) to verify their suitability for use on the project. Representative samples of soil fill, run-of-bank gravel, and crushed stone were submitted to GeoTesting Express, Inc. for particle size analysis by ASTM D422. Samples of the soil fill and run-of-bank gravel were also analyzed for laboratory compaction characteristics by ASTM D698.

Two discrete (grab) samples and one composite sample of both soil fill and topsoil were collected and submitted to Accutest for chemical testing. Discrete samples were analyzed for VOCs by United States Environmental Protection Agency (USEPA) SW-846 Method 8260 and composite samples were analyzed for the following parameters:

- Semi-volatile organic compounds by USEPA SW-846 Method 8270;
- PCBs by USEPA SW-846 Method 8082;
- Pesticides by USEPA SW-846 Method 8081;
- Herbicides by USEPA SW-846 Method 8151;
- Metals by USEPA SW-846 Method 6010;
- Total mercury by USEPA SW-846 Method 7471;
- Total cyanide by USEPA SW-846 Method 9012;
- pH by USEPA SW-846 Method 9045 (topsoil only); and
- Total organic content by ASTM D2974 (topsoil only).

The chemical testing results were compared to either the commercial/industrial soil cleanup objectives (soil fill) or the restricted residential soil cleanup objectives (topsoil) set forth in 6 NYCRR 375-6.8(b) and included in Appendix 5 of DER-10.

The geotechnical and chemical testing results for DAC's off-site source of soil fill were submitted electronically to NYSDEC on August 20, 2012 and were approved on August 21, 2012. The geotechnical testing results for DAC's off-site source of run-of-bank gravel and crushed stone were submitted electronically to NYSDEC on August 24, 2013. The chemical testing results for DAC's off-site topsoil source were submitted electronically to NYSDEC on September 21, 2012 and were approved on that same date.

The geotechnical and chemical testing results for DAC's off-site fill materials are provided in Appendix I of this CCR.

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4.9.7 Background Asbestos Air Sampling

Background air sampling was performed by Omega on August 15, 2012 to establish existing airborne fiber concentrations before the controlled demolition activities were initiated at the 12/14 Pike Street and 28 Pike Street properties. The background sampling results are presented in Omega's *Air Sampling Report* (Air Sampling Report; Omega 2012), which is provided in Appendix J of this CCR.

5 BUILDING DEMOLITION ACTIVITIES

5.1 General

This section describes the building demolition and related activities performed at the Site and at the 12/14 Pike Street and 28 Pike Street properties between August and October 2012.

5.2 Universal Waste Removal

Regulated and non-regulated universal wastes, including cleaning supplies, fire extinguishers, smoke detectors, batteries, paint, and fluorescent light bulbs and ballasts, were removed from the 12/14 Pike Street and 28 Pike Street buildings by LVI before demolition activities were initiated. The universal wastes in the 28 Pike Street building were removed between August 2, 2012 and August 6, 2012, and the universal wastes in the 12/14 Pike Street building were removed between August 6, 2012 and August 7, 2012. In conjunction with these activities, LVI also removed a bedroom door with PCB-containing paint from the second floor of the 12/14 Pike Street building. Universal wastes were properly packaged, labeled, and stored on a temporary basis within a lined and bermed containment area located inside of the O&R office building.

Following the removal of the universal wastes, the 12/14 Pike Street and 28 Pike Street buildings were inspected by the City of Port Jervis Code Enforcement Officer, who subsequently issued letters of condemnation for those buildings on August 9, 2012 (as described in Section 4.6.2 of this CCR). The letters of condemnation were posted in prominent locations at the Site with the demolition permits and asbestos project documentation.

Universal wastes were transported off-site by Miller Environmental Group, Inc. on October 24, 2012, and were either disposed of or recycled, as appropriate, at the following facilities:

- Republic Environmental Systems (now, Phillips Services Corporation) in Hatfield, Pennsylvania;
- AERC Recycling Solutions in Allentown, Pennsylvania;
- Haight Fire Equipment Supply in Newburgh, New York; and
- First Alert in Aurora, Illinois.

A shipping document (hazardous waste manifest, non-hazardous waste manifest, or bill of lading, as appropriate) was prepared and signed by an authorized representative of O&R for each vehicle before it left the Site. Copies of those shipping documents are provided in Appendix K.

Refrigerators, freezers, and a portable air conditioning unit removed from the 12/14 Pike Street and 28 Pike Street buildings were staged in-tact on polyethylene sheeting outside of the O&R office building. The refrigerants were recovered by Armistead Mechanical, Inc. on October 11, 2012, and the refrigerators, freezers, and portable air conditioning unit were transported off-site to Taylor Recycling Facility, LLC (Taylor Recycling) in Montgomery, New York on October 18, 2012. A copy of the shipping document prepared for the refrigerators, freezers, and portable air conditioning unit is provided in Appendix L of this CCR with the shipping documents for the building demolition debris.

5.3 Building Demolition

5.3.1 16 Pike Street Garage Bay

The garage bay on the O&R office building was demolished by LVI between August 22, 2012 and August 28, 2012. The resulting demolition debris (48 tons) and scrap metal (nine tons) were processed, segregated, and loaded into roll-off containers using an excavator. The roll-off containers were transported off-site to the Taylor Recycling facility in Montgomery, New York on August 29, 2012 and August 31, 2012. A bill of lading was prepared for each roll-off container before it left the Site. Copies of those bills of lading are provided in Appendix L.

5.3.2 12/14 Pike Street and 28 Pike Street Buildings

The 12/14 Pike Street and 28 Pike Street buildings were demolished by LVI between September 6, 2012 and September 12, 2012 and between September 18, 2012, and September 26, 2012, respectively. Demolition was performed using controlled methods with the ACMs left in place in accordance with 12 NYCRR Part 56-11.5 and the asbestos variances granted by NYSDOL on August 1, 2012. Demolition debris was crushed, processed, and stockpiled within the foundation of each building using a long-reach excavator. During these activities, water hoses with spray nozzles and a high-volume fogging unit were used continuously to wet down demolition debris and control dust. Stockpiles were covered and secured with at least one layer of six-mil fire-retardant polyethylene sheeting at the end of each work day and during prolonged work stoppages.

Demolition debris was transported off-site for disposal as regulated ACM (RACM) at the Minerva Landfill in Waynesburg, Ohio. Prior to loading, the bed and sidewalls of each transport vehicle were lined with two layers of minimum six-mil fire-retardant polyethylene sheeting. The sheeting was draped loosely over the sides of the vehicle to prevent accidental contamination during loading. After each vehicle was loaded, the sheeting was wrapped loosely over the top of the load, and a non-mesh tarpaulin was secured over the top of the bed. The wheels and undercarriage were then inspected to identify (and remove, if necessary) visible soil or debris. A shipping document was prepared and signed by an authorized representative of O&R for each vehicle before it left the Site. Copies of those shipping documents are provided in Appendix L.

Upon completion of demolition and debris load-out, the basement and surrounding areas at both the 12/14 Pike Street and 28 Pike Street properties were raked, wet-swept, HEPA-filter vacuumed, and scraped clean to ensure the complete removal of any remaining ACMs. Once Omega verified that asbestos cleanup activities were complete, the foundation walls of each building were removed to a minimum depth of 12 inches below grade, and the basement foundation slabs (where present) were fractured in multiple locations to promote storm water infiltration and mitigate ponding. In conjunction with these activities, inactive natural gas, sanitary sewer, and water lines servicing each building were cut back and plugged at the edge of the sidewalk along Pike Street.

5.3.3 Summary

Table 2 below summarizes the disposal/recycling facilities used for the demolition debris (by building/structure) and the total estimated weight of debris disposed of or recycled at each facility.

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Table 2 Disposition of Building Demolition Debris

Waste Stream	Disposal/Recycling Facility	Estimated Weight (tons)
16 Pike Street Garage Bay		
Non-Regulated Demolition Debris	Taylor Recycling	48
Non-Regulated Scrap Metal	Taylor Recycling	9
12/14 Pike Street Building		
RACM	Minerva Landfill	158
28 Pike Street Building		
RACM	Minerva Landfill	656
Total:	--	871

Note:

Excluded from Table 2 are the refrigerators, freezers, and portable air conditioning unit (approximately five tons total) that were removed from the 12/14 Pike Street and 28 Pike Street buildings and disposed of at Taylor Recycling.

Copies of the shipping documents for each waste stream listed in Table 2 above are provided in Appendix L.

5.4 Backfilling and Restoration

The basements of the former 12/14 Pike Street and 28 Pike Street buildings were backfilled to within six inches of final grade with off-site soil fill. In-place density tests were performed by Atlantic Testing Laboratories, Limited (ATL) to confirm that the 95% compaction requirement had been achieved throughout the soil fill material. The basements and other disturbed areas at each property were restored to final grade with off-site topsoil, which was then seeded at a rate of approximately one pound per 1,000 square feet with a mixture of Kentucky bluegrass (40%), perennial ryegrass (35%), and creeping red fescue (25%). Seeded areas were covered with straw mulch, and silt fencing was installed and maintained until new grass was established. Existing concrete sidewalks along Pike Street that were damaged during the demolition activities were removed and replaced in-kind.

5.5 Air Sampling

Daily air sampling was performed by Omega during the controlled demolition of the 12/14 Pike Street and 28 Pike Street buildings. Air sampling logs, chains of custody, and sample results are presented in Omega's Air Sampling Report, which is provided in Appendix J of this CCR.

6 REMEDIATION ACTIVITIES

6.1 General

The remediation activities were performed within portions of the Site and 28 Pike Street property and generally involved the: 1) demolition and excavation/removal of certain former MGP structures; 2) excavation or ISS of “source area” soils located up to 20 feet bgs at the Site; and 3) excavation of surface soils located within the western portion of the 28 Pike Street property. These remediation activities were performed in substantial conformance with the following documents:

- ROD;
- Remedial Design, consisting of the Contract Drawings, Technical Specifications, Maintenance and Protection of Traffic Plan, Construction Quality Assurance Plan, Waste Management Plan, and Community Air Monitoring Plan;
- *Proposed Remedial Design Modification* (RD Modification; Arcadis 2012d);
- *Supplement to Remedial Design* (RD Supplement; Arcadis 2013a);
- Specification Section 02203 (titled “In-Situ Soil Mixing Solidification”) and DAC’s Soil Mixing Work Plan, which were submitted electronically to and approved by NYSDEC on January 30, 2013; and
- *Revised Approach for Excavation/ISS in Former Gas Holder A Area* (Revised Excavation/ISS Approach; Arcadis 2013c);
- *Proposal to Decommission Damaged On-Site Monitoring Wells* (Well Decommissioning Proposal; Arcadis 2013d); and
- *Proposed Modifications to Community Air Monitoring Program* (CAMP Modification; Arcadis 2013e).

Deviations from the Remedial Design are summarized in Section 6.13 below.

6.2 EPS Installation, Monitoring, and Removal

6.2.1 Installation

DAC encountered significant difficulties driving sheet piles to the required design elevation of 396.0 feet NAVD88 in the Gas Holder A area. The difficulties were attributed to a gravel layer underlying the Site that was generally encountered at an average depth of approximately 20 feet bgs. This gravel layer was characterized as a coarse-grained alluvium during the RI and consists of unconsolidated rock fragments, rounded cobbles, pebbles and boulders, silt, and sand. Because of the difficult driving conditions, DAC implemented several contingency measures and made good faith efforts, both before and during sheet pile driving, to achieve the required design elevation of 396.0 feet NAVD88. The specific contingency measures were documented in the RD Modification, and generally included the following:

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- Pre-trenching along the entire sheet pile alignment, generally to a depth of approximately six feet bgs, to identify and remove shallow obstructions;
- Pre-driving along the entire sheet pile alignment with a steel spud beam to a minimum elevation of 396.0 feet NAVD88 at the location of each sheet pile interlock to clear, dislodge, or otherwise break-up subsurface obstructions and provide additional information regarding difficult driving areas or depths;
- Pre-drilling those locations along the sheet pile alignment where refusal or difficult driving conditions were encountered during the pre-driving activities;
- Extracting and re-driving sheet piles upon refusal in an attempt to dislodge obstructions;
- Equipping sheet piles with steel cutting shoes to protect pile toes and improve penetration when driving with the vibratory hammer;
- Using a diesel impact hammer, or a combination of vibratory and diesel impact hammers, to drive sheet piles to the required design elevation; and
- Driving sheet piles equipped with cutting shoes, and using a combination of vibratory and diesel impact hammers (vibratory used until gravel layer encountered, then impact hammer used to drive through gravel layer).

These contingency measures were largely unsuccessful and also resulted in unacceptable noise/vibration levels, sheet pile damage, and schedule delays. O&R subsequently submitted the RD Modification on November 30, 2012, which identified three potential remedial alternatives for the Gas Holder A area and presented a comparative analysis of those potential alternatives in consideration of: 1) the remediation goals set forth in the ROD; 2) current Site conditions; 3) worker health and safety; and 4) community concerns. The recommended alternative generally included the following elements:

- Driving remaining sheet piles (using a vibratory hammer only) until refusal is encountered;
- Excavation of existing soil and debris to a depth of approximately 15 feet bgs (elevation 421.5 feet NAVD88);
- ISS of existing soils located between approximately 15 and 20 feet bgs (elevations 421.5 feet NAVD88 and 416.5 feet NAVD88, respectively); and
- Leaving in place steel sheet piling installed as part of the temporary EPS, and cutting the tops of the sheet piles several feet below final grade.

The RD Modification was approved by NYSDEC on December 11, 2012, and the remaining sheet piles were installed by December 13, 2012. The sheet pile installation records for the Gas Holder A area are provided in Appendix M of this CCR. The internal bracing for the EPS, which generally consisted of wales and struts, was installed in each cell once the sheet pile enclosure was completed.

Supplemental design information supporting the minor modification to the Remedial Design and selected remedy was presented in the RD Supplement, Specification Section 02203, and DAC's Soil Mixing Work Plan.

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6.2.2 Vibration Monitoring

Eight permanent remote seismograph systems equipped with triaxial geophones were installed at and around the Site to continuously monitor and record ground vibrations (specifically, peak particle velocity) during the sheet pile installation activities. Vibration monitoring was performed on behalf of DAC by Vibra-Tech Engineers, Inc. (Vibra-Tech) between August 1, 2012 and March 31, 2013. During that period, peak particle velocities did not exceed the project action level of 0.8 inch per second at any of the monitoring locations. Vibra-Tech's weekly vibration monitoring reports are provided in Appendix N of this CCR.

6.2.3 Sheet Pile Deflection Monitoring

Angular tiltmeters were mounted around the perimeter of the sheet pile enclosure to monitor sheet pile deflection during the excavation, ISS, and backfilling activities in the Gas Holder A area. Readings were generally collected twice per workday (in the morning and afternoon) until the cells were backfilled to within 5 feet of final grade.

6.2.4 Removal

The internal bracing for the EPS was removed once each cell was backfilled to within five feet of final grade. The steel sheet piles were then cut at an elevation of approximately 432.0 feet NAVD88 (47 inches below final grade) and the remaining portions (below elevation 432.0 feet NAVD88) were left in place in accordance with the RD Modification. The final sheet pile lengths and elevations are identified on the sheet pile installation records (Appendix M).

6.3 Interim Structural Inspections

Between December 12 and December 18, 2012, C.T. Male performed additional inspections of the buildings located at 4 Brown Street, 13 Pike Street, and 16 Pike Street (O&R office building only), and performed initial inspections of the buildings located at the following properties:

- 17 Brown Street (occupied two-story residential building);
- 9 Thompson Street (occupied two-story office building); and
- 14 Thompson Street (occupied two-story residential building).

The locations of the above-listed properties are shown on Figure 2.

The inspections were performed to assess and document the structural and cosmetic condition of each building and, for those buildings previously inspected by C.T. Male, to determine if any changes had occurred since the pre-construction inspections. There were no discernible changes in the conditions of the buildings/structures located at 4 Brown Street, 13 Pike Street, and 16 Pike Street.

6.4 Excavation

Excavations in each area were advanced to the horizontal and vertical limits shown or indicated on Record Drawing 2 (Appendix F). Asphalt pavement overlying the excavation areas was saw-cut, removed, and transported off-site for recycling at the Taylor Recycling facility in Montgomery, New York.

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To the extent practicable, excavated soils and debris were loaded directly into transport vehicles for off-site treatment/disposal at either the 1) ESMI of New York, LLC (ESMI) LTDD facility in Fort Edward, New York, or 2) Bayshore Soil Management, LLC (Bayshore) LTDD facility in Keasbey, New Jersey. In instances when direct loading was not practicable (e.g., due to scheduling, the availability of transport vehicles, etc.), temporary stockpiles and staging areas were used. The final horizontal and vertical limits of excavation in each area were surveyed by Thew and approved by NYSDEC's on-site representative before backfilling activities were initiated.

Table 3 below summarizes the approximate volume and disposition (off-site treatment/disposal or on-site re-use) of material excavated from each area during the remediation activities.

Table 3 Excavation Summary

Excavation Area	Average Depth of Excavation (feet bgs)	Approximate Excavation Volume (cy)		
		Off-Site Treatment/Disposal	On-Site Re-Use as Subsurface Backfill	Total
Gas Holder A	14.8	3,060	465	3,525
Gas Holder C	3.6	577	0	577
Gas Holder D	2.5	604	0	604
Purifier T	2.8	161	0	161
Tar Separator O	1.5	20	0	20
Buried Tank	8.0	134	0	134
28 Pike Street	2.1	6	0	6
Total:	--	4,562	465	5,027

Before loading excavated soils and debris, the bed and sidewalls of each transport vehicle were lined with polyethylene sheeting. After each vehicle was loaded, a non-mesh tarpaulin was secured over the top of the bed, and the wheels and undercarriage were inspected to identify (and remove, if necessary) visible soil or debris. A non-hazardous waste manifest was prepared and signed by an authorized representative of O&R for each vehicle before it left the Site. Copies of those shipping documents are provided in Appendix O. Truck traffic, both to and from the Site, followed the designated truck route identified in the *Maintenance and Protection of Traffic Plan* (Appendix C of the Remedial Design).

6.4.1 Gas Holder A Area

Soil and debris in Cells 1 and 2 were initially excavated to an interim elevation of approximately 423.0 feet NAVD88 to facilitate the ISS activities described in Section 6.5 below. An additional 1.5 feet of soil was subsequently excavated from Cell 2 in conjunction with the ISS activities in that cell. Within Cell 1, soils surrounding the former holder foundation were ultimately excavated to an elevation of 421.5 feet NAVD88. Soil and debris located within the footprint of the foundation were excavated, and the floor of the foundation was removed to an elevation of approximately 418.9 feet NAVD88. The perimeter ring wall of the former holder foundation was left in place below an elevation of approximately 421.5 feet NAVD88 (Record Drawings 3 and 4 in Appendix F).

Existing soils generally located between six and 10 feet bgs in the Gas Holder A area, which had been approved by NYSDEC for re-use on-site as subsurface backfill, were visually inspected by Arcadis and

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NYSDEC's on-site representative during the excavation activities to verify the absence of coal tar. Once excavated, re-use soils were temporarily stockpiled on polyethylene sheeting within or adjacent to the excavation areas, and were covered with polyethylene sheeting when no loading or unloading activities were occurring.

6.4.2 Gas Holder C and Gas Holder D Areas

The foundations of former Gas Holders C and D were demolished and removed in their entirety. Excavated debris (e.g., concrete, brick, etc.) was broken-up/down-sized as required by the disposal facilities. There were no visible indications of the presence of MGP-related impacts in the soils located below the foundations.

6.4.3 Purifier T Area

The Purifier T area was uncovered and found to consist of a shallow reinforced concrete foundation, which was demolished and removed in its entirety. Excavated debris (e.g., concrete, rebar, etc.) was broken-up/down-sized as required by the disposal facilities. There were no visible indications of the presence of MGP-related impacts within the foundation itself, nor in the soils located below the foundation.

6.4.4 Tar Separator O Area

Tar Separator O was uncovered to within approximately six feet of the edge of the loading dock on the O&R office building. The roof overhang and concerns regarding the structural stability of the building in this area prevented excavation any closer to the loading dock. The interior of the exposed portion of the former separator was divided into six holding chambers by a series of intersecting reinforced concrete walls (consistent with observations made during the PDI). The chambers contained coal tar-impacted fill, debris, and standing water.

The contents of each chamber were removed and the interior surfaces were cleaned to the satisfaction of NYSDEC using a combination of wet (power washing) and dry decontamination methods. The separator itself, a portion of which appeared to extend below the loading dock of the O&R office building, was left in place following NYSDEC's acceptance of the decontamination effort.

6.4.5 Buried Tank Area

While implementing the contingency measures for the sheet pile installation activities, two previously unknown USTs were encountered in the vicinity of the Brown Street entrance gate to the Site. The first UST was located within the limits of Cell 1 (Gas Holder A area) and was found to have been previously decommissioned (the top of the tank had been removed and the tank had been filled with crushed stone and gravel). The UST and its contents were excavated/removed in conjunction with the excavation activities in the Gas Holder A area. There were no visible indications of the presence of MGP- or petroleum-related impacts in the soils surrounding the first UST.

The second UST was located southwest of Cell 1 in the area identified as "Buried Tank Area" on Record Drawing 2 in Appendix F. The UST was empty and appeared to be in-tact. The interior of the UST and the surrounding soils were field screened with a photoionization detector for the presence of VOC vapors, but

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none were detected. The UST and surrounding soils were excavated/removed and transported off-site for disposal. There were no visible indications of the presence of MGP- or petroleum-related impacts in the soils surrounding the second UST.

6.4.6 28 Pike Street Area

The excavation activities at the 28 Pike Street property were performed on April 26, 2013 and involved the excavation of existing surface soils in the western corner of the property to a depth of two feet bgs.

6.5 In-Situ Soil Solidification

Existing soils located between elevations 421.5 feet NAVD88 and 416.5 feet NAVD88 in Cells 1 and 2 of the Gas Holder A excavation area (approximately 860 cy) were mixed and solidified in-place in accordance with Specification Section 02203, DAC's Soil Mixing Work Plan, and the Revised Excavation/ISS Approach. Cells 1 and 2 of the Gas Holder A area were subdivided into a series of soil mixing cells for the ISS activities. Those soil mixing cells are depicted on Figure P-1 in Appendix P of this CCR. Also provided in Appendix P are DAC's daily soil mixing reports, which document the soil mixing cell(s) completed each day and the mix proportions for each soil mixing cell.

The soil mixing program was designed to achieve, at 28 days, an 1) unconfined compressive strength (UCS) of between 50 and 500 pounds per square inch (psi) and 2) hydraulic conductivity of less than 1.0×10^{-6} centimeters per second. The soil mix design consisted of 10% Portland cement (Type I/II) and 0.5% bentonite by weight, which were proportioned and added in dry form to the existing soils in each soil mixing cell. An excavator was used to loosen, dig, fold, and blend the soil and amendments to achieve a homogeneous soil-cement mixture within each soil mixing cell. Adjacent mixing cells were overlapped by a minimum of one foot to ensure the complete solidification of soils within the ISS area.

Within Cell 1, ISS activities were initiated in the soil mixing cells surrounding the former holder foundation, which were each mixed and solidified in-place between elevations 421.5 feet NAVD88 and 416.5 feet NAVD88. Soil and debris located within the footprint of the foundation itself were excavated and transported off-site for disposal, and the floor of the foundation was completely exposed to assess its condition and construction. Once exposed, the foundation floor was broken up with a hoe ram and loaded out for off-site disposal. Existing soils underlying the foundation were then mixed and solidified in-place between elevations 418.9 feet NAVD88 and 416.5 feet NAVD88. The perimeter ring wall of the former holder foundation was left in place below elevation 421.5 feet NAVD88 (Record Drawings 3 and 4 in Appendix F).

Quality control testing was performed by Arcadis on a daily basis during the soil mixing activities. Samples of the freshly-mixed soil were collected and visually inspected to assess homogeneity and consistency with other soil mixing cells. Test specimens were prepared, field-cured, and submitted to Geotechnics, Inc. for UCS and hydraulic conductivity testing by ASTM D1633 and ASTM D5084, respectively, in accordance with Specification Section 02203. The geotechnical testing reports are provided in Appendix P of this CCR and demonstrate that the ISS performance criteria were met or surpassed in each soil mixing cell.

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6.6 Backfilling

Upon completion of ISS activities, Cells 1 and Cell 2 of the Gas Holder A area were each backfilled to within one foot of final grade with a combination of compacted re-use soils and off-site soil fill. Re-use soils were generally placed at depths between six feet and 15 feet bgs in each cell. The Gas Holder C, Gas Holder D, Purifier T, and Buried Tank areas were each backfilled to within one foot of final grade with compacted off-site soil fill, and the 28 Pike Street area was backfilled to within six inches of final grade with compacted off-site soil fill. In-place density tests were performed by either ATL or Advance Testing Company, Inc. (ATC) at several locations within each excavation area to confirm that the 95% compaction requirement had been achieved throughout the soil fill material.

The exposed bays of Tar Separator O were backfilled with controlled low-strength material (CLSM) in accordance with the Remedial Design.

Table 4 below summarizes the approximate volume and type of material used to backfill each excavation area during the remediation activities.

Table 4 Backfilling Summary

Excavation Area	Approximate Backfill Volume (cy)			
	On-Site Re-Use Soil	Off-Site Soil Fill ¹	CLSM ¹	Total
Gas Holder A	465	2,823	0	3,288
Gas Holder C	0	416	0	416
Gas Holder D	0	363	0	363
Purifier T	0	104	0	104
Tar Separator O	0	0	20	20
Buried Tank	0	117	0	117
28 Pike Street	0	5	0	5
Total:	465	3,828	20	4,313

Note:

1. As indicated in Table 1 (Section 3), all off-site fill materials (including soil fill and CLSM) were obtained from Dick's Concrete Company, Inc. of Port Jervis, New York.

6.7 Monitoring Well Decommissioning

Monitoring wells GRMW1, GRMW2, MW3S, MW3D, and MW5 were significantly damaged during the building demolition and remediation activities, and were decommissioned without replacement on May 8, 2013 in accordance with the NYSDEC-approved Well Decommissioning Proposal and NYSDEC's CP-43. Decommissioning was performed on behalf of DAC by Aquifer Drilling and Testing, Inc. The former locations of monitoring wells GRMW1, GRMW2, MW3S, MW3D, and MW5 are shown on Figure 2 and the decommissioning logs are provided in Appendix C of this CCR.

6.8 Site Restoration and Demobilization

6.8.1 Surface Restoration

Following the completion of backfilling activities within the on-site excavation areas, a woven geotextile fabric was installed above the compacted soil fill material and eight inches of compacted subbase material (run-of-bank gravel) was placed. The subbase material was fine-graded and surveyed by Thew to confirm that the excavation areas had been brought to within four inches of final grade. In-place density tests were performed by ATC at several locations within each excavation area to confirm that the 95% compaction requirement had been achieved throughout the subbase material.

On-site excavation areas were restored to final grade with four inches of new asphalt pavement, which consisted of a 2.5-inch New York State Department of Transportation (NYSDOT) Type 3 binder course and a 1.5-inch NYSDOT Type 6 top course. Existing asphalt pavement located outside of the limits of excavation was saw-cut and removed to the underlying subbase course, and was replaced with a new 2.5-inch NYSDOT Type 3 binder course and a 1.5-inch NYSDOT Type 6 top course. Asphalt debris was transported off-site for recycling at the Taylor Recycling facility in Montgomery, New York.

The 28 Pike Street excavation area was restored to final grade with six inches of off-site topsoil. As described in Section 5.4, the 12/14 Pike Street and 28 Pike Street properties were seeded at a rate of approximately one pound per 1,000 square feet with a mixture of Kentucky bluegrass (40%), perennial ryegrass (35%), and creeping red fescue (25%). Seeded areas were covered with straw mulch, and silt fencing was installed and maintained until new grass was established.

New chain-link fencing was installed along Brown Street and between the Site and 28 Pike Street property to replace the existing fencing that was removed during the site preparation activities. A new slide gate was also installed along Brown Street as part of the restoration activities.

The approximate extent of new asphalt pavement, lawns, and fencing is shown on Record Drawing 5 in Appendix F.

6.8.2 Post-Construction Surveys and Inspections

6.8.2.1 Post-Construction Sewer Inspection

On May 2, 2013, Precision Industrial Maintenance, Inc. performed a post-construction video inspection of the 36-inch diameter storm sewer line that passes beneath the Site. The conditions observed during the post-construction inspection were generally consistent with those observed during the pre-construction inspection. The post-construction inspection video and report are provided in Appendix G of this CCR.

6.8.2.2 Post-Construction Structural Inspections

Between May 6 and May 28, 2013, C.T. Male performed post-construction inspections of the buildings/structures located at the following properties:

- 4 Brown Street (occupied two-story residential building);
- 8 Brown Street (occupied one-story residential building)

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- 12 Brown Street (vacant three-story residential building);
- 14 Brown Street (vacant three-story residential building);
- 15 Brown Street and 26 King Street (occupied two-story residential building with attached commercial building);
- 17 Brown Street (occupied two-story residential building);
- 21 King Street (vacant two-story residential building);
- 28 King Street (vacant two-story residential building);
- 30 King Street (vacant one-story structure);
- 2 Pike Street (vacant one- and two-story commercial building [former Flo-Jean's Restaurant]);
- 13 Pike Street (occupied two-story residential building);
- 15/17 Pike Street (occupied one-story residential building and detached one-story garage);
- 16 Pike Street (O&R office building and telecommunications building);
- 21 Pike Street (occupied two-story commercial/residential building);
- 9 Thompson Street (occupied two-story office building); and
- 14 Thompson Street (occupied two-story residential building).

The locations of the above-listed properties are shown on Figure 2.

The inspections were performed to 1) assess and document the post-construction structural and cosmetic condition of each building/structure and 2) determine if any changes had occurred since the pre-construction/interim inspections. With the exception of the 2 Pike Street building, which sustained some damage during and as a result of Hurricane Sandy (fall 2012), the pre-construction, interim (where applicable), and post-construction conditions of each building/structure were nearly identical.

6.8.2.3 Post-Construction Survey

Thew performed a post-construction survey on June 17, 2013 to document the final (as-built) topographic conditions and features within the project work limits. Those conditions are depicted on Record Drawing 5 in Appendix F of this CCR.

6.8.3 Demobilization

Following confirmation that all restoration activities had been completed, DAC demobilized the remaining personnel, equipment, materials, and temporary facilities from the Site. The demobilization activities were substantially complete by the end of June 2013.

6.8.4 Sidewalk Replacement

Following DAC's demobilization from the Site, Verticon Ltd. demolished and removed the existing sidewalks surrounding the Site along Pike, Brown, and King Streets and along a portion of Water Street,

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and installed new concrete sidewalks. The sidewalk replacement activities were substantially complete by November 2013. The approximate extent of new concrete sidewalks is shown on Record Drawing 5 in Appendix F.

6.9 Odor, Vapor, and Dust Control

The primary means of controlling odor, vapor, and dust emissions during the remediation activities was the use of a TFS, which was erected above the Gas Holder A area following the installation of the EPS. The TFS was equipped with a negative-pressure air treatment system that generally consisted of 1) a blower (fan) unit with particulate filters and 2) an activated carbon adsorption vessel with approximately 16,000 pounds of vapor-phase granular activated carbon. Design details for the TFS and air treatment system were provided electronically to NYSDEC on October 29, 2012. The TFS and air treatment system were decontaminated, dismantled, and demobilized from the Site by April 26, 2013.

Other odor, vapor, and dust controls were proactively employed during the remediation activities to limit the potential for odor, vapor, and dust emissions from the Site. Such controls included, but were not limited to, the following:

- Covering material stockpiles when no loading or unloading activities were occurring;
- Spraying BioSolve solution on soils during active excavation/load-out activities;
- Periodically foaming excavation faces/excavated soils before work breaks and at the end of the work day;
- Removing soil and debris from, and spraying water on, active haul routes;
- Hauling excavated materials and clean backfill materials in properly tarped/covered transport vehicles; and
- Restricting vehicle speeds on-site and on active haul routes.

6.10 Community Air Monitoring

As described in Section 4.8, the community air monitoring program was implemented on behalf of O&R by Arcadis, and generally included 1) real-time air monitoring for VOCs and PM10 and 2) confirmatory air sampling for VOCs and PAHs. Routine real-time air monitoring for VOCs and PM10 was performed on a continuous basis (24 hours per day, seven days per week) between July 16, 2012 and April 18, 2013. Beginning on April 19, 2013, real-time air monitoring for VOCs was discontinued and real-time air monitoring for PM10 was performed during work hours only in accordance with the CAMP Modification.

As described in the CAMR (Appendix E), there were six exceedances of the PM10 action level (0.150 micrograms per cubic meter) and no exceedances of the benzene and total VOC action levels (one ppm and five ppm, respectively) during the project. For each PM10 exceedance, the following actions were taken:

- NYSDEC's on-site representative was promptly notified (in real-time);
- Corrective measures were implemented by DAC; and

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- The exceedance was documented in the daily and weekly air monitoring reports, which were submitted to NYSDEC and NYSDOH throughout the project.

Routine air sampling for VOCs and PAHs was initiated on July 20, 2012 and, with the exception of a scheduled work shut down during the week of December 23, 2012, was performed on a weekly basis through April 11, 2013. Confirmatory air sampling was discontinued after the April 11, 2013 sampling event in accordance with the CAMP Modification. The daily and weekly air monitoring reports and confirmatory air sampling data for the project are provided in the CAMR (Appendix E).

6.11 BioSolve Spill

On October 17, 2012, approximately 100 gallons of 3% BioSolve solution (a non-hazardous, biodegradable surfactant) leaked from a portable storage tank and entered a storm drain on the Site that discharges to the Delaware River. The cause of the spill (a faulty hose connection) was identified and corrected by 7:30 a.m. on October 18, 2012, and the spill (NYSDEC Spill Number 1207107) was reported to NYSDEC at 4:36 p.m. on October 18, 2012. The spill case was closed-out by NYSDEC on October 19, 2012.

6.12 Construction Waste Management

6.12.1 Excavated Soil and Debris

A total of 9,342 tons of soil and debris was transported off-site for treatment/disposal or recycling during the remediation activities. Table 5 below summarizes the disposal/recycling facilities used on the project (by waste type) and the total estimated weight of material disposed of or recycled at each facility.

Table 5 Disposition of Remediation Waste

Waste Stream	Disposal/Recycling Facility	Estimated Weight (tons)
Excavated Soil and Debris	ESMI	5,774
Excavated Soil and Debris	Bayshore	2,968
Asphalt Debris	Taylor Recycling	600
Total:	--	9,342

Copies of the non-hazardous waste manifests/documentation for the disposal or recycling of each waste stream listed in Table 5 above are provided in Appendix O.

6.12.2 Construction Wastewater

Approximately 20,780 gallons of construction wastewater (consisting primarily of groundwater and decontamination wash water) was generated during the project. Wastewater was stored on a temporary basis in frac tanks, which were staged on-site within a fully-lined containment area. Construction wastewater was ultimately transported off-site for treatment/disposal at the Clean Waters of New York, Inc. facility in Staten Island, New York. Copies of the non-hazardous waste manifests for each shipment are provided in Appendix Q.

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6.13 Deviations from Remedial Design

The following is a summary of the deviations from the Remedial Design:

1. As described in Section 6.2.1, a NYSDEC-approved alternate remedy was implemented for the Gas Holder A area that generally included: a) excavation of existing soil and debris to a depth of approximately 15 feet bgs (elevation 421.5 feet NAVD88); b) ISS of existing soils located between approximately 15 and 20 feet bgs (elevations 421.5 feet NAVD88 and 416.5 feet NAVD88, respectively); and c) leaving in place steel sheet piling installed as part of the temporary EPS, and cutting the tops of the sheet piles several feet below final grade. The alternate remedy for the Gas Holder A area was implemented in accordance with the RD Modification, RD Supplement, Revised Excavation/ISS Approach, Specification Section 02203, and DAC's Soil Mixing Work Plan.
2. Documentation samples were not collected from the sidewalls and bottoms of the excavation areas to document the concentrations of MGP-related contamination remaining at the Site. The change in the remedial approach for the Gas Holder A area (ISS of soils between approximately 15 and 20 feet bgs and permanent sheet piling) prevented documentation samples from being collected from the sidewalls and bottom of that excavation area. In the case of Tar Separator O, documentation samples were not collected since that structure was filled with CLSM and abandoned in place. For the other excavation areas, there were no visible indications of the presence of MGP-related impacts in the soils located below or surrounding the structures removed during the project.
3. The majority of the test specimens collected during the ISS activities had a 28-day UCS that was greater than the ISS performance criteria of 50 to 500 psi. The increased strength of the ISS monolith will not adversely affect the effectiveness of the remedy.
4. Subgrades within an approximately 44-foot wide by 60-foot long area in Cell 1 of the Gas Holder A excavation area displayed pronounced elasticity or cracking during proof-rolling. The elasticity and cracking were due to unsuitable (wet) backfill material located between approximately six and 10.5 feet bgs. Existing backfill material located in the unstable area of Cell 1 was excavated to a depth of approximately six feet bgs and stockpiled for re-use. Wet backfill material generally located between approximately six and 10.5 feet bgs was blended in-place with a mixture of six- to nine-inch diameter surge stone, and the area was re-compacted and proof-rolled. Dry backfill material previously excavated from the top six feet of the unstable area of Cell 1 was blended with crushed stone, and was placed and compacted from six feet bgs to within two feet of final grade. A woven geotextile fabric was then installed and 20 inches of subbase material was placed and compacted to within four inches of final grade. A roughly 30-foot by 30-foot area continued to exhibit unacceptable elasticity upon proof-rolling and was subsequently a) undercut by four inches (to a total depth of eight inches below final grade) and b) restored to final grade with eight inches of new asphalt pavement, consisting of a four-inch NYSDOT Type 1 base course, a 2.5-inch NYSDOT Type 3 binder, and a 1.5-inch NYSDOT Type 6 top course. The remainder of the unstable area of Cell 1 was restored to final grade with four inches of new asphalt pavement as described in Section 6.8.1 above.
5. The CLSM used as backfill within the Tar Separator O area had an average 28-day UCS of 360 psi instead of the 50 to 150 psi specified in the Remedial Design. The increased strength of the CLSM backfill used on the project will not adversely affect the effectiveness of the remedy.

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6. Beginning on April 19, 2013, real-time air monitoring for VOCs was discontinued and real-time air monitoring for PM10 was performed during work hours only in accordance with the CAMP Modification.
7. Monitoring wells GRMW1, GRMW2, MW3S, MW3D, and MW5 were significantly damaged during the building demolition and remediation activities, and were decommissioned without replacement on May 8, 2013 in accordance with the NYSDEC-approved Well Decommissioning Proposal and NYSDEC's CP-43.
8. The asphalt pavement described in Section 6.8.1 above was constructed with a NYSDOT Type 3 binder course in lieu of the NYSDOT Type 1 base course specified in the Remedial Design. The change in paving material was made in consideration of the future use and function of the pavement at the Site as a parking/storage area and surface cover.

All other project activities were performed in substantial conformance with the Remedial Design.

7 OFF-SITE NAPL RECOVERY ACTIVITIES

7.1 General

This section summarizes the NAPL recovery and related activities conducted in the off-site area during and following the construction activities.

7.2 NAPL Recovery Well Construction Study

Between March and June 2013, a NAPL recovery well construction study was conducted at the off-site 1/9 Pike Street property in accordance with the NYSDEC-approved *NAPL Recovery Well Construction Study Work Plan* (Arcadis 2013b). The objective of the study was to evaluate two different drilling and two different well construction methods in an attempt to optimize off-site NAPL recovery. The study involved the installation of four pilot NAPL recovery wells (identified as RW-1 through RW-4) between March 5 and March 25, 2013 and, following installation and development, weekly collection of static fluid-level measurements over a period of approximately two months to monitor for NAPL accumulation. As described in the *NAPL Recovery Well Construction Study Summary Report* (Arcadis 2013f), no measurable amounts of NAPL were observed in any of the recovery wells during the two-month monitoring period. The locations of recovery wells RW-1 through RW-4 are shown on Figure 2 and the construction logs are provided in Appendix R.

7.3 Angled NAPL Recovery Wells

The angled NAPL recovery installation work was performed in accordance with the *NAPL Recovery Work Plan* (Arcadis 2014a), which was approved by NYSDEC on May 1, 2014. The primary goal of the program was to determine if recoverable quantities of NAPL were present beneath Pike Street through the drilling of angled soil borings. If, through discussions with O&R and NYSDEC, it was determined that visual observations of NAPL in those borings were deemed to be recoverable, then NAPL recovery wells were to be installed.

The drilling and subsequent well installation activities were completed between August 5 and August 15, 2014. Based on observations made during the drilling work, five angled NAPL recovery wells were installed. As shown on Figure 2, two recovery wells (RW-5 and RW-6) were installed at the off-site 1/9 Pike Street property, one recovery well (RW-7) was installed at the off-site 6 Pike Street property, and two recovery wells (RW-8S and RW-8D) were installed at the off-site 12/14 Pike Street property. The scope and results of the angled recovery well installation activities were presented in a November 10, 2014 letter to NYSDEC titled *NAPL Recovery Well Installation, Monitoring, and Reporting* (Arcadis 2014b). The construction logs for recovery wells RW-5, RW-6, RW-7, RW-8S, and RW-8D are provided in Appendix R.

Following the installation and development of the recovery wells, a periodic NAPL monitoring program was initiated to monitor for, and subsequently remove accumulated NAPL, if present. The monitoring program included the newly-installed angled recovery wells (RW-5, RW-6, RW-7, RW-8S, and RW-8D), as well as existing recovery wells RW-1 through RW-4 and existing monitoring wells MW-7R and MW-8R. In accordance with the *NAPL Recovery Work Plan*, four weekly monitoring events were conducted on August 26, September 2, September 9, and September 16, 2014. Subsequent monthly monitoring events

CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

were conducted in October 2014 through July 2019. As of the date of this CCR, the monthly NAPL monitoring and removal program is currently ongoing. Monitoring well MW-8R is the only well that is producing NAPL at this time. Since August 26, 2014, approximately 160 gallons of NAPL have been removed from monitoring well MW-8R.

8 POST-CONSTRUCTION ACTIVITIES

8.1 General

This section identifies the activities to be performed following the completion of construction, including the construction of a groundwater treatment system, the execution, and recording of an environmental easement for the Site and the preparation of a SMP.

8.2 Groundwater Treatment System

As required by the ROD, O&R will construct a groundwater treatment system downgradient of the site on the O&R owned 1 – 9 Pike St. (Meder) property. The groundwater will be treated by enhanced aerobic biodegradation of the contaminants. The air sparge and soil vapor extraction groundwater treatment system will be installed in accordance with the NYSDEC-approved *Remedial Design* (Arcadis 2017).

8.3 Environmental Easement

As required by the ROD, O&R will execute an environmental easement for the Site that will: 1) limit the use and development of the property to commercial or industrial use; 2) require compliance with the approved SMP; 3) restrict the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH; and 4) require the property owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls.

8.4 Site Management Plan

O&R will prepare a SMP to describe the post-remediation monitoring, inspection, certification, and reporting requirements for the Site. In accordance with Section 6.2 of DER-10, the SMP will include: 1) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls on the Site and details the steps and media-specific requirements necessary to assure that the institutional and/or engineering controls remain in place and effective; and 2) a Monitoring Plan to assess the performance and effectiveness of the remedy.

CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION

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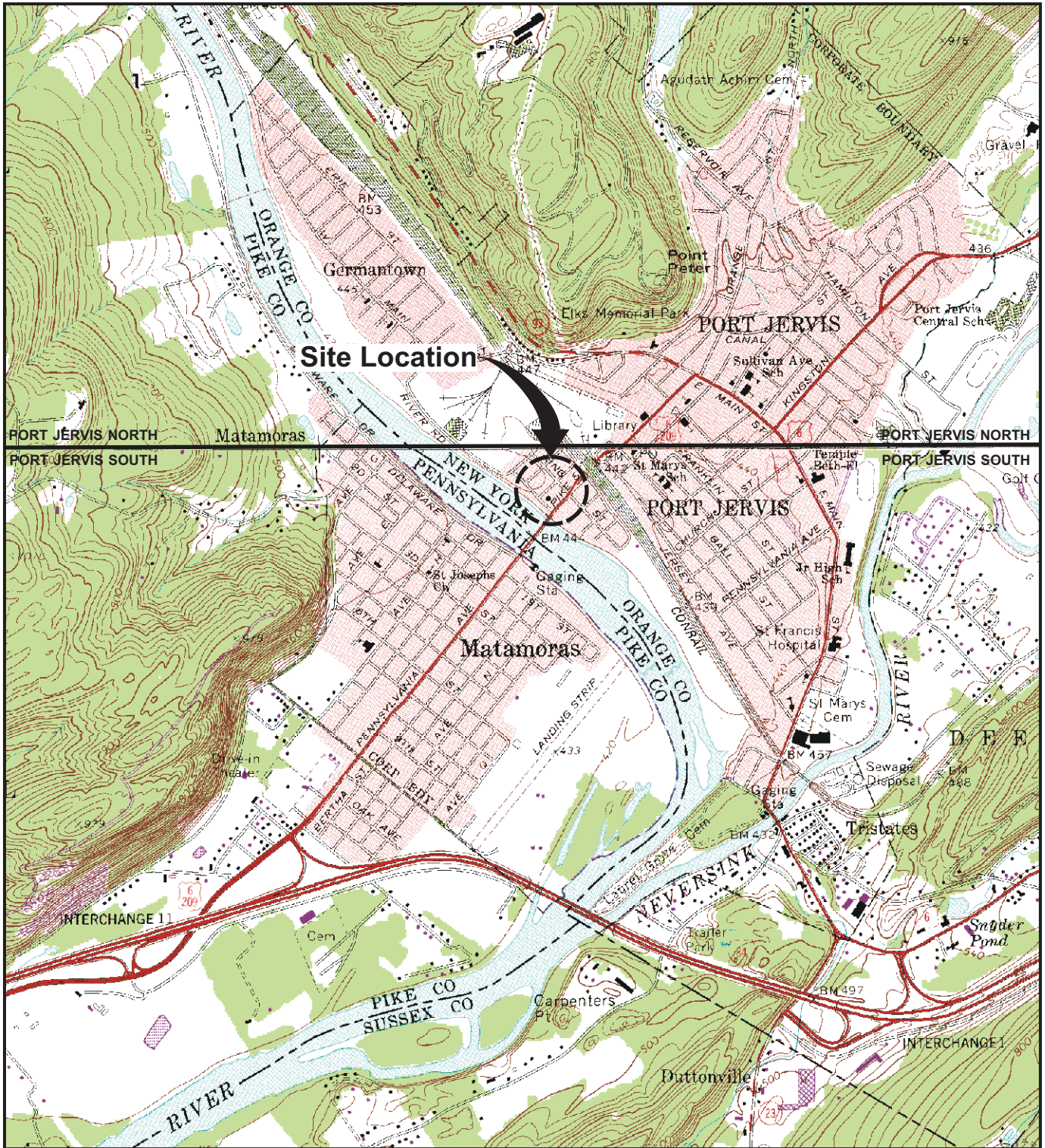
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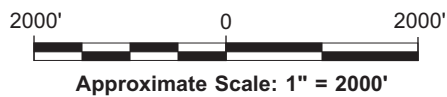
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FIGURES



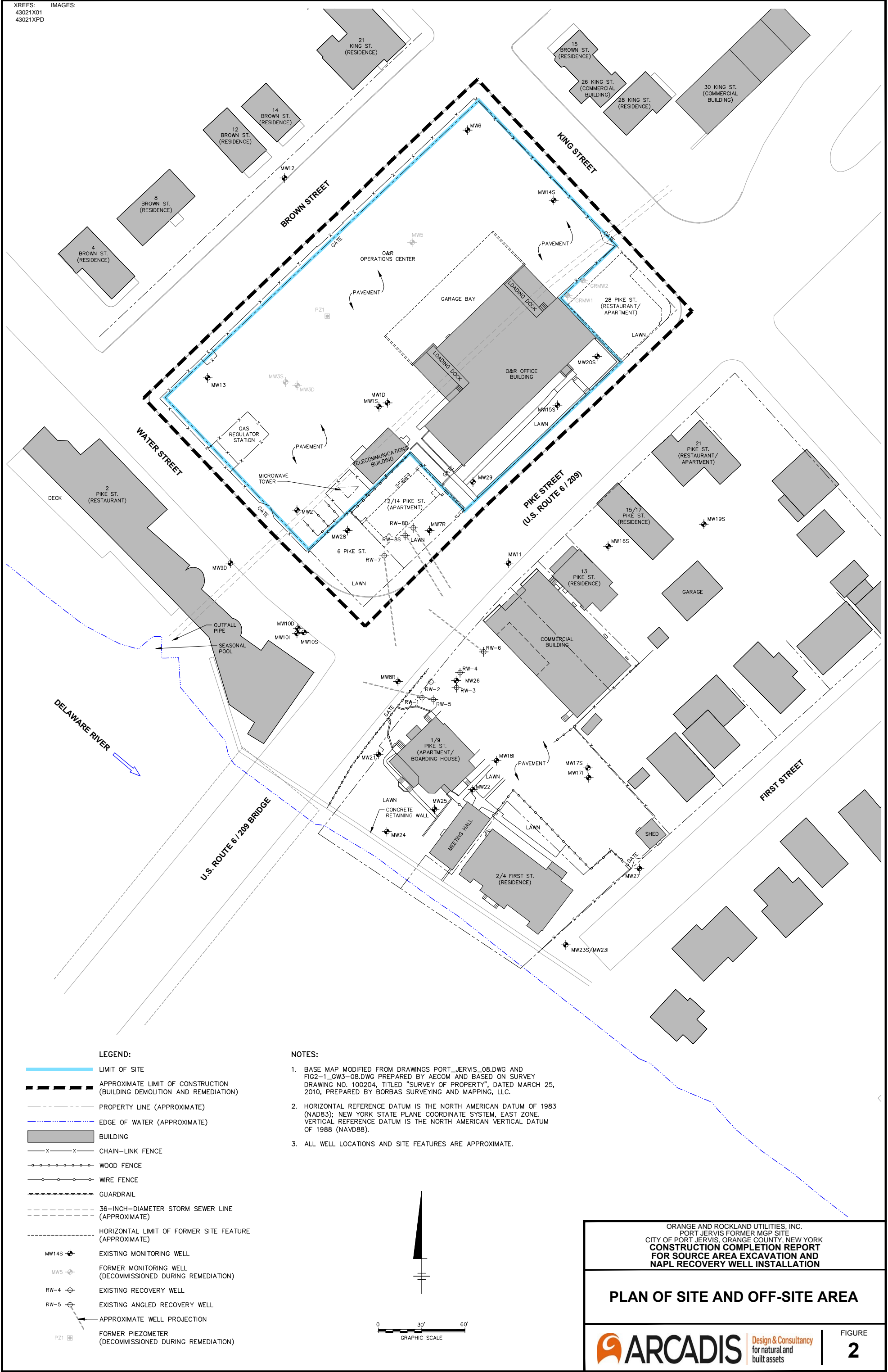


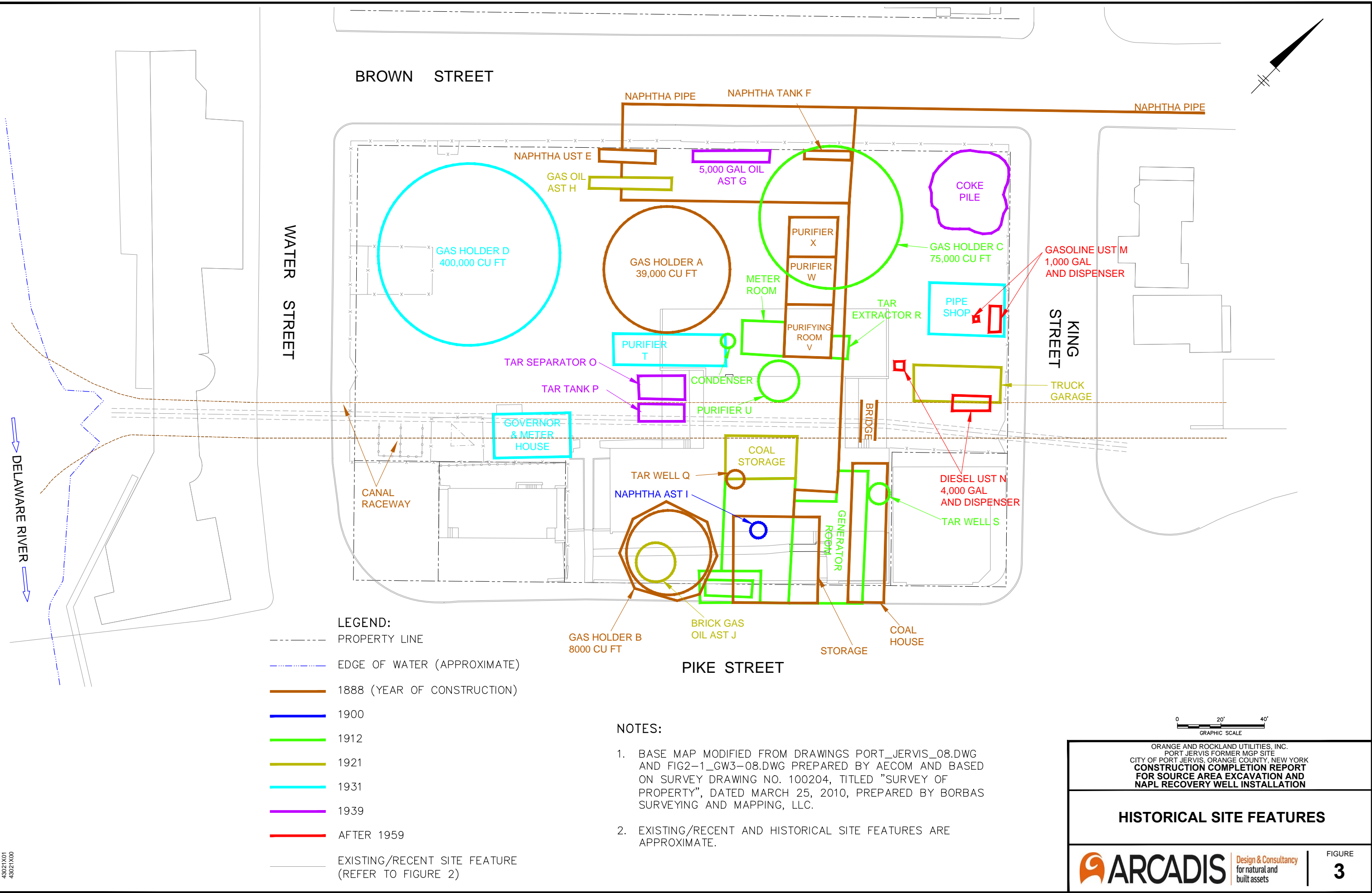
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 PORT JERVIS SOUTH, NY-NJ-PA., 1969, PHOTOREVISED 1983.



ORANGE AND ROCKLAND UTILITIES, INC. PORT JERVIS FORMER MGP SITE CITY OF PORT JERVIS, ORANGE COUNTY, NEW YORK CONSTRUCTION COMPLETION REPORT FOR SOURCE AREA EXCAVATION AND NAPL RECOVERY WELL INSTALLATION	
SITE LOCATION MAP	
	Design & Consultancy for natural and built assets
FIGURE 1	

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APPENDIX F

Record Drawings



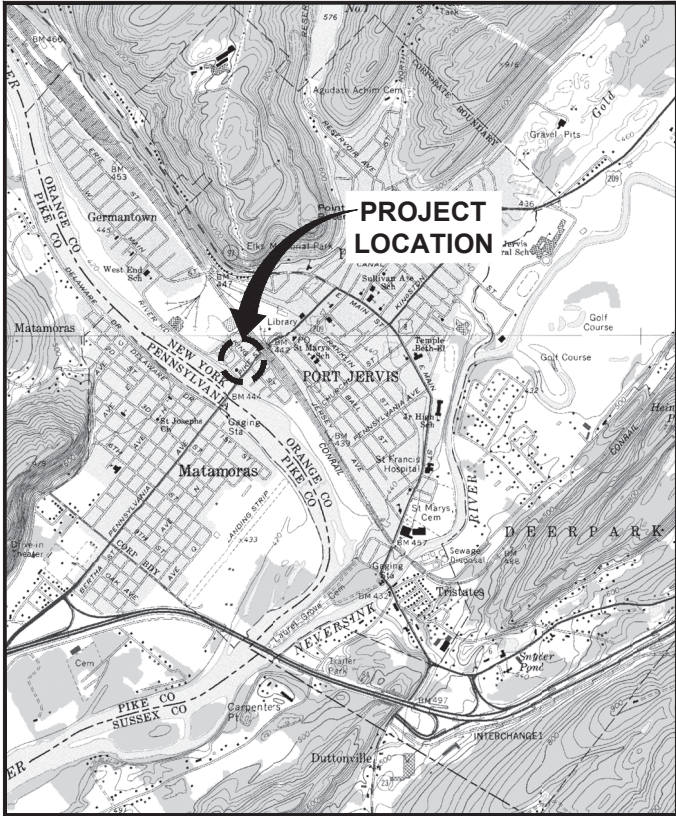
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Benoit B&W Signature Transparent.png
Benoit NYS PE Seal_088936.jpg

RECORD DRAWINGS

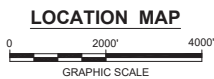
SOURCE AREA EXCAVATION

PORT JERVIS FORMER MANUFACTURED GAS PLANT SITE

CITY OF PORT JERVIS, ORANGE COUNTY, NEW YORK



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE, PORT JERVIS
NORTH AND SOUTH, NY-NJ-PA., 1969. PHOTOREVISED 1983.



DATE ISSUED
SEPTEMBER 2019


GOSHEN, NEW YORK



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for natural and built assets

ARCADIS OF NEW YORK, INC.

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LIST OF DRAWINGS

- 1 COVER SHEET, LOCATION MAP, AND LIST OF DRAWINGS
- 2 PHASE 1 EXCAVATION PLAN
- 3 PHASE 2 EXCAVATION AND IN-SITU SOIL SOLIDIFICATION PLAN
- 4 PHASE 2 EXCAVATION AND IN-SITU SOIL SOLIDIFICATION SECTIONS
- 5 SITE RESTORATION PLAN

NOTES:

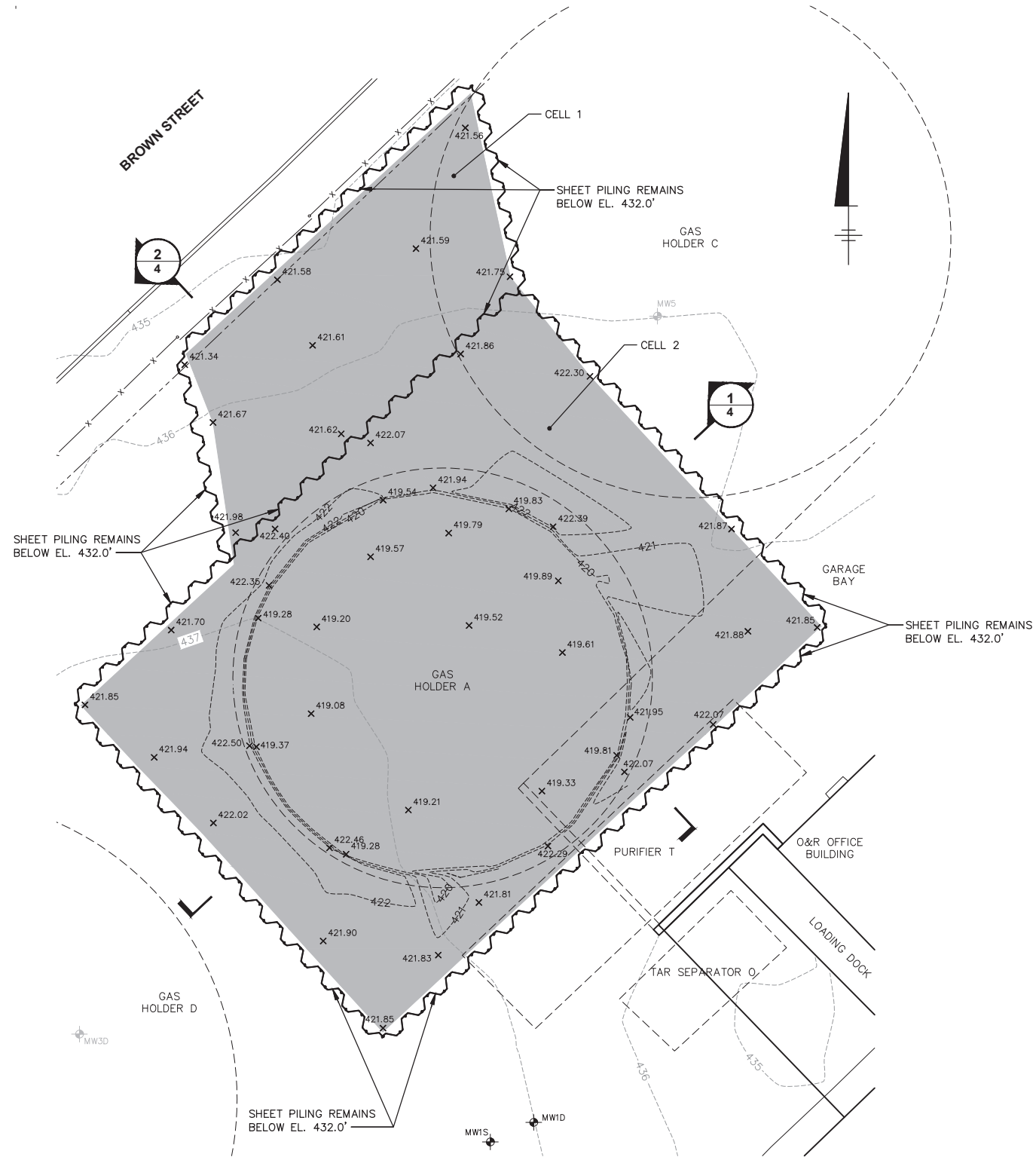
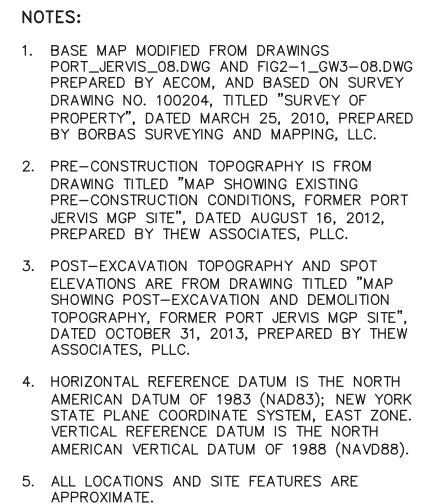
1. BASE MAP MODIFIED FROM DRAWINGS PORT_JERVIS_08.DWG AND FIG2-1_GW3-08.DWG PREPARED BY AECOM, AND BASED ON SURVEY DRAWING NO. 100204, TITLED "SURVEY OF PROPERTY", DATED MARCH 25, 2010, PREPARED BY BORBAS SURVEYING AND MAPPING, LLC.
2. PRE-CONSTRUCTION TOPOGRAPHY IS FROM DRAWING TITLED "MAP SHOWING EXISTING PRE-CONSTRUCTION CONDITIONS, FORMER PORT JERVIS MGP SITE", DATED AUGUST 16, 2012, PREPARED BY THEW ASSOCIATES, PLLC.
3. EXCAVATION LIMITS, POST-EXCAVATION TOPOGRAPHY AND SPOT ELEVATIONS, AND EXCAVATION VOLUMES ARE FROM DRAWING TITLED "MAP SHOWING POST-EXCAVATION AND DEMOLITION TOPOGRAPHY, FORMER PORT JERVIS MGP SITE", DATED OCTOBER 31, 2013, PREPARED BY THEW ASSOCIATES, PLLC.
4. HORIZONTAL REFERENCE DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD83); NEW YORK STATE PLANE COORDINATE SYSTEM, EAST ZONE. VERTICAL REFERENCE DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88).
5. ALL LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

ARCADIS Project No.
30005361.00001

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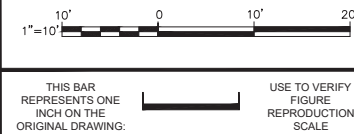
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NY 13202-1355
TEL. 315.446.9120

XREFS:	IMAGES:
43021X01	Benoit B&V
43021X05	Benoit B&V
PJ-Titleblock-1	Benoit NY



RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT THE
PROJECT AS CONSTRUCTED.

DATE 09/11/2019 BY *MJ*

[illegible]

Professional Engineer's Name		
MICHAEL J. BENOIT		
Professional Engineer's No.		
088936		
State	Date Signed	Project Mgr.
NY	09/11/2019	MAF
Designed by	Drawn by	Checked by
MJB	BGG	MAF



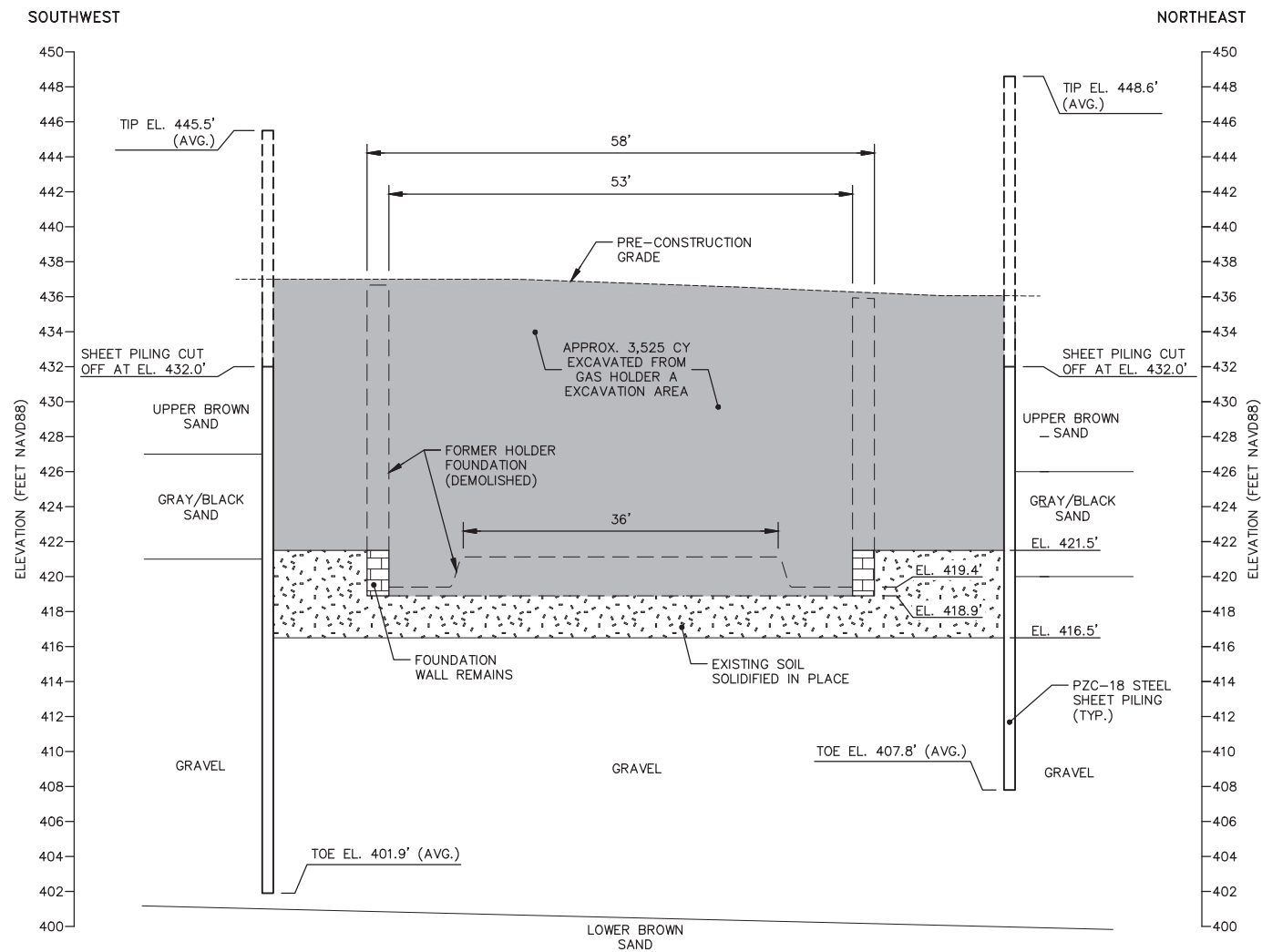
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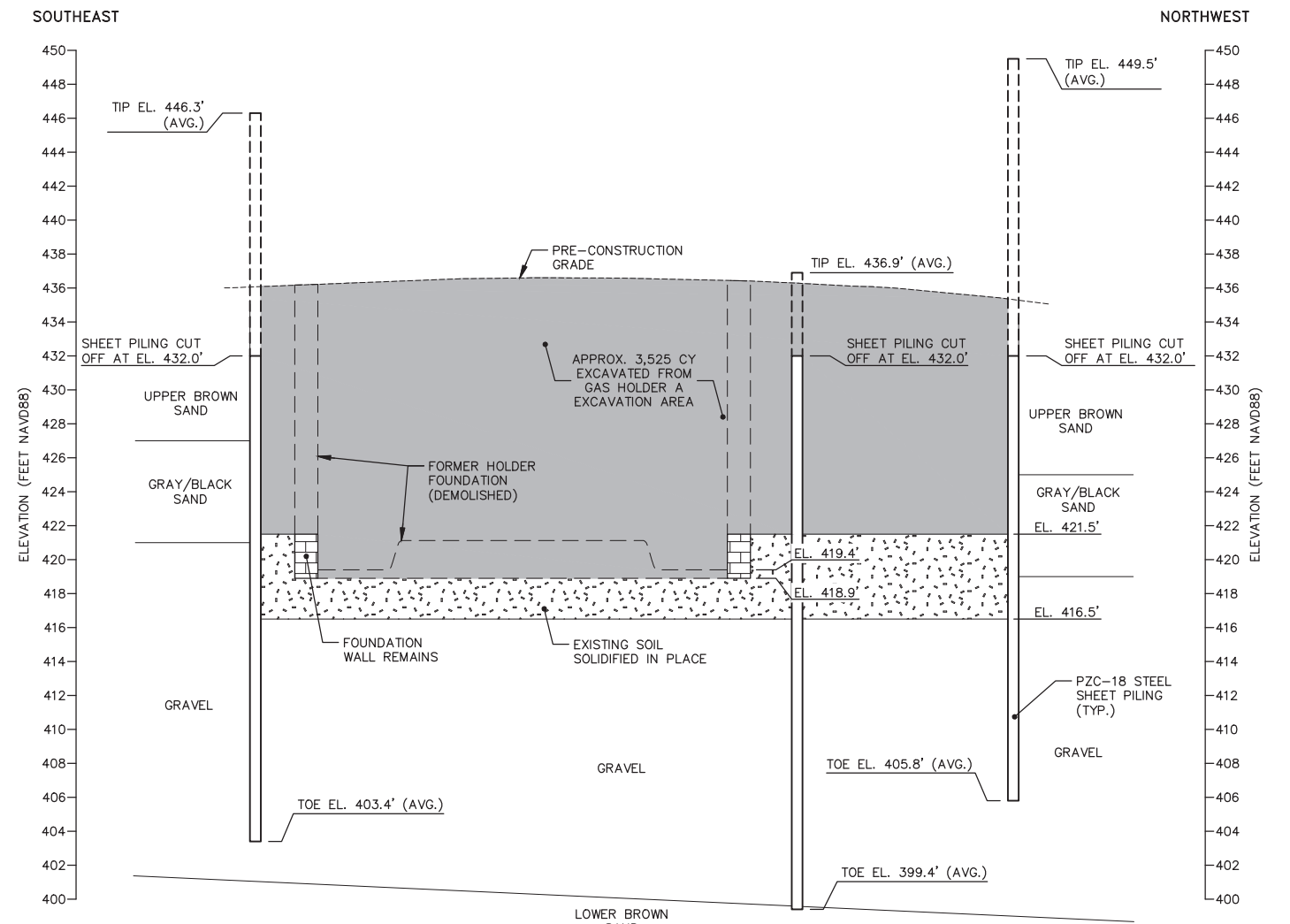
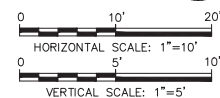
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PORT JERVIS FORMER MANUFACTURED GAS PLANT SITE
CITY OF PORT JERVIS, ORANGE COUNTY, NEW YORK
SOURCE AREA EXCAVATION

PHASE 2 EXCAVATION AND IN-SITU SOIL SOLIDIFICATION PLAN

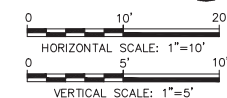
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SECTION 1



SECTION 2



NOTES:

1. PRE-CONSTRUCTION TOPOGRAPHY IS FROM DRAWING TITLED "MAP SHOWING EXISTING PRE-CONSTRUCTION CONDITIONS, FORMER PORT JERVIS MGP SITE", DATED AUGUST 16, 2012, PREPARED BY THEW ASSOCIATES, PLLC.
2. EXCAVATION VOLUME IS FROM DRAWING TITLED "MAP SHOWING POST-EXCAVATION AND DEMOLITION TOPOGRAPHY, FORMER PORT JERVIS MGP SITE", DATED OCTOBER 31, 2013, PREPARED BY THEW ASSOCIATES, PLLC.
3. HORIZONTAL REFERENCE DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD83); NEW YORK STATE PLANE COORDINATE SYSTEM, EAST ZONE. VERTICAL REFERENCE DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88).
4. GEOTECHNICAL INFORMATION SHOWN OR INDICATED ON THIS DRAWING IS APPROXIMATE AND BASED ON DATA OBTAINED DURING PREVIOUS SITE INVESTIGATIONS.
5. ALL LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT THE
PROJECT AS CONSTRUCTED.

DATE 09/11/2019 BY MJL

SCALE(S) AS INDICATED						Professional Engineer's Name		
						MICHAEL J. BENOIT		
						Professional Engineer's No.		
						088936		
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.	USE TO VERIFY FIGURE REPRODUCTION SCALE	Revisions		By	Ckd	State	Date Signed	Project Mgr.
		No.	Date			NY	09/11/2019	MAF
THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.						Designed by	Drawn by	Checked by
						MJB	BGG	MAF





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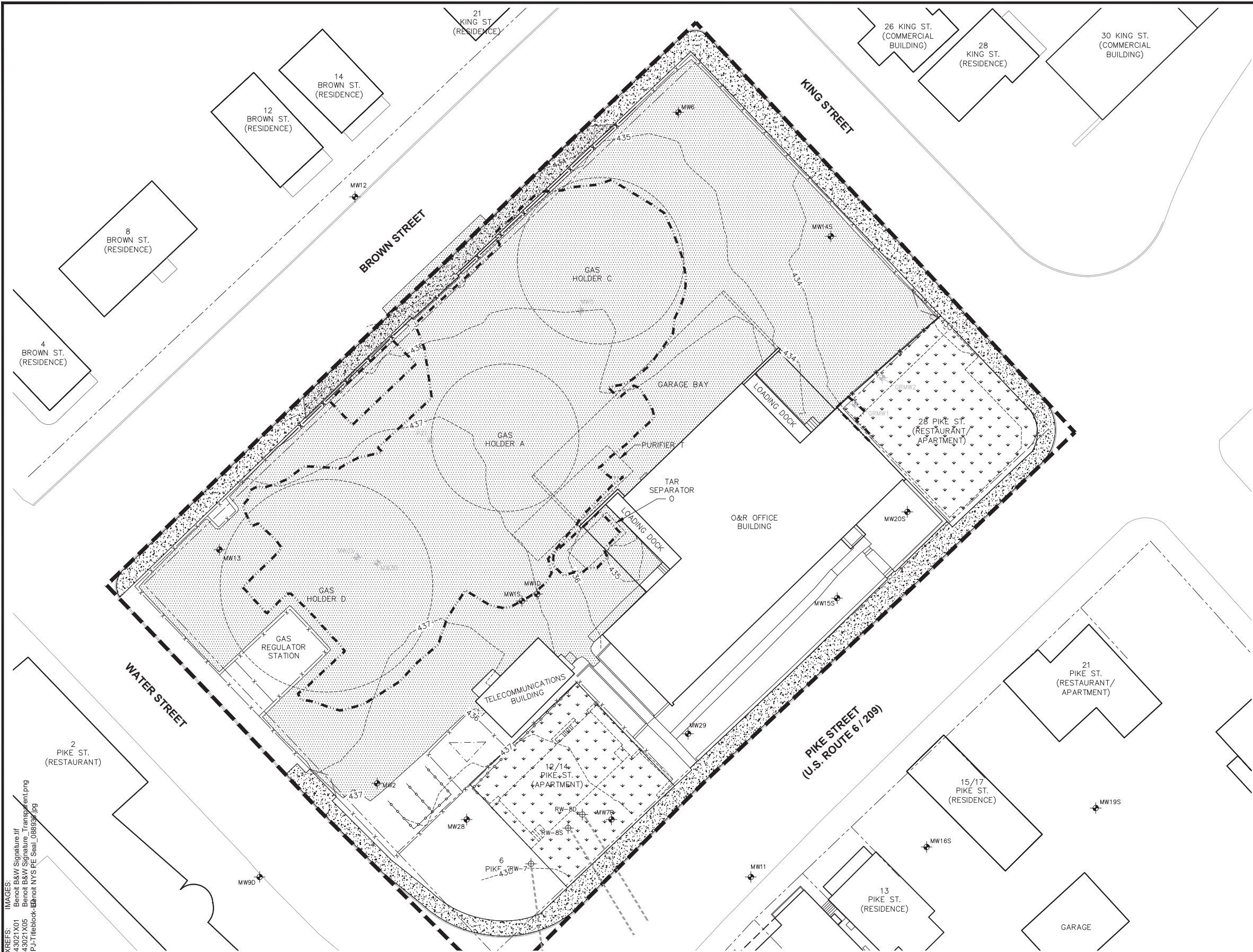
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PORT JERVIS FORMER MANUFACTURED GAS PLANT SITE
CITY OF PORT JERVIS, ORANGE COUNTY, NEW YORK
SOURCE AREA EXCAVATION

PHASE 2 EXCAVATION AND IN-SITU SOIL SOLIDIFICATION SECTIONS

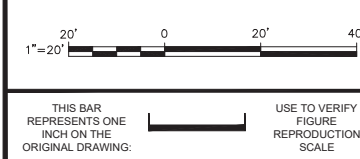
ARCADIS Project No. 30005361.00001	4
Date SEPTEMBER 2019	
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- LEGEND:**
- PROJECT WORK LIMIT
 - PROPERTY LINE (APPROXIMATE)
 - EDGE OF BUILDING
 - POST-CONSTRUCTION TOPOGRAPHIC CONTOUR (1-FOOT INTERVAL)
 - EXISTING CHAIN-LINK FENCE
 - EXISTING WOOD FENCE
 - HORIZONTAL LIMIT OF FORMER SITE FEATURE (APPROXIMATE)
 - EXISTING MONITORING WELL
 - EXISTING ANGLED RECOVERY WELL
 - APPROXIMATE WELL PROJECTION
 - FORMER MONITORING WELL (DECOMMISSIONED DURING REMEDIATION)
 - FORMER PIEZOMETER (DECOMMISSIONED DURING REMEDIATION)
 - HORIZONTAL LIMIT OF EXCAVATION
 - NEW CHAIN-LINK FENCE
 - NEW ASPHALT PAVEMENT
 - NEW LAWN
 - NEW CONCRETE SIDEWALK

- NOTES:**
- BASE MAP MODIFIED FROM DRAWINGS PORT_JERVIS_08.DWG AND FIG2-1_GW3-08.DWG PREPARED BY AECOM, AND BASED ON SURVEY DRAWING NO. 100204, TITLED "SURVEY OF PROPERTY", DATED MARCH 25, 2010, PREPARED BY BORBAS SURVEYING AND MAPPING, LLC.
 - EXCAVATION LIMITS AND POST-CONSTRUCTION CONDITIONS ARE FROM DRAWING TITLED "MAP SHOWING FINAL AS-BUILT TOPOGRAPHY, FORMER PORT JERVIS MGP SITE", DATED MARCH 14, 2014, PREPARED BY THEW ASSOCIATES, PLLC.
 - HORIZONTAL REFERENCE DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD83); NEW YORK STATE PLANE COORDINATE SYSTEM, EAST ZONE. VERTICAL REFERENCE DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
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No.	Date	Revisions	By	Ckd

Professional Engineer's Name
MICHAEL J. BENOIT
Professional Engineer's No.
088936
State
NY
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Designed by
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SOURCE AREA EXCAVATION

SITE RESTORATION PLAN

ARCADIS Project No.
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Date
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A decorative graphic consisting of three thin orange lines. One line is horizontal, extending from the left edge of the page towards the right. Two other lines are diagonal, starting from the bottom left and extending towards the top right, intersecting the horizontal line.