REVISED ALTERNATIVES ANALYSIS REPORT FOR THE FORMER WEST 45TH STREET GAS WORKS SITE – OPERABLE UNIT 2

Site #231109

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AUGUST 2017

REVISED NOVEMBER 2020

Certification

"I certify that this Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER10) and that all activities were performed in full accordance with the DER approved work plan and any DER approved modifications."

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Engineer's Seal Date

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LIST OF ACRONYMS

µg/L	Micrograms Per Liter
AAR	Alternatives Analysis Report
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CAMP	Community Air Monitoring Plan
CCP	Citizen Participation Plan
Con Edison	Consolidated Edison Company of New York, Inc.
CSCO	Commercial Use Soil Cleanup Objective
DNAPL	Dense Nonaqueous Phase Liquid
DSR	Data Summary Report
GWQS	Ground Water Quality Standards
HASP	Health and Safety Plan
ISS	*In situ* Stabilization and Solidification
MGP	Manufactured Gas Plant
MTBE	Methyl tert-butyl ether
MW	Monitoring Well
NAPL	Non-Aqueous Phase Liquid
NYCRR	New York Codes Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OU	Operable Unit
PAH	Polyaromatic Hydrocarbons
PDI	Pre-Design Investigation
PID	Photoionization Detector
ppm	Parts Per Million
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
SC	Site Characterization
SCG	Standards, Criteria, and Guidance Values
SCO	Soil Cleanup Objectives
SCR	Site Characterization Report
Site	Manhattan In New York City, New York

LIST OF ACRONYMS - CONTINUED

SMP	Site Management Plan
SVOC	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristics Leaching Procedure
TMV	Toxicity, Mobility, or Volume
TOGS	Technical and Operational Guidance Series
TP	Test Pit
USCO	Unrestricted use Soil Cleanup Objective
USCS	Unified Soil Classification System
VCA	Volunteer Cleanup Agreement
VOC	Volatile Organic Compounds
WQS	Water Quality Standards

SECTION 1.0

INTRODUCTION

On behalf of Consolidated Edison Company of New York, Inc. (Con Edison), this Alternatives Analysis Report (AAR) for Operable Unit 2 (OU-2) of the Former West 45th Street Gas Works Site has been prepared. The Former West 45th Street Gas Works Site is located in the borough of Manhattan in New York City, New York (Site) (Figure 1). For characterization purposes, the Site was divided into two distinct areas, designated as Operable Unit 1 (OU-1) and OU-2 as shown in Figure 2. This AAR focuses only on the OU-2 portion of the Site. The purpose of this AAR is to evaluate appropriate remedial alternatives, identify effective and implementable alternatives that address the manufactured gas plant (MGP)-related compounds present at the Site, and to present the remedy selected by the New York State Department of Environmental Conservation (NYSDEC). The remedy was selected by the NYSDEC following review of the draft AAR submitted in August, 2017.

The Site is currently developed as a parking lot for the Intrepid Sea, Air and Space Museum and owned by the New York State Department of Transportation (NYSDOT). A pedestrian bridge over State Route 9A provides access to the Intrepid Sea, Air and Space Museum. Currently, the Site is covered with asphalt and pavement.

The various remediation investigation activities previously conducted at the Site were carried out and completed pursuant to the terms of Volunteer Cleanup Agreement (VCA) between Con Edison and the NYSDEC. The Site transitioned from the VCA to an Order on Consent on July 25, 2018 (Site #231109). A Site Characterization Report (SCR) for the Former West 45th Street Works Site (OU-2) was prepared in December 2003. Subsequent to the SCR, additional field work was conducted and the results were documented in a May 2006 Data Summary Report (DSR). Additional field investigation activities were conducted in 2012 in order to prepare a Pre-Design Investigation Report (PDI), which is attached as Appendix A. Data contained in these three reports provide the basis for the development of this AAR. This AAR has been prepared in accordance with the requirements set forth in *6 New York Codes Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs* (6 NYCRR 375) and the NYSDEC's *Technical Guidance for Site Investigation and Remediation* (DER 10) (NYSDEC, 2010).

1.1 SITE DESCRIPTION AND HISTORY

A complete history of the former MGP site operation is presented in a report entitled *West 45th Street Gas Works Site History Report* (Parsons, 2002). A general overview of the site history is provided herein.

The Site was part of the West 45th Street Gas Works Site which was present on portions of the city blocks from 44th to 46th Street, between 11th Avenue and the Hudson River. Former MGP structures located on OU-2 included two gasholders and associated structures, and a purifying house. The plant operated from 1877 to the mid–1890s using the coal gas process prior to switching to a carbureted gas process. Although most of the buildings and structures associated with the

MGP facility were removed in 1913, the large tar-sealed gasholder located at OU-2 was used until 1965. The height of the large gasholder appears to have increased from 90 feet in 1911 to 276 feet in 1930, expanding the holder's capacity from 2,000,000 cubic feet to 7,000,000 cubic feet before being decommissioned and demolished in the mid-1960s. The subsurface remnants of the gasholders are still believed to be present. Following demolition of the aboveground structures, Con Edison used the Site for heavy equipment storage and a parking lot. In 1995, Con Edison constructed a natural gas refueling station on the northeast corner of OU-2 which is no longer present today. In 2000, the NYSDOT acquired the Site from Con Edison. The existing zone for the Site based on the New York City Planning Commission Zoning Map 8c (Appendix B) is a manufacturing district.

1.2 ALTERNATIVES ANALYSIS REPORT ORGANIZATION

This AAR has been organized in accordance with DER-10's Section 4.5(c)3 as follows:

- Section 1 – Introduction;
- Section 2 – Site Investigation Summary;
- Section 3 – Exposure Assessment;
- Section 4 – Remedial Goals, Remedial Action Objectives, and SCGs;
- Section 5 – Development and Evaluation of Remedial Alternatives;
- Section 6 – Comparative Analysis of Remedial Alternatives;
- Section 7 – NYSDEC Selected Remedy; and
- Section 8 – References.

SECTION 2.0

SITE INVESTIGATION SUMMARY

Investigations have been conducted at OU-2 to characterize MGP related impacts in soil, groundwater and soil vapor media. These investigations included SC activities in 2003 and 2006, and PDI activities in 2012. Soil boring, soil vapor, test pit (TP) and groundwater monitoring well (MW) locations completed at the Site are presented on Figure 3. The data collected during these investigations are presented in the SCR, DSR, and PDI (Parsons, 2003, 2006, and 2012).

2.1 SITE GEOLOGY

The bedrock underlying the Site is the Manhattan Formation, composed of gray to black mica schist that has been intensely folded and deformed by two major geologic episodes of mountain building during the Paleozoic Era, more than 200 million years ago. The depth of the bedrock surface in the mid to lower west Manhattan area varies from more than 150 feet below ground level in the Chelsea section to near the surface in the Clinton area (AKRF, 1994).

Soil borings advanced during SC and PDI field activities were conducted in order to characterize subsurface conditions. Bedrock was encountered at significantly varying depths during the SC and PDI, and can be generally categorized as gneissic schist to schist. Table 1 and Figure 4 detail bedrock elevations based on soil boring and test pit locations. Bedrock highs above 15 feet below ground surface (bgs) were observed in the northwestern, northeastern, and southwestern corners of the Site. A bedrock high is observed between 12.5 and 16 feet bgs in the center of the Site, directly below the interior portion of the former large gas holder. The bottom of the large gasholder appears to be a combination of concrete and bedrock. Bedrock depths encountered within the large gasholder appear to be deeper along the perimeter of the holder (between 35 and 45 feet bgs), forming a bedrock trough in a ring shape around the entirety of the bedrock high. Cross sections which transverse the Site from east to west and from north to south are shown on Figures 5 through 8.

The evolution of the Hudson River is complex, and a number of theories to explain its development exist. Geologists theorize the current course of the river was established 10 to 20 million years ago. During the past 35,000 years of the Pleistocene Epoch (the Ice Age), bedrock has been abraded and eroded by four episodes of glaciations. During the Wisconsonian Stage (the last of the four glacial stages), large volumes of sand, gravel, and rock have been deposited along the margins of the Hudson River Valley (AKRF, 1994).

These original sedimentary deposits that underlie the Site as well as much of the rest of the region include poorly sorted glacial deposits (till); ancient beach sand; organic materials, such as peat, wood fragments, and shells; and riverine silt and clay. Since the settlement of the metropolitan area, these natural deposits under the Site have been covered with miscellaneous fill up to 45 feet thick, primarily comprising ash, excavated soils, refuse, and general debris. Along much of the Route 9A corridor, the shoreline was built out into the Hudson River in stages. A relieving platform or bulkhead would be built and the area behind it filled with the excavated soils

and waste materials. As the bulkhead deteriorated over a period of time, a new structure would be built water ward of the existing structure, and fill placed behind the new structure. Some of the relieving platforms and bulkheads remain under the roadway.

2.2 SITE HYDROGEOLOGY

The groundwater of Manhattan is closely connected with the water bodies that surround the island. Although many factors affect the movement of groundwater through soil, gradients within the subsurface material are generally the most important of these. The permeability of soils and fill vary widely over a small distance in the Site; moreover, the abandoned bulkheads and subsurface structures also affect water movement. Increasing distance inland from the river decreases the influence of the river on groundwater. The exact groundwater flow conditions existing at any given place in the project corridor depend on the subsurface conditions at that particular location.

Manhattan's drinking water is obtained from reservoirs located greater than 25 miles north of the city. No drinking water supply wells were identified in the vicinity of the Site. The usage of local groundwater is not likely since the public water supply is readily available. Groundwater along the Route 9A corridor is generally brackish to saline, but is highly variable. Salinity has been recorded to be as low as 62 parts per million (ppm) chloride near West 26th Street and as high as 9,700 ppm chloride near the World Trade Center, which is approximately two miles south of the Site. NYSDEC regulations define saline groundwater as having a chloride concentration of more than 250 ppm or a total dissolved solids concentration of more than 1,000 ppm.

Groundwater levels have been collected at the Site in 2003, 2006, 2007, and 2012 via gauging events and tidal studies. Table 2 provides a summary of representative data from these events. Data from the 2003, 2006, and 2007 events were similar and indicate groundwater flow beneath the Site is to the west towards the Hudson River. Overall, groundwater maintains a general flow towards the west. The mounding effect observed within the footprint of the large gasholder has increased from 2003 to 2012. Figure 9 is a groundwater contour map based on the 2012 gauging event.

Artesian conditions were encountered during 2012 PDI activities at borings advanced within and adjacent to the southern and southwestern portions of the former large gas holder. Specifically, these conditions were observed during, and subsequent to, borehole advancement at CONT-5, CONT-7, PDI-18, PDI-21, PDI-22, PDI-26, MW-23, MW-24, and PW-1. Additionally, former MW-5, located in the southwestern portion of the former large gas holder, became artesian subsequent to its redevelopment. As presented in Table 2, groundwater levels measured in MW-5, MW-24, and PW-1 were above grade. Hydraulic conductivity testing in the form of slug tests, step drawdown, and constant rate pumping tests were performed in April and June, 2012, to further characterize hydrogeologic conditions within the Site. Results pertaining to the hydrogeologic investigation are provided in Section 2.9.

A tidal survey was conducted in March 2006 as part of the OU-1 Site Characterization in order to evaluate the effects that tidal fluctuations in the Hudson River have on the groundwater elevations and flow direction at the Site (Parsons, 2006). Groundwater levels were observed over a 3-day period in three OU-2 monitoring wells and three OU-1 monitoring wells. The data, when

compared to tidal fluctuations in the Hudson River, show that Site monitoring wells are not influenced by tides. The tidal survey data is summarized in Table 3.

2.3 TEST PIT EXCAVATION RESULTS

Thirteen (13) test pits (twelve during SC activities, one during PDI activities) were excavated to assess the presence of MGP structure remnants and the presence of non-aqueous phase liquid (NAPL) at the Site. Test pit locations are depicted on Figure 3. Descriptions and observations for each test pit are presented on test pit logs provided as Appendix C. Photographs obtained during the test pit investigation are also provided with the test pit logs. The subsurface soils observed in the test pits generally consisted of fill materials including silt, sand, gravel, and large cobbles and debris. During the SC test pit investigation activities, the brick walls of the former gasholders at the Site were revealed. In addition, a few of the suspected former tar tanks/skimmer pumps were encountered. The test pit excavated during PDI field activities (TP-PDI9) was intended to locate the former large gas holder wall on the eastern portion of the Site. During excavation, what appeared be the wall of a tar pump foundation was revealed at 2.5 feet bgs. Rapid water intrusion was encountered at 3 feet bgs. Excavation depth was therefore limited, and the holder wall was never encountered.

Due to the presence of shallow water in most of the test pits and the presence of impacted materials at the bottom of several of the test pits, only two investigation soil samples were collected (TP-11 and TP-14) during the test pit excavations in accordance with the SC Work Plan. The soil analytical results are presented in Table 4. Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) detected during the SC are presented on Figures 10 and 11. No sample was collected from the test pit excavated during PDI activities.

No VOCs were detected above 6 NYCRR 375 Unrestricted use Soil Cleanup Objective (USCO) in the test pit soil samples.

Three (3) polyaromatic hydrocarbons (PAHs) were detected above their individual Unrestricted Use Cleanup Objective (USCO) in a soil sample collected from TP-11. Total SVOC concentrations in soil samples collected from test pits ranged from 0.96 ppm (TP-14) to 57 ppm (TP-11). Mercury was detected above its USCO value in the soil sample collected from test pit TP-11. Cyanide was not detected in either of the test pit soil samples.

In addition to the two test pit soil samples described above, four (4) waste characterization samples were collected from impacted zones observed in test pits TP-2, TP-5, TP-6 and TP-8 and analyzed for Resource Conservation and Recovery Act (RCRA) waste characteristics, total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs). One of the samples collected from beneath a NAPL seam in test pit TP-2 (~10 feet bgs) exhibited a Toxicity Characteristics Leaching Procedure (TCLP) benzene concentration of 1,100 micrograms per liter (µg/L) which exceeds the regulatory limit of 500 µg/L for a hazardous waste. The remaining three (3) waste characterization samples did not exhibit the characteristics of a hazardous waste.

2.4 SOIL BORING RESULTS

During SC activities, a total of thirty-seven (37) soil samples (including duplicates) were collected from soil borings and analyzed for VOCs, SVOCs, metals, cyanide and TCLP lead.

Analytical results were compared with Recommended Soil Cleanup Objectives provided in NYSDEC TAGM 4046 (NYSDEC, 1994) for initial interpretation. In this AAR, analytical results are compared with USCOs and Commercial Soil Cleanup Objectives (CSCOs) provided by NYSDEC in 6 NYCRR Part 375 (NYSDEC, 2006).

During PDI activities, a total of fifty-four (54) soil samples (including duplicates) were collected from the soil borings and monitoring well locations, and analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, and cyanide. Analytical results were compared with USCOs and CSCOs.

Soil samples collected from soil borings during both SC and PDI activities were submitted to Chemtech Laboratories for analysis. Descriptions and observations for soil borings are presented on soil boring logs and are provided in Appendix D. Two additional grab soil samples (TAR DRIP and PUR-1) were collected during the SC field activities and analyzed for VOCs, SVOCs, metals, cyanide and TCLP lead. TAR DRIP was a sample of black-stained soil collected during the repair of the damaged gas line on the southeastern corner of the Site. PUR-1 was a soil sample collected at the eastern property boundary where the ground elevation is approximately 4 feet below the grade of the adjacent paved area.

PID Readings

Photoionization detector (PID) readings for soil samples collected during SC soil boring and monitoring well installation activities ranged from 0.0 to 9,999 ppm. PID readings above 1,000 ppm (0.1%) were detected at the following SC boring locations and intervals:

- SB-5 (7-12 feet bgs; 15-16 feet bgs)
- SB-10 (33-34 feet bgs)
- SB-20 (34-35 feet bgs)
- SB-21 (20-21 feet bgs)
- SB-22 (16-17 feet bgs)
- MW-3 (23-24 feet bgs)

The maximum PID reading (9,999 ppm) was detected at SB-10 (33-34 feet bgs).

PID readings for soil samples collected during PDI soil boring and monitoring well installation activities ranged from 0.0 to 9,999 ppm above background. PID readings above 1,000 ppm (0.1%) were detected at the following PDI boring locations and intervals:

- PDI-2 (5-30 feet bgs)
- PDI-3 (7-9 feet bgs)
- PDI-5 (35-40 feet bgs)
- PDI-7 (13-19, 25-27, 29-31, 33-35, and 37-41.5 feet bgs)
- PDI-15 (10-12 feet bgs)
- PDI-17 (37-37.5 feet bgs)
- PDI-21 (20-40 feet bgs)
- PDI-22 (20-25 and 30-35 feet bgs)
- PDI-23 (15-20 feet bgs)
- PDI-24 (17-19 and 21-25 feet bgs)

- PDI-29 (24-27 and 29-31 feet bgs)
- MW-24 (5-7 feet bgs)
- PW-1 (5-10 feet bgs)

The maximum PID readings (9,999 ppm) were detected at PDI-2 (5-20 feet bgs), PDI-7 (41-41.5 feet bgs), and PDI-21 (25-30 feet bgs).

Soil Grab Samples

Two grab samples, TAR DRIP and PUR-1 were collected during SC activities. Four (4) VOCs were detected in TAR DRIP, three (3) of which (ethylbenzene, m,p-xylene, and o-xylene) were found in exceedance of USCOs. No VOCs were found in exceedance of CSCOs. No VOCs were detected in PUR-1. Two PAHs were detected in TAR DRIP, neither of which were found in exceedance of USCOs. Thirteen SVOCs, all of which were PAHs, were detected in PUR-1. Ten (10) PAHs [acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluorene, ideno(1,2,3-c,d)pyrene, and pyrene] were found in exceedance of USCOs. Of these, five (5) PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene] were found in exceedance of their respective CSCOs.

VOCs

A total of seven (7) individual VOCs were detected in the soil boring samples collected during SC activities. Methylene chloride and acetone were detected; however, these compounds are a common laboratory contaminant and were each detected at low concentration in only one sample. Carbon disulfide, styrene, and methylene chloride did not exceed their respective USCOs in any of the soil samples. At least one (1) benzene, toluene, ethylbenzene, and xylene (BTEX) compound was detected above individual USCOs in 22 soil samples and individual CSCOs in three (3) soil samples. Total VOC concentrations ranged from non-detect to 11,830 ppm, with maximum concentrations being detected in soil collected from SB-20, at a depth of 34 to 35 feet bgs. In general, the BTEX concentrations exceeded USCOs and CSCOs in the soil samples where visual NAPL was observed in the subsurface along the perimeters of the former gasholders and in the vicinity of the former tar tank/skimmer pump structures.

A total of twenty-one (21) individual VOCs were detected as least once in soil samples collected during PDI activities. Nine (9) VOCs (acetone, benzene, ethylbenzene, n-propylbenzene, toluene, 1,2,3-trimethylbenzene, 1,3,5-trimethylbenzene, m,p-xylene, and o-xylene) were detected at concentrations exceeding their respective USCOs. Of these, five (5) VOCs (benzene, ethylbenzene, toluene, 1,2,4-trimethylbenzene, and M-p-xylene) were detected at concentrations exceeding their respective CSCOs. Exceedance of CSCOs were found in three (3) samples (PDI-3 (7-9 ft), PDI-17 (37-37.5 ft), and PDI 24 (23-25 ft). Total VOC concentrations ranged from 0.0034 ppm to 3,375 ppm, with the maximum concentrations being detected in soil collected from PDI-3, at a depth of 7 to 9 feet bgs. VOC analytical results exceeding CSCOs for the soil samples collected during SC and PDI activities are presented in Table 4 and on Figure 10.

SVOCs

A total of 23 SVOCs were detected at least once in soil boring samples collected during SC activities. Fourteen (14) PAHs [acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)pyrlene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene] were detected at concentrations exceeding their respective USCOs in at least one soil sample. Of these, eight (8) PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene] were detected at concentrations exceeding their respective CSCOs in at least one soil sample. One (1) SVOC, dibenzofuran, was detected at a concentration exceeding its USCO in one soil sample [MW-6 (11-13 ft. bgs)]. No SVOCs were found in exceedance of CSCOs. Total SVOC concentrations ranged from non-detect to 3,530 ppm, with the maximum concentration being detected in soil collected from SB-22, at a depth of 16 to 18 ft. bgs. In general, PAH concentrations were found in exceedance of CSCOs in locations were NAPL was observed in the subsurface, primarily along the perimeters of the former gasholders and in the vicinity of the former tar tank/skimmer pump structures. A total of 23 SVOCs were detected at least once in soil boring samples collected during PDI activities. Eleven (11) PAHs (acenapthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(a)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, and phenanthrene) were detected at concentrations exceeding their respective USCOs in at least one soil sample. Of these, six (6) PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene, and naphthalene] were detected at concentrations exceeding their respective CSCOs in at least one soil sample. Total SVOC concentrations ranged from non-detect to 2,198 ppm, with the maximum concentration being detected in soil collected from PDI-24, at a depth of 23 to 25 ft. bgs. Consistent with prior observations, PAH concentrations found in exceedance of CSCOs are generally observed near the estimated locations of former gasholder walls. SVOC analytical results exceeding CSCOs for soil samples collected during the SC and PDI activities are presented on Table 4 and Figure 11.

Inorganics

A total of twenty-three (23) metals were detected in the soil samples collected during SC activities. Of these, ten (10) metals (arsenic, barium, cadmium, copper, lead, mercury, nickel, selenium, silver and zinc) were detected above their respective USCOs. Four (4) metals (arsenic, barium, copper or lead) exceeded their respective CSCOs in three (3) soil samples. Cyanide was detected above USCOs and CSCOs in two soil samples (PUR-1 [40 ppm] and SB-20 [93 ppm]). TCLP lead exceeded the regulatory level of 5,000 µg/L for toxicity characteristic hazardous waste in two soil samples, SB-8 (25-27') and SB-10 (33-35'). Metal analytical and TCLP lead results from SC activities are presented on Table 5.

A total of 54 soil samples collected during PDI activities were submitted for cyanide analysis. Cyanide was detected in 41 of the 54 soil samples analyzed. Cyanide concentrations were not detected in exceedance of its USCO.

2.5 GROUNDWATER SAMPLE RESULTS

Three (3) groundwater sampling events have been conducted at the Site. Groundwater samples collected during each event were analyzed for TCL VOCs, TCL SVOCs, Target Analyte List (TAL) metals, and cyanide. Laboratory analytical results for constituents detected in groundwater samples are summarized in Table 6 and on Figure 12. Groundwater sampling logs are presented in Appendix E. For evaluation purposes, analytical results were compared with Class GA groundwater quality standards and guidance values contained in NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 (NYSDEC, 1998). These standards and guidance values are protective of groundwater assuming groundwater is used as a drinking water source. That assumption is not applicable to OU-2, as the present and intended Site use is industrial, therefore groundwater is not now used and will likely not be used in the future as a source of drinking water.

The first sampling event was conducted in May 2003 as part of SC activities and consisted of collecting groundwater samples from five of the six monitoring wells (MW-1, MW-2, MW-3, MW-4, and MW-5) in place at the time. The 2007 sampling event was conducted in May 2007 and groundwater samples were collected from two of the existing monitoring wells (MW-2 and MW-5). The third sampling event was conducted in June 2012 as part of PDI activities, and consisted of collecting groundwater samples from six monitoring wells (MW-2, MW-5, MW-19, MW-21, MW-22, MW-23). Monitoring well MW-19 was installed in 2007 as part of the OU-1 Remedial Investigation, and monitoring wells MW-21, MW-22 and MW-23 were installed during OU-2 PDI activities.

During groundwater sampling activities, each monitoring well was monitored for the presence of NAPL. As per the SC and PDI work plans, groundwater was not sampled in the event NAPL was observed. During SC activities, NAPL was observed in monitoring well MW-6. This area had been disturbed during the construction of the pedestrian bridge, and this disturbance was likely the reason for the shallow NAPL observations. During the 2007 sampling event, no NAPL was observed in either monitoring well sampled. During PDI activities, NAPL was observed in monitoring wells MW-1, MW-3, MW-4, MW-6, and MW-24.

VOCs

Seven (7) VOCs were detected at least once in groundwater samples during SC activities. Groundwater from each of the five wells sampled exceeded Ground Water Quality Standards (GWQS) guidance values for BTEX. Styrene was detected in exceedance of GWQS guidance values in four wells (MW-1, MW-3, MW-4 and MW-5). Methyl tert-butyl ether (MTBE) was detected in samples from MW-1 and MW-5 at concentrations of 4.9 and 1.3 µg/L, respectively. MTBE is typically associated with gasoline and is not an MGP-related compound. Total VOC concentrations ranged from non-detected to 161,200 µg/L, with maximum concentrations occurring adjacent to the large gasholder, co-located with subsurface NAPL observations, and minimum concentrations occurring in the most downgradient well.

Twelve (12) VOCs were detected in MW-5 groundwater samples during the 2007 sampling event. No VOCs were detected in MW-2. In MW-5, groundwater exceeded GWQS guidance

values for BTEX (benzene, toluene, ethylbenzene, m/p-xylene, and o-xylene), and isopropylbenzene.

Eighteen (18) VOCs were detected at least once in groundwater samples collected during PDI activities. Of these, ten (10) VOCs (isopropylbenzene, n-propylbenzene, styrene, 1,2,4 trimethylbenzene, 1,3,5 trimethylbenzene, benzene, ethyl benzene, toluene, m/p-xylene, and o-xylene) were detected at concentrations exceeding their respective GWQS guidance values. Isopropylbenzene, 1,2,4 trimethylbenzene, ethyl benzene, toluene, o-xylene, and total xylenes were detected above their respective GWQS guidance values in six (6) monitoring wells (MW-2, MW-5, MW-19, MW-21, MW-22, and MW-23). N-propylbenzene, 1,3,5 trimethylbenzene, styrene, toluene, and m/p-xylene were detected above their respective GWQS guidance values in five (5) monitoring wells (MW-5, MW-19, MW-21, MW-22, and MW-23). Similar to SC activity groundwater observations, maximum concentrations occur adjacent to the large gasholder, co-located with subsurface NAPL observations, while the lowest concentrations are observed at the most downgradient well (MW-2).

SVOCs

Fourteen (14) SVOCs were detected at least once in groundwater samples collected during SC activities. Four (4) PAHs [acenapthene (MW-2, MW-3, MW-4, and MW-5), fluorene (MW-3), naphthalene (MW-1, MW-3, MW-4, and MW-5), phenanthrene (MW-3 and MW-4)] were detected at concentrations exceeding their respective GWQS guidance values in each monitoring well sampled. Two non-PAH SVOCs [2-methylphenol (MW-1 and MW-3), 3+4-methylphenols (MW-3 and MW-4)] were detected at concentrations exceeding their respective GWQS guidance values in three (3) samples. Total PAH concentrations ranged from 47.6 µg/L in MW-2 to 3216 µg/L in MW-4. Total SVOC concentrations ranged from 47.6 µg/L in MW-2 to 3244 µg/L in MW-4. Maximum concentrations occur adjacent to the large gasholder (at MW-4), while the lowest concentrations occur at the most downgradient well (MW-2).

Nine (9) SVOCs were detected at least once in groundwater samples collected during the 2007 groundwater sampling event. Two (2) PAHs (acenapthene in MW-2, and naphthalene in MW-5) were detected above their respective GWQS guidance values. No non-PAH compounds were detected in exceedance of GWQS guidance values. Total PAH concentrations ranged from 36 µg/L in MW-2 to 554.9 µg/L in MW-5. Total SVOC concentrations ranged from 45.8 µg/L in MW-2 to 561.4 µg/L in MW-5.

Sixteen (16) SVOCs were detected at least once in groundwater samples collected during PDI activities. Four (4) PAHs [acenapthene (MW-5, MW-19, MW-21, and MW-22), fluorene (MW-19), naphthalene (MW-2, MW-5, MW-19, MW-21, MW-22, MW-23), and phenanthrene (MW-19)] were detected in exceedance of their respective GWQS guidance values. Two (2) non-PAHs (2-methylphenol and 3+4-methylphenols) were detected above their respective GWQS guidance values in MW-19 and MW-21. Generally consistent with previous investigations, more impacted groundwater may be found adjacent to the large gasholder, co-located with subsurface NAPL observations, while minimally impacted groundwater may be found at the most downgradient well.

Cyanide

During SC activities, cyanide was detected at a concentration of 569 µg/L in MW-1, exceeding the GWQS guidance value. No cyanide was detected in groundwater collected during the 2007 sampling event. Cyanide was detected at each of the six (6) monitoring wells sampled during PDI activities and exceeded the GWQS guidance values in MW-21 (788 µg/L) and MW-23 (234 µg/L).

Inorganics

Eighteen (18) metals were detected in groundwater samples collected during SC activities. Five (5) metals (antimony, iron, manganese, sodium, and thallium) were detected in concentrations exceeding GWQS guidance values. Antimony, iron, and sodium were found in exceedance in each of the five wells sampled. Manganese was found in exceedance at monitoring well MW-2, and thallium was found in exceedance at monitoring well MW-4.

Fourteen (14) metals were detected in groundwater collected during 2007 sampling. Three (3) metals (iron, manganese, and sodium) were detected in concentrations exceeding GWQS guidance values. Iron, manganese, and sodium (as well as their dissolved forms) were found in exceedance at MW-2, while iron and sodium were found in exceedance at MW-5.

Six (6) metals were detected in groundwater samples collected during PDI activities. No metals were found in exceedance of GWQS guidance values, and MW-5 was the only monitoring well in which any detections were observed.

Waste Characterization

During PDI activities, ten (10) soil samples were selected for waste characterization analysis to evaluate potential disposal options, if required, during remedial construction activities. The waste characterization activities consisted of TCLP VOCs, TCLP SVOCs, TCLP Metals, TCLP Pesticides/Herbicides, TPH, ignitability, reactivity, corrosivity, reactive cyanide, total sulfur, and polychlorinated biphenyls (PCBs). Grab samples were collected based on visual observations, PID readings, and anticipated maximum remedial excavation depths (i.e., 15 feet bgs for excavation). Waste characterization samples were collected from the following locations and intervals: PDI-1 (23-25 ft), PDI-3 (7-9 ft), PDI-9 (5-15 ft), PDI-11 (5-10 ft), PDI-13 (10-15 ft), PDI-18 (11-13 ft), PDI-22 (15-20 ft), PDI-23 (10-20 ft), PDI-27 (10-15 ft), and PDI-30 (18-20 ft).

The results for soil sample waste characterization analyses are provided in Table 7 and Table 8. Of the ten (10) samples, one (1) sample exhibited a TCLP benzene concentration of 1.2 ppm, which exceeds the regulatory limit of 0.5 ppm for a hazardous waste. Although none of the samples had a pH greater than 12.5 (i.e., exhibits the characteristic of corrosivity), the majority of samples did have a pH greater than 10, with the maximum being 11.5.

2.6 NAPL OBSERVATIONS AND SAMPLING RESULTS

During SC and PDI activities, soil samples were visually characterized for the presence of potential impacts (NAPL, sheen, odor, staining). During SC activities, NAPL was observed in eight (8) test pit locations and fourteen (14) soil/ monitoring well locations throughout the Site. NAPL was observed at these locations in non-continuous intervals at depths ranging from 1 to 35 feet bgs.

During PDI activities, NAPL was observed in test pit location TP-PDI9 and 30 soil boring/monitoring well locations throughout the Site. In some instances, NAPL was not observed within extracted soil samples, but in wash-water from specific intervals. Similar to SC observations, NAPL was observed at depths ranging from 3.5 to 41 feet bgs. In general, NAPL was observed along the perimeter of the gasholders in the vicinity of the former tar tanks/skimmer pumps. NAPL detected within the former gasholders was limited to the outside edge of the structures. NAPL was not observed at locations near the center of the large gasholder. NAPL was detected during SC activities at or near the bedrock surface in the southern portion of the Site at soil borings SB-18, SB-20 and SB-21. NAPL was detected during PDI activities at or near the bedrock surface in the southern portion of the Site at soil borings PDI-31, PDI-21, PDI-20, PDI-17, PDI-16, PDI-15, and CONT-4. Visual NAPL observations are summarized on Figure 13.

On May 13, 2003, approximately 3.6 feet of Dense Nonaqueous Phase Liquid (DNAPL) was encountered at the bottom of monitoring well MW-6 during groundwater sampling activities. NAPL was not observed in any of the remaining wells on May 13, 2003. On October 16, 2003, small amounts of DNAPL (between 0.03 and 0.20 feet) were encountered in monitoring wells MW-4, MW-5 and MW-6. NAPL was observed in monitoring wells MW-4 and MW-6 at the Site prior to implementation of the tidal study in 2006. Upon notification, the NYSDEC requested that the NAPL be removed from these monitoring wells. NAPL was removed from monitoring wells MW-4 and MW-6 on March 21, 2006.

Two representative samples of NAPL were collected from SC soil boring locations and submitted to META Environmental for forensic hydrocarbon fingerprint analysis by modified method 8100. One NAPL-saturated soil sample was collected from soil boring SB-23 (9 to 11 feet bgs) and one DNAPL sample was collected from the bottom of monitoring well MW-6 during groundwater sampling activities. In general, the results indicate that the samples contained probable residue from a former MGP using the carbureted water gas process.

During groundwater gauging and monitoring well development associate with PDI activities, approximately 1 foot and 3 feet of NAPL were encountered at the bottom of monitoring wells MW-4 and MW-6, respectively. NAPL samples were collected from each well and submitted to Chemtech for NAPL physical characteristics analysis. Approximately one liter of highly weathered and viscous NAPL was removed from both MW-4 and MW-6. The results of NAPL analysis are summarized in Table 9.

2.7 SOIL GAS SAMPLING

During SC activities, soil gas samples were collected from three locations along the northern and eastern boundaries of the Site. The sampling locations, SG-1 through SG-3, are presented on Figure 3. Soil gas samples were collected in accordance with the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion (NYSDOH, 2005). Two soil gas samples (1 feet bgs and 4 feet bgs) were collected from each location. All soil gas samples were submitted for laboratory analysis of VOCs using modified EPA Method TO-15. Table 10 includes the soil gas analytical results.

2.8 GEOTECHNICAL RESULTS

In addition to analytical testing performed on soil collected from PDI activities, select soil samples were submitted to GeoTesting Express for geotechnical characterization. These samples were selected to be representative of subsurface materials at the Site both within and in close proximity to areas in which excavation would be considered. The geotechnical laboratory soil testing included:

- Soil classification using the Unified Soil Classification System (USCS) (ASTM D2487);
- Moisture content (ASTM D2216);
- Sieve with/without hydrometer (ASTM D422);
- Atterberg limits (ASTM D4318);
- Specific gravity (ASTM D854);
- Organic content (ASTM D2974); and
- Soil pH (ASTM D4972).

Tables 11 provides a summary of soil classification, moisture content, specific gravity, organic content, and soil pH results. Table 12 provides a summary of grain size and Atterberg limit results. The samples tested were predominantly considered to be silty sand based on the USCS; however, silty gravel and low plasticity clay were also present in some areas. The remainder of the results can be summarized as follows:

- Moisture contents varied from 3.5 to 21.7 percent with average value of 13.8 percent;
- Percent gravel in the samples ranged from 1.6 to 71 percent with an average of 26 percent;
- Percent sand in the samples ranged from 5.8 to 72 percent with an average of 49 percent;
- Percent fines in the samples ranged from 2.2 to 92.6 percent with an average value of 26 percent. Within the fines, the clay content varied from 1 to 22 percent with an average value of 7.3 percent;
- Atterberg limits indicate the materials varied from being non-plastic to low plasticity.
- Specific gravity varied from 2.68 to 2.71 with an average value of 2.69;
- Organic content varied from 0.1 to 0.8 percent with an average value of 0.4 percent; and
- Soil pH varied between about 6 and 9 when both analysis methods were takin into consideration (i.e., in distilled water and in calcium chloride). The locations with soil pH values greater than 8 are consistent with locations where groundwater pH values were greater than 9.

The geotechnical laboratory results presented above provide a range in properties of the soil portion of the fill materials at the Site; however, the presence of debris (i.e., wood, metal, concrete, brick, mortar, etc.) must also be considered when defining the physical properties of the fill materials overlying the bedrock. The SC and PDI boring logs (Appendix D) contain details regarding the debris and bedrock coring. Full geotechnical data is presented in Appendix A as part of the PDI.

2.9 HYDROGEOLOGICAL TEST RESULTS

During PDI activities, artesian conditions were encountered during advancement of CONT-5, CONT-7, PDI-21, PDI-22, MW-24, and PW-1. Temporary artesian conditions were encountered upon completion of monitoring well MW-23 construction, however, this condition subsided approximately 72 hours after installation. Artesian conditions were encountered subsequent to completion of PDI-18/MW-23. Additionally, artesian conditions were encountered during the hand clearing of CONT-6 at approximately 2.5 feet bgs. A series of slug tests, step drawdown, and constant rate pumping tests were therefore performed in order to further characterize hydrogeologic conditions on the Site (Parsons, 2012).

The bedrock located within Manhattan has been subject to multiple deformation events throughout history that applied significant temperature and pressure to the formations metamorphosizing the bedrock into the current gneisses and schists. The result is an intensely folded, faulted, and fractured bedrock composed of metamorphic rocks. Fractured bedrock is noted by the presence of joint systems, or gaps in the rock, at least five of which are documented within the vicinity of the Site (Merguerian, 2008). Both joint systems and foliation planes, formed by the separation and alignment of minerals within a rock during metamorphosis, serve as the primary groundwater migration pathways as the unfractured rock material itself is relatively impermeable. Joints (cracks in the bedrock) are generally formed in regional grid patterns by the pressures and along local planes of weakness, such as foliation planes. Joint systems and foliation planes are often found intersected with each other, and therefore may result in a complicated bedrock hydrogeologic environment. One such system, likely displaying some combination of joints and foliation planes, appears to be present at the Site oriented to the northwest which parallels the regional metamorphic grain (similar to wood grain) and orientations of known faults and joints in the Midtown-Central Park area of Manhattan (Snee, 2009) (Figure 14). At locations PDI-21, PDI-22, PW-1, MW-24, CONT-5, and CONT-7, artesian conditions were encountered only after drilling into bedrock, prior to coring. These locations roughly line up in a northwest-southeast orientation, suggesting that upon bedrock penetration, foliations planes transmitting groundwater were breached during the rock excavation for construction of the gas holder wall foundations thereby producing artesian conditions.

The aquifer testing data obtained during the PDI indicate that the aquifer at the Site is heterogeneous and anisotropic in terms of hydraulic properties. Transmissivity values derived from the constant rate pumping test at PW-1 range from 122 to 239 ft^2/day, with PW-1 recovery data yielding a value of 523 ft^2/day. Dividing this range in transmissivity values by saturated thicknesses ranging from 10 to 30 ft yields average hydraulic conductivity of 3 to 20 ft/day. The slug test and step drawdown test performed in well MW-22, and the slug test performed in MW-23, indicate that the hydraulic conductivity in the immediate vicinities of these wells is substantially higher than PW-1, perhaps by one or two orders of magnitude. Conversely, the slug test results for some other wells indicate lower conductivities in some areas, which could be associated with the presence of NAPL.

The unconfined specific yield of the saturated fill material is estimated to range from approximately 0.02 to 0.31 based on pumping tests results, with NAPL-impacted portions expected to have lower specific yields than unimpacted areas. The wide range of storage term values derived

from the constant rate pumping tests may be due to the presence or absence of NAPL in the pore spaces, the variable nature of the fill material in the large gas holder, the presence of locally confined or semiconfined conditions within a primary unconfined water bearing zone, and/or the relatively short duration of the constant rate pumping test.

The hydraulic tests were mostly limited to the area within the large gas holder; therefore, the hydraulic characteristics of the shallow water-bearing zone outside the large has holder are less well understood. A detailed Aquifer Test Summary is provided in Appendix A as part of the PDI.

SECTION 3.0

EXPOSURE ASSESSMENT

This section presents a qualitative exposure assessment for the Site, in accordance with Appendix 3B of NYSDEC DER-10, and based on the results of the investigation activities that have occurred at the Site to date. The information collected during the SC, supplemental SC, and PDI has been used to qualitatively assess potential exposure pathways for the various detected compounds at the Site. The exposure assessment is graphically illustrated on Figure 15 and briefly discussed here.

The Site is located in a highly-urbanized area, which is zoned for manufacturing uses. The Site is currently developed as a parking lot that includes a pedestrian bridge over Route 9A to the Intrepid Sea, Air and Space Museum. Currently, the Site is covered with concrete and asphalt pavement, and there is no surface soil exposed on the Site.

Under the current scenario, a potential exposure to impacted materials at the Site is unlikely unless intrusive subsurface work is performed (e.g., repair of underground utilities) or should the Site be developed. The field investigations have revealed that surface soils consist of fill material and are covered with concrete or asphalt pavement. Therefore, current exposure to soils at the Site is very limited. In addition, no free-phase product or DNAPL was observed in the surface soil. Proper engineering controls can be implemented during intrusive activities to minimize the exposure at the OU-2 site.

Groundwater throughout the Site is impacted primarily with BTEX, PAHs, and NAPL. Potential exposure to impacted groundwater may occur if future construction activities are conducted at the Site. Groundwater at the Site is currently not used and there are no plans for future use of potable or commercial/industrial groundwater at the Site. Site groundwater appears to flow towards the Hudson River. Based on the results of ground water samples collected from OU-1, the groundwater results did not exceed the Class GA standards in a monitoring well located upgradient of the Hudson River.

SECTION 4.0

REMEDIAL GOALS, REMEDIAL ACTION OBJECTIVES, AND SCGS

4.1 REMEDIAL GOAL

The primary remedial goal for the areas of the Site affected by MGP-related impacts is to ensure that the MGP-related contamination does not present a threat to human health or the environment considering the manner in which the properties are used, and to develop and implement the necessary remedial actions to remediate the area to a level that is protective of human health and the environment for such uses.

4.2 REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are medium-specific objectives which achieve protection of human health and the environment. RAOs were established based on contaminated media, identified contaminants of concern, standards, criteria, and guidance values (SCGs), and results of the exposure assessment. SCGs are promulgated requirements and non-promulgated guidance which guide site activities during investigation and remediation. The standards and criteria are set forth in Federal or New York State law and they are either directly applicable or relevant and appropriate to a contaminant, remedial action, location, or other circumstance. Guidance includes non-promulgated criteria which should be considered, for investigation and/or remediation. The following generic RAOs are identified on the NYSDEC website and are to be used for various media, where applicable:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

4.3 APPLICABLE STANDARDS, CRITERIA AND GUIDANCE VALUES

Title 6 of New York Codes, Rules and Regulations (6 NYCRR) Part 375-6 Remedial Program Soil Cleanup Objectives (SCOs), effective December 14, 2006, has been used in preparing this AAR. Remedial actions conducted in New York State are required to attain SCGs to the extent practicable as per DER-10 (NYSDEC, 2010). The remedy evaluation portion of the AAR must consider applicable SCGs.

The NYSDEC *DER-10* includes a complete list of SCGs. The SCGs for soil and groundwater include the 6 NYCRR Part 375-6 SCOs for unrestricted use and commercial use and the NYSDEC *Division of Water Technical and Operational Guidance Series -Water Quality Standards* (*WQS*) - *6 NYCRR 700 to 706* (NYSDEC, 1998) for the Site. The above SCGs represent available criteria and guidance used by the NYSDEC to evaluate soil and groundwater quality. It should be noted, however, that neither the 375-6 SCOs or WQS are directly applicable to the Site groundwater because the local groundwater is not used as a drinking water source, nor will it likely be used in the future due to New York City laws. The 6 NYCRR Part 375-6 SCOs and WQS are provided as SCGs for comparison purposes only as far as the local groundwater standards or criteria are concerned.

SECTION 5.0

DEVELOPMENT AND EVALUATION OF REMEDIAL ALTERNATIVES

This section describes the remedial action alternatives evaluated for the Site in this AAR and evaluates each alternative against criterion included in DER-10.

5.1 PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES

As part of the remedial action selection process for the Site, a preliminary screening was performed to reduce the number of remedial technologies potentially applicable with respect to technical implementability. Technical implementability was determined by using the known Site conditions and investigation results to screen out technologies that cannot effectively be implemented at the Site.

The results of the preliminary screening for remedial technologies to address MGP-related impacts at the Site are presented on Table 13. Based on the preliminary screening, the types of remedial technologies listed below were identified as applicable technologies to retain for further evaluation.

- Excavation and off-site disposal and treatment of soils that exceed CSCOs;
- *In situ* stabilization and solidification (ISS) of NAPL-impacted soils; and
- Institutional controls and engineering controls.

The development of alternatives using retained remedial technologies took into consideration the limitations posed by Site conditions and the practical use of equipment. Based on Site investigations, MGP-impacted material is present at depths up to 40 feet bgs. When considering excavation and off-site disposal, the space limitations of the Site prohibits the practical implementation of an alternative that removes MGP-impacted materials at depths greater than 15 feet bgs. Excavation below 15 feet bgs would require significant shoring systems likely interfering with neighboring properties and utilities, as well as demanding significant space for dewatering and water treatment facilities.

Due to limitations of practical excavation depth, the implementability of ISS below the reasonable reach of excavation equipment was analyzed. One form of ISS technology utilizes large diameter augers in a process that creates vertical columns of stabilized soils. Stabilized columns reduce the hydraulic conductivity of Site soils, and therefore reduce the potential for off-site migration of MGP-impacted materials. Throughout Site investigation activities, numerous subsurface obstructions were encountered at varying depths in the form of debris, concrete, bricks, and bedrock boulders. The encountered obstructions often required aggressive drilling techniques in order to advance borings. The presence of numerous subsurface obstructions below typical excavator removal depths indicates that deep soil mixing using augers is likely to be impractical. The obstructions would impede the advancement of large diameter augers, resulting is numerous zones of poor or non-existing mixing as noted in Table 13. Deep auger mixing is not retained for further consideration.

A common ISS technique where debris is present uses excavators for blending the reagents into the materials. The excavator can move, remove, or break debris. However, this technique has practical depth limitations of 15 to 20 feet. Excavator-based ISS is retained as an alternative for depths to about 15 feet below the ground surface, which could be the existing ground surface or an excavation surface.

Jet grouting creates columns similar to deep auger mixing, but uses high pressure fluid jets to carve the surrounding materials and blend in the reagent instead of cutting through the material with steel blades. This allows for the advancement of the relatively small diameter jet grouting drill rod through debris and obstructions. The rod is then rotated in this small annulus and the jet carves a much larger annulus. Typical columns can be expected to be 4 to 6 foot in diameter. Boulders, debris, and other obstructions can prevent the jet from reaching the full diameter, so relatively close spacing may be required. However, once below an obstruction, the jet can carve a full diameter column in appropriate materials. Jet grouting is often used for solidification below utilities for this reason. Jet grouting ISS is retained as an alternative for depths as deep as the bedrock surface.

As per DER-10 subsection 4.4(d).3, a minimum of one alternative is required for a site that is part of the VCP and the remedial party can propose additional alternatives. Considering the future anticipated use of the Site, Con Edison is evaluating the following three remedial alternatives for the Site to achieve the RAOs discussed in Section 4.2:

- Alternatives 1 and 1A – Excavation and off-site disposal and treatment of soils that exceed CSCOs and/or NAPL-impacted soils to a depth of 15 feet and ISS for deeper NAPL-impacted soils.
- Alternatives 2 and 2A –ISS of soils that exceed CSCOs and/or NAPL-impacted soils to 15 feet and ISS of deeper NAPL-impacted soils.
- Alternative 3 – Implementation of Site Management Plan

The three remedial alternatives are further discussed in detail in Sections 5.3, 5.4, and 5.5.

5.2 EVALUATION CRITERIA

In accordance with 6 NYCRR 375-1.8(f) and in conjunction with the additional guidance provided in DER-10 subsection 4.2 (b) through (j), each of the remedial alternatives identified above are evaluated in this section with respect to the following nine evaluation criteria:

1. Overall protection of public health and the environment
2. Compliance with remedial goals, RAOs, and applicable SCGs
3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility or volume
5. Short-term impacts and effectiveness
6. Implementability
7. Cost-effectiveness

8. Land Use
9. Community Acceptance

5.2.1 Overall Protection of Public Health and the Environment

This threshold criterion is an assessment of whether the remedial alternative meets requirements that are protective of human health and the environment. Overall protection of human health and the environment considers how the remedial alternative prevents or mitigates potential risks. The overall assessment is based on a composite of factors assessed under other evaluation criteria, particularly long-term effectiveness and permanence, short-term effectiveness, and compliance with SCGs.

As discussed previously in this AAR, current conditions at the Site do not appear to pose a significant risk to human health or the environment. This criterion focuses on how a specific alternative achieves protection over time and how Site risks are reduced. The analysis includes how the source of contamination is to be eliminated, reduced, or controlled through removal, treatment, containment, engineering or institutional controls.

5.2.2 Compliance with Remedial Goals, RAOs, and Applicable SCGs

As per 6 NYCRR Part 375 and DER-10 subsection 4.2(c), this second threshold criterion conforms to officially promulgated standards and criteria that are either directly applicable, or that are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with.

Such good cause is defined in both 6 NYCRR Part 375 and DER-10, and DER-10 subsection 4.2(c) specifically states that good cause exists if any of the following are present:

- The proposed action is only part of a complete program or project that will, as a whole, conform to such standard or criterion upon completion;
- Conformity to such standard or criterion will result in greater risk to the public health and the environment than alternatives;
- Conformity to such standard or criterion is technically impracticable from an engineering or scientific perspective; or
- The program or project will attain a level of performance that is equivalent to that required by the standard or criterion through the use of another method or approach.

5.2.3 Long-Term Effectiveness and Permanence

This criterion addresses the performance of a remedial alternative in terms of its permanence and the quantity/nature of waste or residuals remaining at the Site after implementation. An evaluation is made on the extent and effectiveness of controls required to manage residuals remaining at the Site and engineering and institutional controls necessary for the remedy to remain effective. The factors that are evaluated include permanence of the remedial alternative, magnitude of the remaining risk, adequacy of controls used to manage residual contamination, and the reliability of controls used to manage residual contamination.

5.2.4 Reduction of Toxicity, Mobility or Volume

This criterion assesses the remedial alternative's use of technologies that permanently and significantly reduce toxicity, mobility, or volume (TMV) of the contamination as their principal element to the extent possible. Preference is given to remedies that permanently or significantly reduce the TMV of the contamination at the Site.

5.2.5 Short-Term Impacts and Effectiveness

This criterion assesses the effects of the remedial alternative during the construction and implementation phase with respect to the effect on human health and the environment. The factors that are assessed include protection of the workers and the community at the Site and adjacent properties during the implementation of the remedial action, environmental impacts that result from the remedial action, and the time required until the RAOs are achieved.

5.2.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing the remedial alternative and the availability of various services and materials required during implementation of the remedial action for the Site. The evaluation includes the feasibility of construction and operation, the reliability of the technology, the ease of undertaking additional remedial action, monitoring considerations, activities needed to coordinate with regulatory agencies, availability of adequate equipment, services and materials, off-site treatment, impacts to nearby utilities and structures, and storage and disposal services.

5.2.7 Cost-Effectiveness

As stipulated in the NYSDEC's Draft Voluntary Cleanup Program Guide (NYSDEC, 2002), it is not necessary to evaluate cost effectiveness in the AAR.

5.2.8 Land Use

This criterion addresses the current, intended, and reasonably anticipated future land use of the Site. 6 NYCRR 375 subchapter 1.8(f)9 requires that land use criterion is to be considered based on the use of a site. The Site is currently used as a pedestrian bridge for the Intrepid Sea, Air and Space Museum and a parking lot. Use of the Site is not anticipated to change. As per 6 NYCRR 375 subchapter 1.8(g), the use of the Site is to be either unrestricted or restricted. Unrestricted use is without imposed restrictions following remediation to Part 375-6 Remedial Program Soil Cleanup Objectives (SCOs) for unrestricted use (i.e., 6 NYCRR Table 6.8 [a]). Restricted uses include imposed controls and restrictions, such as engineering and institutional controls following remediation to Part 375 SCOs for restricted use such as restricted residential, commercial, or industrial use (i.e., 6 NYCRR Table 6.8 [b]).

The existing zone for the Site based on the New York City Planning Commission Zoning Map 8c (Appendix B) is a manufacturing district.

5.2.9 Community Acceptance

Concerns of the state and the community will be addressed separately in accordance with a Citizen Participation Plan (CPP) and requirements outlined in DER-10's citizen participation section.

5.3 ALTERNATIVES 1 AND 1A – EXCAVATION AND OFF-SITE DISPOSAL AND TREATMENT OF SOILS IN THE UPPER 15 FEET EXCEEDING CSCOs AND/OR NAPL-IMPACTED AND ISS OF DEEPER NAPL-IMPACTED SOILS

This remedial alternative would involve the following major components:

- Removal and off-site disposal/treatment of MGP-impacted soils exceeding CSCOs to 15 feet bgs;
- Installation of a temporary dewatering system and treatment of construction water;
- ISS for deeper soils NAPL-impacted soils; and
- Institutional and engineering controls for remaining Site contamination.

Based on SC and PDI investigations conducted at the Site, the estimated conceptual remediation areas for the MGP-impacted soil (i.e., soil that contains NAPL or exceeds CSCOs) to 15 feet bgs are depicted on Figures 16 and 17. This depth has been selected in accordance with 6 NYCRR Part 375-1.8(g)(6)(iii). Based on Site data collected during SCR and PDI activities, the estimated volume of Site soils to be removed to 15 feet bgs for off-site disposal/treatment is approximately 12,200 cubic yards (in place) under these remedial alternatives.

In order to remove the MGP-impacted soils to 15 feet bgs, excavation shoring/bracing systems would be installed around the estimated remediation areas depicted on Figures 16 and 17. Excavation sidewall sloping or benching may be possible in the interior portions of the Site. The investigations have shown significant quantities of debris and other obstructions that will limit the types of shoring systems likely to be feasible at the Site. These types of conditions often dictate the use of soldier pile and lagging systems which allow for drilling through obstructions to install the soldier piles and then excavating down through the debris to install the lagging as the excavation progresses. The steel soldier piles are usually small in dimension (less than 18-inch thick) steel H-pile sections and can be drilled using large diameter roller bit or small diameter drilled pier auger rigs. This equipment is generally adept at advancing through most obstructions. The shallow bedrock in many areas around the edge will likely require drilling the soldier piles into the bedrock where the depth to bedrock is less than 5 feet below the bottom of the excavation.

The presence of open roadways and buried utilities on the northern, southern, and western borders of the Site are expected to pose a challenge during implementation of this remedy, and will require further evaluation. Shored excavations generally cause ground movements and these movements could be damaging to buried utilities. Due to the proximity of the adjacent building and structures on the east side of the Site, excavation shoring/bracing or sidewall benching/sloping may also pose a significant challenge during the implementation of this remedy and would require

further evaluation. It is not known whether underpinning of the adjacent building/structures is required or feasible. Underpinning would likely require access agreements with property owners.

Since the remedial excavation depths would extend below the Site's water table, a temporary multi-well dewatering system would be required and construction water would require either on-site treatment or off-site disposal for this remedial alternative. Due to the high-water table and the Site's subsurface stratigraphy, it is anticipated that a significant volume of groundwater would need to be removed during the remedial action. The storage tanks and/or groundwater treatment equipment would require a significant area of the Site for staging. It is also expected that some of the sewers and water lines adjacent to the Site could leak water into the excavation area. The expected soldier pile and lagging approach to excavation shoring does not cut off water flow, unlike sheet piling. As a result, groundwater removed from the excavation may also lower the water table under adjacent roadways and structures and the deeper the excavation, the greater the radius of dewatering around the excavation. The potential adverse effects of the dewatering activities on adjacent structures, utilities, and roadways would need to be evaluated. An impermeable barrier wall would be required to preclude off-site flows of groundwater into the excavation. Maintaining its alignment is expected to be challenging on this Site with significant debris and obstructions.

Excavation to depths deeper than 15 feet bgs along the border of the Site poses additional challenges, as the active roadways and possible buried utilities would require additional stabilization. The aging utilities in Manhattan streets can easily be damaged by excavation-induced ground movements. These weakened utilities could fail immediately or at a later date. The investigations have shown that some of these locations along the streets have depths to bedrock in excess of 30 feet which will require extensive shoring and bracing with likely associated ground movements.

Since excavations below 15 feet may not be technically practical, or safe, given the inherent space limitations within the excavation areas, the deeper NAPL-impacted soils will be treated using ISS. Alternative 1 is shown on Figure 16 which shows the expected remediation areas for ISS to a depth of 30 feet bgs. We have assumed that this ISS can be accomplished using excavator-based ISS starting on the 15 foot bgs excavation surface. Alternative 1 is expected to have 10,000 cubic yards (in place) of ISS volume in addition to the 12,200 cubic yards of excavation.

Alternative 1A is shown on Figure 17 and adds additional ISS to below 30 feet bgs to Alternative 1. The additional expected volume is 640 cubic yards (in place). A couple of these deeper locations may require jet-grouting, involving mobilization of an additional piece of equipment, if the excavators are unable to reach these depths.

As discussed previously, ISS technology generally involves the mixing of contaminated soils with binder reagent to create stabilized material that discourages groundwater flow through it thus greatly reducing the potential for contaminants in Site soils from migrating off-site. Table 14 summarizes the instances of physical obstructions such as, debris, concrete, brick, and cobbles that were observed during the investigation program. Many borings and test pits encountered such instances, including conditions that required the use of sonic driller or roller bits to advance borings through boulders, concrete, and other obstructions. The numerous obstructions encountered

indicate that deep soil mixing using augers is likely to be impracticable which prompted the development of this alternative.

The performance criteria for the ISS would be determined during the remedial design based on the results of a treatability test.

Due to the bulking factor associated with ISS (i.e., the volume expansion that occurs during treatment), a portion of the excavated zone would be occupied by the treated materials during the ISS activities. The bulking factor is typically 25-30 percent and would more accurately be estimated during a treatability study.

The remedial design would consider the delineated remediation areas, the depths to bedrock, the geotechnical properties of the subsurface stratigraphy and materials, the presence/absence of subsurface foundations and obstructions and aquifer properties, in order to develop the construction details of this remedy. Excavated areas will be backfilled with certified clean material that meets the requirements of backfill outlined in Appendix 5 of DER-10 or with Site soils not exceeding CSCOs. In order to address the potential for off-site sources to impact the backfill, the potential for leaving portions of the perimeter excavation shoring/bracing system in-place to prevent off-site sources coming in contact with the backfill material would be evaluated during the development of the remedial design.

This alternative would require the implementation of institutional and engineering controls for remaining contamination at the Site. As previously mentioned, the Site is currently covered with concrete or asphalt pavement, and there is no surface soil exposed at the Site. Likewise, it is anticipated the Site will be restored in kind following implementation of any remedial actions. These conditions, combined with the presence of backfill between the ISS formation and existing grade, would minimize groundwater infiltration and potential disturbance of the ISS formation. The institutional controls would require controls on the future intrusive activities that come in contact with Site groundwater or the ISS formation to mitigate exposure to remaining contamination and ensure integrity of the remedy. As per DER-10, a Site Management Plan (SMP) would be prepared to specify the methods necessary to ensure compliance with the institutional and engineering controls for the Site. This would include inspections to verify the Site use has not changed and that the potential for direct contact with the underlying remaining contamination has not been created. Additionally, a long-term monitoring program for groundwater may be required to demonstrate the continued effectiveness of the selected remedy.

5.3.1 Overall Protection of Public Health and the Environment

This remedial alternative would be protective of human health and the environment through the removal of soils exceeding CSCOs and/or containing NAPL to 15 feet bgs, ISS of deeper soils containing NAPL, the placement of backfill meeting CSCOs, and the implementation of institutional and engineering controls (e.g., post-remedial monitoring in the SMP). In addition, the current and proposed conditions at the Site will prevent direct contact with remaining Site soils above CSCOs.

5.3.2 Compliance with Remedial Goals, RAOs, and Applicable SCGs

Implementation of remedial alternatives 1 or 1A would prevent the direct contact/ingestion of MGP-impacted soils exceeding CSCOs and groundwater, the inhalation of volatiles from impacted soil and groundwater, and will remove approximately 12,200 cubic yards and treat an additional 10,000 to 10,640 yards of MGP-impacted soils in the areas depicted on Figures 16 and 17. Compliance with groundwater SCGs, achieving groundwater RAOs or soil RAOs related to groundwater contamination would not be achieved but would be addressed by a SMP. It is expected that natural attenuation processes (biodegradation, volatilization, adsorption, chemical reactions and dilution) will result in reduced concentrations of MGP-related constituents in groundwater over time.

5.3.3 Long-Term Effectiveness and Permanence

Remedial excavation of MGP-impacted soils that exceed CSCOs and backfilling with certified clean material that meets the requirements in Appendix 5 of DER-10 or with Site soils not exceeding CSCOs would be effective in the long term. However, there is a potential for dissolved phase constituents in groundwater to migrate into the clean fills from unremediated materials. The environment and conditions to which the solidified material is exposed can affect the stability of the treated material. However, since the ISS formation would be below grade and overlain by concrete and asphalt pavement, infiltration and disturbance would be minimized. Therefore, the degradation of the ISS formation and its stability is anticipated to be minimal and relatively slow. The relatively low permeability of the solidified material would also limit migration of dissolved phase constituents from unremediated areas outside the solidified mass.

A SMP would be implemented to provide for the continued protectiveness of this remedial alternative.

5.3.4 Reduction of Toxicity, Mobility or Volume

Under this alternative, approximately 12,200 cubic yards of MGP-impacted soil exceeding CSCOs and/or NAPL-impacts would be removed and approximately 10,000 to 10,640 cubic yards of MGP-impacted soil exceeding CSCOs and/or NAPL-impacts would be treated in the areas depicted on Figures 16 and 17. Removal of soils is estimated to reduce the volume of MGP-related constituents in the subsurface by about 53 percent. In addition, excavated material would be replaced with soils not exceeding CSCOs or certified clean material that meets the requirements in Appendix 5 of DER-10, which would reduce adverse impacts to groundwater. ISS of the deeper materials would reduce the mobility of constituents in impacted soil through the solidification of these constituents. ISS down to 30 feet bgs in Alternative 1 will increase the mitigation of MGP-impacted soil exceeding CSCOs and/or NAPL-impacts to 97 percent. ISS of materials below the depth of 30 feet bgs in Alternative 1A is expected to address the final 3 percent of MGP-impacted soil exceeding CSCOs and/or NAPL-impacts. By minimizing the mobility of constituents of interest in soil, ISS would limit the potential future migration of constituents from soil to groundwater. The bedrock topography within the Site serves as a natural barrier to off-site migration, as a bedrock trough forms a ring around the former gasholder. In addition, since ISS would extend to soils below the water table, saturated soils that might otherwise result in

groundwater quality impacts would be contained (and/or completely bound) within the solidified matrix

5.3.5 Short-Term Impacts and Effectiveness

The short-term risks of exposure and safety concerns associated with this remedial alternative include dust and odors during the implementation of the remedial action and construction-related health and safety issues. Given the proximity of active city streets to the Site, an open excavation could potentially result in damage to neighboring utilities. Additionally, an open excavation could potentially result in damage to the buildings present on the western side of the Site. Noise and truck traffic in this highly-congested area may also be a disturbance to surrounding community during remedial construction. It is estimated that between 4,000 and 6,000 truckloads of material would be transported to and from the Site under this remedial alternative, including excavated material and backfill. Other short term impacts and effectiveness associated with potential geotechnical issues and adverse impacts to adjacent structures would be evaluated during the remedial design.

It is expected that approximately twelve to fifteen months would be required to implement this remedial alternative. The parking lot would not be available, and it is likely that access to the pedestrian walkway would be interrupted during remedial activities.

A health and safety plan (HASP) would be prepared by the selected remedial contractor to address health and safety issues, and a community air monitoring plan (CAMP) would be implemented during intrusive remedial activities. Odor and dust control measures would be implemented by the selected remedial contractor during the remedial action in accordance with New York State Department of Health (NYSDOH) guidelines.

5.3.6 Implementability

The implementability of this remedial alternative would have significant challenges associated with the depths of the remedial excavations, the need for robust excavation shoring/bracing systems, the significant dewatering volume that would be required, the proximity of adjacent buildings, structures, roadways and utilities, the volume of material to be managed, the space constraints of the Site and the extended project schedule. As such, the implementation of this remedial alternative in close proximity to the adjacent buildings, structures, roadways, and utilities may have restrictions.

The excavation shoring system may need to extend down to and possibly into the bedrock (e.g., soldier piles). A shoring system would likely require a tie back anchor system and would add to the complexity of the excavation shoring system. Other shoring systems, such as secant pile shoring systems are typically significantly more difficult and expensive to construct than soldier pile and lagging shoring systems, especially in debris filled soils. Moreover, the installation of the excavation shoring/bracing system may generate excessive vibrations that could potentially have adverse impacts to adjacent buildings and structures and tie back anchors would need to extend off-site, particularly under the adjacent roadways and associated utilities. Internally braced excavation shoring/bracing systems would also be evaluated during the remedial design.

Supplemental excavation shoring/bracing systems (e.g., trench boxes) may be required if excavations deeper than 15 feet bgs are needed and the initially installed shoring/bracing systems cannot facilitate these deeper excavations. Excavations deeper than 15 feet bgs would have significant challenges given the inherent space limitations within the excavation areas and would likely require additional layers of tiebacks or bracing as well as increasing the likelihood of significant ground movements outside the excavation, especially in the adjacent roadways. This would be further evaluated during the development of the remedial design and/or implementation of the remedial construction.

The significant dewatering required under this remedial alternative would require extensive on-site treatment or containerization for off-site disposal. This would be challenging given the limited space on the Site and may have adverse impacts to the stability of adjacent buildings and structures. As such, the implementation of this remedial alternative in close proximity to the adjacent buildings and structures may have restrictions.

This alternative would require numerous trucks travelling to and from the Site during the implementation of the remedial action. Though located in a commercial area, space constraints do exist at the Site and would contribute to the challenge associated with material management. The proper traffic routes and truck staging areas would need to be selected to minimize adverse impacts to local communities and traffic patterns.

The ISS technology has been implemented on several former MGP sites located in New York State, including the New York City area. The challenges associated with the implementability of ISS techniques include subsurface obstructions, large subsurface voids, and dense/stiff soils. As discussed above, significant subsurface obstructions were encountered during SC and PDI activities across the Site but can be generally addressed through the use of jet grouting equipment with drill hole spacing modified based on the quantity of debris and obstructions encountered so that the obstructions are less likely to interfere with good mixing. Therefore, good mixing of the materials and reagents is expected to be consistent and acceptable.

Odor and dust control measures would be implemented during the implementation of the remedial construction activities in accordance with a CAMP. Such measures could include the use of foam and bio-oxidant compounds on odorous materials and a site perimeter misting system.

A detailed engineering evaluation would be conducted during the remedial design to develop the construction details of this remedial alternative. The engineering evaluation would consider the delineated remediation areas, the depths to bedrock, the geotechnical properties of the subsurface stratigraphy and materials, the presence/absence of subsurface foundations and obstructions, impacts to nearby utilities and structures and aquifer properties.

5.3.7 Land Use

The Site is currently developed as a parking lot that includes a pedestrian bridge over Route 9A (West Side Highway) to the Intrepid Sea, Air and Space Museum. Currently, the Site is covered with asphalt and pavement and is used for parking. No future development plans are in consideration of the Site, and groundwater is not utilized as a drinking source. This alternative is

consistent with the anticipated future Site use. However, implementation of this alternative would require interruption of the current Site use for an extended period of time.

5.4 ALTERNATIVES 2 AND 2A – ISS OF SOILS EXCEEDING CSCOS AND/OR NAPL-IMPACTED

This remedial alternative would involve the following major components:

- ISS for soils that exceed CSCOs and/or NAPL-impacted soils; and
- Institutional and engineering controls for remaining Site contamination.

Based on SC and PDI investigations conducted at the Site, the estimated conceptual remediation areas for the MGP-impacted soil (i.e., soil that contains NAPL or exceeds CSCOs) are depicted on Figures 18 and 19. This remedy is expected to use jet grouting ISS techniques to remediate the same footprint considered for excavation and off-site disposal in Alternatives 1 and 1A. Based on Site data collected during SCR and PDI activities, the estimated volume of Site soils to be remediated is approximately 22,200 to 22,840 cubic yards (in place) under these remedial alternatives.

As discussed previously, ISS technology generally involves the mixing of contaminated soils with binder reagent to create stabilized material that discourages groundwater flow through it thus greatly reducing the potential for contaminants in Site soils from migrating off-site. Table 14 summarizes the instances of physical obstructions such as, debris, concrete, brick, and cobbles that were observed during the investigation program. Many borings and test pits encountered such instances, including conditions that required the use of sonic drill rig or roller bits to advance borings through boulders, concrete, and other obstructions. The numerous obstructions encountered indicate that deep soil mixing using augers is likely to be impracticable which would prompt the use of jet grouting.

The performance criteria for the ISS would be determined during the remedial design based on the results of a treatability test.

Due to the bulking factor associated with ISS (i.e., the volume expansion that occurs during treatment), shallow soils would require removal to maintain the current grade elevation of the treated area during the ISS activities. The bulking factor is typically 25-30 percent and would more accurately be estimated during a treatability study. As such, shallow soils within the remediation areas would be excavated to a shallow depth to just above the water table, but not more than 5 feet bgs based on the following:

- To make room for the management of the excess material that is generated during ISS techniques;
- To remove shallow NAPL-impacted soils to facilitate operation of ISS equipment;
- To provide temporary containment during the ISS mixing operations;
- To remove known former piping/tanks/pumps left in place; and
- To ensure that the ISS formation is below frost depths.

The depths to which the shallow soils are removed to facilitate implementation of this remedial alternative would be finalized during the engineering design. Bulking may require removal of some ISS treated materials to maintain them below the frost line.

The remedial design would consider the delineated remediation areas, the depths to bedrock, the geotechnical properties of the subsurface stratigraphy and materials, the presence/absence of subsurface foundations and obstructions and aquifer properties, in order to develop the construction details of this remedy.

This alternative would require the implementation of institutional and engineering controls for remaining contamination at the Site. As previously mentioned, the Site is currently covered with concrete or asphalt pavement, and there is no surface soil exposed at the Site. Likewise, it is anticipated the Site will be restored in kind following implementation of any remedial actions. These conditions, combined with the presence of backfill between the ISS formation and existing grade to address frost considerations, would minimize groundwater infiltration and potential disturbance of the ISS formation. The institutional controls would require controls on the future intrusive activities that come in contact with Site groundwater or the ISS formation to mitigate exposure to remaining contamination and ensure integrity of the remedy. As per DER-10, a SMP would be prepared to specify the methods necessary to ensure compliance with the institutional and engineering controls for the Site. This would include inspections to verify the Site use has not changed and that the potential for direct contact with the underlying remaining contamination has not been created. Additionally, a long-term monitoring program for groundwater may be required to demonstrate the continued effectiveness of the selected remedy.

5.4.1 Overall Protection of Public Health and the Environment

This remedial alternative would be protective of human health and the environment through the immobilization of NAPL-impacted soil using ISS techniques, the placement of backfill meeting CSCOs, and the implementation of institutional controls (e.g., post-remedial monitoring in the SMP). The ISS would render NAPL in the soil immobile. In addition, conditions at the Site will prevent direct contact with remaining Site soils.

5.4.2 Compliance with Remedial Goals, RAOs, and Applicable SCGs

This remedial alternative would prevent the direct contact/ingestion of NAPL-impacted soil and groundwater, the inhalation of volatiles from impacted soil and groundwater, and would treat/remove approximately 22,200 to 22,840 cubic yards of Site soils in the areas depicted on Figures 18 and 19. This alternative does not actively remove all of the NAPL-impacted soils. However, the ISS process would render the MGP related constituents in soil immobile. Compliance with groundwater SCGs would not be achieved but would be addressed by a SMP. It is expected that natural attenuation processes (biodegradation, volatilization, adsorption, chemical reactions and dilution) will result in reduced concentrations of MGP-related constituents in groundwater.

5.4.3 Long-Term Effectiveness and Permanence

The environment and conditions to which the solidified material is exposed can affect the stability of the treated material. However, since the ISS formation would be below grade and

overlain by concrete and asphalt pavement, infiltration and disturbance would be minimized. Therefore, the degradation of the ISS formation and its stability is anticipated to be minimal and relatively slow. The relatively low permeability of the solidified material would also limit migration of dissolved phase constituents from unremediated areas outside the solidified mass. Moreover, a SMP would be implemented to ensure the continued protectiveness of this remedial alternative.

5.4.4 Reduction of Toxicity, Mobility or Volume

Under this remedial alternative, approximately 22,200 to 22,840 cubic yards of Site soils would be treated/removed in the areas depicted on Figures 18 and 19. ISS would reduce the mobility of constituents in impacted soil through the solidification of these constituents. ISS of the upper 30 feet of soils will mitigate about 97 percent of MGP-impacted soil exceeding CSCOs and/or NAPL-impacts in Alternative 2. ISS of materials below the depth of 30 feet BGS in Alternative 2A is expected to address the final 3 percent of MGP-impacted soil exceeding CSCOs and/or NAPL-impacts. By minimizing the mobility of constituents of interest in soil, ISS would limit the potential future migration of constituents from soil to groundwater. The bedrock topography within the Site serves as a natural barrier to off-site migration, as a bedrock trough forms a ring around the former gasholder. In addition, since ISS would extend to soils below the water table, saturated soils that might otherwise result in groundwater quality impacts would be contained (and/or completely bound) within the solidified matrix.

5.4.5 Short-Term Impacts and Effectiveness

The short-term risks of exposure and safety concerns associated with this remedial alternative include dust and odors during the ISS activities and construction-related health and safety issues. Noise and increased truck traffic may also be a disturbance to surrounding community during remedial construction. It is estimated that between 1,500 and 2,000 truckloads of material (including excavated materials, backfill and reagent deliveries) would be transported to and from the Site under this alternative. Other short term impacts and effectiveness associated with potential geotechnical issues and adverse impacts to adjacent structures would be evaluated during the remedial design.

It is expected that approximately six to nine months would be required to implement this remedial alternative. The parking lot would not be available, and it is likely that access to the pedestrian walkway would be interrupted during remedial activities.

During implementation of this remedial alternative, a HASP would be prepared by the selected remedial contractor to protect on-site workers and a CAMP would be implemented in accordance with NYSDOH guidelines.

5.4.6 Implementability

The ISS technology has been implemented on several former MGP sites located in New York State, including the New York City area. The challenges associated with the implementability of ISS techniques include subsurface obstructions, large subsurface voids, and dense/stiff soils. As discussed above, significant subsurface obstructions were encountered during SC and PDI activities across the Site but can be generally addressed through the use of jet grouting. Therefore,

good mixing of the materials and reagents is expected to be consistent and acceptable. Implementation of this alternative would not require shoring of the surrounding roadways and structures and should require little dewatering which reduces the potential impacts to adjacent utilities and roadways.

Odor and dust control measures would be implemented during the implementation of the remedial construction activities in accordance with a CAMP. Such measures could include the use of foam and bio-oxidant compounds on odorous materials and a site perimeter misting system.

A detailed engineering evaluation would be conducted during the remedial design to develop the construction details of this remedial alternative. The engineering evaluation would consider the delineated remediation areas, the depths to bedrock, the geotechnical properties of the subsurface stratigraphy and materials, the presence/absence of subsurface foundations and obstructions, impacts to nearby utilities and structures and aquifer properties.

5.4.7 Land Use

The Site is currently developed as a parking lot that includes a pedestrian bridge over Route 9A (West Side Highway) to the Intrepid Sea, Air and Space Museum. Currently, the Site is covered with asphalt and pavement and is used for a parking lot. No future development plans are in consideration of the Site, and groundwater is not utilized as a drinking source. This alternative is consistent with the anticipated future Site use. However, implementation of this alternative would require interruption of the current Site use for a period of time.

5.5 ALTERNATIVE 3 – LONG-TERM SITE MANAGEMENT

This proposed remedial alternative would consist of the following elements:

- Development and Implementation of a Site Management Plan
- Establishment of an Annual Groundwater Monitoring Program
- Establishment of Institutional Controls in the form of Deed Restrictions
- Annual Site Inspections and Periodic Review Reporting

The SMP would include an Excavation Work Plan that would be implemented during future intrusive activities that will encounter MGP-impacted materials. The plan would include procedures to control site worker exposure to MGP-impacted materials, community air monitoring, and proper soil handling/disposal procedures.

An annual groundwater monitoring program would also be included as part of this alternative. It would utilize the existing monitoring well network at the OU-1 and OU-2 sites, as appropriate, to confirm groundwater impacts are not migrating off-site to the Hudson River.

Establishment of institutional controls in the form of a deed restrictions on the property within the former MGP site boundary as shown on Figure 18; specifically Manhattan Tax Map Block 1093, Lot 9. The deed restriction would note the presence of possible contaminants and require the owner to allow compliance with conditions of the SMP. Institutional controls on the property would also include a prohibition of groundwater usage, and allow use of the properties for commercial and industrial purposes as defined by local zoning laws.

Annual inspections of the Site to document the Site usage and any change in Site features (e.g., paving). Changes to Site use and/or Site features may require re-evaluation of remedial alternatives and/or the extent of areas requiring SMPs and deed restrictions.

5.5.1 Overall Protection of Human Health and the Environment

This alternative would be protective of human health and the environment. Since OU-2 is currently covered by concrete and asphalt pavement, the potential for exposure to MGP-impacted materials is minimal. In addition, the groundwater on-site and in the vicinity of the Site is not used as a potable water source. Finally, groundwater sampling indicates that impacts are not migrating off-site to the Hudson River. This remedial alternative consists of the development and implementation of a long-term monitoring program and institutional controls to avoid the creation of a completed exposure pathway, even during non-routine activities.

By developing institutional and engineering controls for subsurface soils and groundwater, the risk of human exposure to MGP-impacted materials can be significantly limited within OU-2.

5.5.2 Compliance with Remedial Goals, RAOs, and Applicable SCGs

This remedial alternative will control the direct contact and ingestion of soil and groundwater impacted with MGP related materials by implementation of a SMP. Future exposure to MGP-impacted materials would be under controlled conditions reducing potential risks to workers and the community.

5.5.3 Long-Term Effectiveness and Permanence

This remedial alternative will ensure the continued upkeep of the cover system currently in place at OU-2. Though MGP-impacted materials remain on the Site, no near term development is anticipated. Considering the underlying impacted materials are not anticipated to be disturbed, a combination of subsurface exposure control, maintenance of Site cover, Site monitoring and reporting as required by deed restrictions will serve as long-term protection.

5.5.4 Reduction in Toxicity, Mobility, or Volume

The toxicity, mobility, and volume of MGP-impacted materials within Site soils would not be reduced under this alternative since no removal or treatment would be conducted. However, some amount of natural attenuation is anticipated as dissolved phase constituents break down biologically over time. Additionally, as seen in Site investigation data, the bedrock topography within the Site generally serves as a natural barrier to off-site migration, as a bedrock trough forms a ring around the former gasholder.

5.5.5 Short-Term Impacts and Effectiveness

No short-term impacts would be created as a result of this alternative. No further investigation or removal activities would take place within OU-2 as part of this alternative. No exposure pathways would therefore be established, as the current Site cover serves as protection to human health and environment.

5.5.6 Implementability

The implementability of this alternative would not pose a significant challenge, as a permanent cover system already exists at the Site. The associated SMP, developed to define procedures associated with the monitoring program, engineering controls, and institutional controls, would be readily implementable. Additionally, establishment of required deed restrictions is implementable.

5.5.7 Land Use

The Site is currently developed as a parking lot that includes a pedestrian bridge over Route 9A (12th Avenue – West Side Highway) to the Intrepid Air Seas, and Space Museum. Currently, the Site is covered with asphalt and pavement. No future development plans are in consideration of the Site, and groundwater is not utilized as a drinking source. This alternative would allow for continued use in its current capacity without interruption.

SECTION 6.0

COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

Three alternatives were developed and evaluated in Section 5 to assess the relative merits of each for addressing NAPL or MGP-related impacts at the Site. A relative comparison of the alternatives for each of the evaluation criteria is presented below. The purpose of the analyses was to identify the advantages and disadvantages of each alternative relative to the other so that key comparisons can be made.

6.1 OVERALL PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT

Alternatives 1 and 2 share similarities in that the goal is to either remove or immobilize MGP-impacted soils in order to achieve protection of human health and the environment. For each of these, it is assumed that some MGP-impacted materials would remain on the Site. Alternative 3 utilizes the cover system currently in place at the Site, and exposure controls, in order to achieve protection of human health and the environment without disruptive intrusive activities.

All three alternatives share the development and use of a SMP, since in each case MGP-impacted soils and groundwater remain on the Site. Through the SMP, a combination of engineering controls, institutional controls, and Site monitoring will be utilized to prevent direct contact with remaining MGP-impacted materials.

All three alternatives provide for the overall protection of public health and the environment.

6.2 COMPLIANCE WITH REMEDIAL GOALS, RAOS, AND APPLICABLE SCGS

All three of the alternatives would achieve the remedial goals, and most of the RAOs. RAOs not directly achieved through the implementation of these alternatives include “restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practical”, and “remove the source of ground or surface water contamination”. These outstanding RAOs would be addressed within the SMP that would be developed and implemented for all three alternatives. Additionally, it is expected that some degree of natural attenuation will result in reduced concentrations of MGP-related constituents in groundwater over time, However, it is unlikely that pre-release conditions would be achieved through these processes alone within a predictable timeframe.

Alternatives 1, 1A, 2, 2A, and 3 would achieve the SCGs to varying degrees. MGP-impacted soils that exceed CSCOs would be removed under Alternatives 1 and 1A to 15 feet and MGP-impacted soils that exceed CSCOs in soils would be treated using the ISS process to render the MGP-related constituents immobile. To facilitate implementation of Alternatives 2 and 2A, shallow soils above the water table will be excavated and removed. Alternative 2 does not actively remove deeper NAPL-impacted soils, but the ISS process renders the MGP-related constituents immobile down to the bedrock surface.

6.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

Each of the alternatives in Section 5 would be considered effective in the long-term through the implementation of the SMP, in order to address remaining contaminations and groundwater at the Site.

6.4 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME

Alternatives 1 and 1A provide reduction in the toxicity, mobility, and volume of MGP sourced materials to 15 feet bgs and immobilizes other MGP-related constituents down to bedrock. Alternatives 2 and 2A do not actively remove NAPL-impacted soil deeper than approximately 4 feet bgs, but the ISS process renders MGP-related constituents immobile. Alternative 3 does not reduce the toxicity or volume of MGP sourced materials, as it does not employ intrusive or treatment activities, though mobility of NAPL is restricted by the bedrock trough that forms a ring around the Site. In addition, based on sampling at OU-1, groundwater impacts are not migrating off-site to the Hudson River.

6.5 SHORT-TERM IMPACTS AND EFFECTIVENESS

Alternatives 1, 1A, 2, and 2A include short-term risks of exposure and safety concerns associated with the implementation of each remedial action due to on-site remedial activities, and the significant off-site truck traffic that will be generated within an already congested area of Manhattan. Short-term risks of exposure and safety concerns associated with dust and odors and traffic are higher for Alternatives 1 and 1A than Alternatives 2 and 2A. Remedial construction duration, associated noise and truck traffic for Alternatives 2 and 2A is less than Alternatives 1 and 1A due to the shorter remedial construction duration and the reduced volume of material to be hauled to and from the Site. Alternatives 2 and 2A can be considered more favorable to sustainability initiatives included with DER-31 (Green Remediation) than Alternatives 1 and 1A. Alternative 3 is the most favorable of the three alternatives regarding the sustainability initiatives included in DER-31 because it generates no greenhouse gas emissions or smog-forming air pollutants from construction equipment and trucking.

The intrusive Alternatives 1, 1A, 2, and 2A will employ a HASP to address health and safety issues, and a CAMP during intrusive remedial activities. Alternative 3 poses no short-term risk of exposure or safety concerns, as the alternative employs the existing cover system, and no intrusive activities would be performed. Alternatives 1 and 2 would all require a shutdown of the parking lot while the remedial actions are implemented, and access to the pedestrian walkway would likely be interrupted. Shutdown of any facilities would necessitate the requirement of finding alternate parking during remediation activities. No shutdown would be required for Alternative 3.

6.6 IMPLEMENTABILITY

It is estimated that Alternatives 1 and 1A would require approximately 12 to 15 months to complete remedial construction in the field, and Alternatives 2 and 2A would require approximately six to nine months to complete in the field. Additional investigations may also be required, such as a treatability study for an ISS reagent mixture, as well as time to develop remedial design documents. Alternative 3 would be developed and implemented in a significantly lesser period of time than any intrusive alternative.

The challenges associated with the implementability of Alternatives 1 and 1A include:

- The need for robust excavation shoring and bracing systems;
- The potentially significant dewatering volume that will be required;
- The potential for lowering the groundwater table under nearby buildings, roadways, and utilities;
- The proximity of adjacent buildings, structures, roadways, and utilities;
- Potential damage to utilities and roadways due to excavation-induced ground movements;
- Installation of tiebacks under roadways or other bracing systems;
- The volume of material to be managed;
- The space constraints of the Site;
- Subsurface obstructions (e.g., large rubble, bedrock boulders) that can potentially impede ISS mixing using excavators;
- Alternative 1A may require mobilization of an additional jet grouting rig to the Site;
- Variability of subsurface soils and materials that will require evaluation in treatability studies; and
- The extended project schedule.

In combination, the above result in an extremely difficult remedy to implement. It is anticipated that through extensive engineering design and controls, the remedy is implementable but it would still present significant risks to surrounding infrastructure.

The challenges associated with Alternative 2 and 2A include:

- Subsurface obstructions (e.g., large rubble, bedrock boulders) that can potentially impede ISS mixing using excavators; and
- Variability of subsurface soils and materials that will require evaluation in treatability studies.

Despite the above challenges, it is anticipated Alternatives 2 and 2A are implementable with a moderate level of difficulty. A treatability study would be necessary to confirm the effectiveness of the mix design. In addition, a detailed engineering evaluation would need to consider the geotechnical properties of the subsurface stratigraphy and materials, the presence/absence of subsurface foundations and obstructions, nearby utilities, nearby structures, and aquifer properties.

There are no significant challenges posed with developing and implementing Alternative 3, as this remedy does not involve intrusive activities, and instead relies upon engineering controls, institutional controls, and monitoring programs.

6.7 LAND USE

At present, the Site is zoned as a manufacturing district, and the only structure present consists of a pedestrian walking bridge over State Route 9A to the museum. The majority of the Site is asphalt and paved concrete, and the perimeter is secured by a chain link fence. No future development is anticipated at the Site. Site groundwater is not currently used as a potable water source, nor is it likely that is will be used in the future.

The implementation of Alternatives 1, 1A, 2, and 2A would pose a challenge to land use, as the Site is used as a parking. Foot and vehicle traffic associated with the museum would need to be altered, including a provision for alternate parking. Both of these alternatives would preclude the use of the Site for parking, and likely access to the pedestrian walkway, for many months. Alternative 3 would require no considerations or adjustments to be made, as no construction activities would be conducted.

SECTION 7.0

NYSDEC SELECTED REMEDY

The draft AAR for the Site was submitted to the NYSDEC for review in August 2017. The draft AAR included an evaluation of three remedial alternatives to address NAPL or MGP-related impacts at the Site as compared to the nine evaluation criteria outlined in DER-10 and in accordance with 6 NYCRR 375-1.8 (f). The three remedial alternatives presented and evaluated in the draft AAR included the following:

- Alternatives 1 and 1A (Excavation and Off-Site Disposal and Treatment of Soils in the Upper 15 feet Exceeding CSCOs and/or NAPL-Impacted and ISS of Deeper NAPL-Impacted Soils), presented in Section 5.3, above;
- Alternatives 2 and 2A (ISS of Soils Exceeding CSCOs and/or NAPL-Impacted) presented in Section 5.4, above; and
- Alternative 3 (Long-Term Site Management), presented in Section 5.5, above.

Following review, the NYSDEC selected Remedial Alternative 2A – ISS of Soils Exceeding CSCOs and/or NAPL-Impacted to a Depth of > 30 feet bgs. The NYSDEC selected remedial alternative consists of the following major components:

- Excavation and disposal of overburden Site soils to a depth of up to 5-feet bgs;
- ISS of soils that exceed CSCOs and/or NAPL-impacted soils to depths greater than 30 feet bgs; and
- Institutional and engineering controls for remaining Site contamination.

Based on SC and PDI investigations conducted at the Site, the estimated conceptual remediation areas for the MGP-impacted soil (i.e., soil that contains NAPL or exceeds CSCOs) are depicted on Figure 19. Based on Site data collected during SCR and PDI activities, the estimated volume of Site soils to be remediated is approximately 22,840 cubic yards (in place) under this remedial alternative when accounting for areas in which ISS will be advanced to depths greater than 30 feet bgs. ISS technology generally involves the physical mixing of contaminated soils with binder reagent to create stabilized material that discourages groundwater flow through it thus greatly reducing the potential for contaminants in Site soils from migrating off-site. Physical obstructions are present within the subsurface at the Site, as detailed in Table 14. The presence of numerous subsurface obstructions will pose a challenge during implementation of this remedial alternative, and will likely prompt the use of jet grouting to achieve remedial goals.

Due to bulking factor associated with implementation of ISS, shallow soils within the remediation areas will be excavated to a shallow depth to just above the water table. The remedial design will consider the delineated remediation areas, the depths to bedrock, the geotechnical properties of the subsurface stratigraphy and materials, the presence/absence of subsurface foundations and obstructions and aquifer properties, in order to develop the construction details of

this remedy. In addition, the performance criteria for the ISS would be determined during the remedial design based on the results of a treatability study. Post-ISS coring procedures detailed in *NYSDEC ISS QA/QC Guidance Document* (NYSDEC, 2016) pertaining to post-ISS quality assurance and quality control (QA/QC) will be adhered to during implementation of this remedy. Following implementation, a monitoring program consisting of groundwater sampling, periodic inspections, and periodic review reports would be utilized to monitor the long-term effectiveness and performance of this remedy.

In summary, comparison of Alternative 2A to the evaluation criteria determined the following:

- This remedial alternative would be protective of human health and the environment through the immobilization of NAPL-impacted soil using ISS techniques, the placement of backfill meeting CSCOs, and the implementation of institutional controls (e.g., post-remedial monitoring in the SMP);
- This remedial alternative will prevent the direct contact/ingestion of NAPL-impacted soil and groundwater, the inhalation of volatiles from impacted soil and groundwater, via the treatment/removal of impact materials, and remaining impacts will be managed through institutional and engineering controls;
- This remedial alternative is expected to be long-term and permanent, as degradation of the ISS formation and its stability is anticipated to be minimal and relatively slow;
- This remedial alternative will treat/remove approximately 22,840 cubic yards of Site soils. Implementation of ISS technology would reduce the mobility of constituents in impacted soil through the solidification of these constituents;
- The short-term risks of exposure and safety concerns associated with this remedial alternative include dust and odors during the ISS activities and construction-related health and safety issues. A full CAMP would be implemented during remedial construction. This remedial alternative would take approximately 6 to 9 months to implement, and would restrict access to infrastructure currently in place at the Site (parking lot);
- This remedial alternative is feasible and implementable, however numerous subsurface obstructions are present at the Site which would preclude the use of auger-based ISS technologies, and the targets depths exceeding 30 feet bgs would preclude the use of bucket-mixing technologies. As such, it is anticipated that jet grouting would be utilized to achieve remedial goals to the extent practicable. A detailed engineering evaluation will be conducted during the remedial design to develop the construction details of this remedial alternative; and
- This alternative is consistent with the anticipated future Site use. However, implementation of this alternative will require interruption of the current Site use for a period of time.

SECTION 8.0

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TABLES

Table 1
Bedrock Depths and Elevations Summary
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Boring	Ground Surface Elevation (ft NAVD88)	Depth to Bedrock (ft bgs)	Bedrock Elevation (ft NAVD88)
PDI-1/MW-22	13.4	37.5*	-24.1
PDI-2	14.2	43	-28.8
PDI-3	14.3	17	-2.7
PDI-4	14	39.5*	-25.5
PDI-5	13.9	47.5	-33.6
PDI-6	14.2	13	1.2
PDI-7	14.2	41.5*	-27.3
PDI-9	14.4	36	-21.6
PDI-10	12.7	32	-19.3
PDI-11	13.2	41	-27.8
PDI-12	13.4	12.5	0.9
PDI-13	12.5	40	-27.5
PDI-15	12.2	11	1.2
PDI-16	11.8	30	-18.2
PDI-17	11.8	39	-27.2
PDI-18/MW-23	11.6	25	-13.4
PDI-19	11.3	33	-21.7
PDI-20	11	23.5	-12.5
PDI-21	11	40*	-29
PDI-22	10.7	30.5*	-19.8
PDI-23	10.5	20*	-9.5
PDI-24/MW-21	10.4	27	-16.6
PDI-25	10.3	25	-14.7
PDI-26	11	22*	-11
PDI-27	11	37	-26
PDI-28	10.9	9	1.9
PDI-29	10.7	35	-24.3
PDI-30	10.8	27	-16.2
PDI-31	10	15	-5
PDI-32	13.6	15	-1.4
PDI-33	12.6	30	-17.4
PDI-34	12	7	5
CONT-1	13.8	30	-16.2
CONT-2	13.3	30	-16.7
CONT-3	12.5	35	-22.5
CONT-4	12.6	8	4.6
CONT-5	11.2	16*	-4.8
CONT-7	11.9	15*	-3.1
CONT-8	12.2	24.5*	-12.3
PW-1	11.2	12.5*	-1.3
PW-2	14.6	45*	-30.4

Table 1
Bedrock Depths and Elevations Summary
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Boring	Ground Surface Elevation (ft NAVD88)	Depth to Bedrock (ft bgs)	Bedrock Elevation (ft NAVD88)
MW-24	11.2	13*	-1.8

Notes:

(1) * = An NX rock core was not collected at this boring location because of drilling issues (e.g., artesian conditions, presence of debris) or proximity to a location where an NX rock core was taken.

(2) Borings were not drilled at PDI-8 and PDI-14 because of field observations during drilling at PDI-7 and PDI-15, respectively. Drilling was not performed at CONT-6 because of issues with water entering the hand clearance.

Table 2
Groundwater Depths and Elevations Summary
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Date	Depth to Water (ft)[1]												
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-19	MW-21	MW-22	MW-23	MW-24	PW-1	PW-2
5/13/2003	5.58	8.12	4.99	3.72	3.61 bgs[7]	4.11	Monitoring well not present.	Monitoring well not present.	Monitoring well not present.	Monitoring well not present.	Monitoring well not present.	Monitoring well not present.	Monitoring well not present.
10/16/2003 am	NA[2]	8.31	5.40	3.86	3.31 bgs[7]	3.95							
10/16/2003 pm		8.37	5.21	3.80	3.33 bgs[7]	4.00							
3/13/2006		--[3]	--[3]	2.42	--[3]	3.62							
3/30/2006		--[3]	--[3]	3.14	--[3]	4.45							
4/27/2006		--[3]	--[3]	2.8	--[3]	3.95							
5/22/2007		8.29	--[3]	2.71	1.84 bgs[7]	4.1	6.22						
4/6/2012		7.32	2.8	1	0.3 bgs[7]	3.34	5.55	1.86	1.45	0.78 bgs[7]			
4/10/2012		7.44	3.55	--[3]	--[3]	--[3]	5.5	0.95	1.52	0.7 bgs[7]			
5/8/2012		--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	~0			
5/9/2012		--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	Artesian[8]			
5/10/2012		--[3]	--[3]	~0.13	Artesian[4]	--[3]	--[3]	~1.5	--[3]	Artesian[8]			
5/11/2012		--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	~0.08 bgs[7]			
5/14/2012		--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	Artesian[8]			
5/15/2012 am		--[3]	--[3]	--[3]	Artesian[4]	--[3]	--[3]	--[3]	--[3]	~0.17 bgs[7]			
5/15/2012 pm		--[3]	--[3]	--[3]		--[3]	--[3]	--[3]	--[3]	~0.04 bgs[7]			
6/4/2012		7.17	2.90	0.45	Artesian[4]	3.15	5.25	1.72	1.3	0.2 bgs[7]			
6/18/2012		7.33	2.99	0.96	0.79 ags[5]	3.44	5.37	1.82	1.37	0.24 bgs[7]			
6/27/2012		7.29	3.26	0.73	0.66 ags[5]	3.47	5.31	1.82	1.39	0.29 bgs[7]	0.42 ags[5]	0.38 ags[5]	4.46
6/28/2012		7.3	3.29	--[3]	--[3]	--[3]	5.33	--[3]	1.51	--[3]	--[3]	--[3]	4.53
6/29/2012		--[3]	--[3]	0.78	0.65 ags[5]	--[3]	--[3]	--[3]	1.47	0.25 bgs[7]	0.36 ags[5]	0.25 ags[5]	--[3]
7/12/2012		7.41	3.12	1.18	NA[6]	3.55	5.32	1.89	1.37	NA[6]	NA[6]	NA[6]	--[3]
7/18/2012		7.44	3.08	1.08	NA[6]	3.54	5.32	1.87	1.35	NA[6]	NA[6]	NA[6]	4.46
Overall Average	5.58	7.65	3.69	1.92	1.29 bgs[7]	3.74	5.46	1.68	1.41	0.28 bgs[8]	0.39 ags[5]	0.32 ags[5]	4.48
2012 Average	NA[2]	7.34	3.12	0.79	0.45 ags[5]	3.42	5.37	1.68	1.41	0.28 bgs[8]	0.39 ags[5]	0.32 ags[5]	4.48
Top of PVC Elevation[9]	12.72	10.70	13.60	10.30	10.6	12.20	14.20	9.70	13.00	11.1	12.9	12.30	14.40
Ground Surface Elevation[9]	13.5	11.10	14.10	10.60	10.8	12.20	14.50	10.40	13.40	11.6	11.2	11.20	14.60
Overall Average Groundwater Elevation[9]	7.14	3.05	9.91	8.38	9.51	8.46	8.74	Same as 2012 Average	Same as 2012 Average	Same as 2012 Average	Same as 2012 Average	Same as 2012 Average	Same as 2012 Average
2012 Average Groundwater Elevation[9]	NA[2]	3.36	10.48	9.51	11.25	8.79	8.83	8.02	11.59	11.32	11.59	11.52	9.92

Notes:

(1) Measured from top of PVC, unless otherwise noted. Depths noted for MW-2 and MW-3 on 5/13/03 have been adjusted to account for conversion of these wells to flush-mounted wells in June 2003.

(2) MW-1 was damaged between May 13, 2003, when it was installed, and October 16, 2003. There is an obstruction present at approximately 3 ft below ground surface. A depth to water of 3.51 ft below ground surface was noted during the 2012 pre-design investigation.

(3) A water level measurement was not taken at this well on the date shown.

(4) At MW-5, the artesian flow rate was estimated visually based on the amount of water exiting the top of casing after the watertight plug was removed. On 5/10/12 and 5/15/12, the flow was approximately 0.25 gpm. On 6/4/12, the flow was less than 0.25 gpm.

(5) "ags" indicates that measurement is the number of feet above ground surface in a temporary riser, as compared to the majority of the other wells where measurements are from the top of PVC (i.e., approximately ground surface because the wells are flush mounted). At PW-1 and MW-24, it is assumed that the points of measurement (top of steel casing) were 1.85 ft and 2.6 ft, respectively, above ground surface.

(6) Measurements are not available because this well was abandoned on July 5, 2012.

(7) "bgs" indicates that measurement is the number of feet below ground surface, as compared to the majority of the other wells where measurements are from the top of PVC (i.e., approximately ground surface because the wells are flush mounted). For MW-5, the pre-2012 water depths were adjusted from the water depth readings that were taken from the top of PVC by adding 0.2 ft (i.e., the distance between the top of well or ground surface and the top of casing).

(8) At MW-23, the artesian flow rate was estimated visually based on the amount of water exiting the top of casing after the watertight plug was removed. On 5/9/12, the flow was approximately 3 gpm. On 5/10/12 and 5/14/12, the flow was approximately 10 gpm.

(9) Elevations are based on the North American Vertical Datum of 1988 (NAVD88). Survey measurements are from the 2012 Pre-Design Investigation, 2011 OU-1 Remedial Investigation, 2006 Data Summary for Additional Site Characterization, and 2003 OU-2 Site Characterization.

Table 3
2006 Tidal Study
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Well ID	Highest Groundwater Elevation (feet AMSL)	Lowest Groundwater Elevation (feet AMSL)	Average Groundwater Elevation (feet AMSL)	Range of Groundwater Elevations (feet)
MW-2	0.57	0.32	0.39	0.25
MW-3	6.88	6.2	6.37	0.68
MW-4	7.48	7.05	7.24	0.43
MW-5	8.59	8.28	8.44	0.31
MW-6	7.37	6.77	7.12	0.6
MW-7	2.21	1.83	1.94	0.38
MW-8	9.33	9.11	9.32	0.22
MW-9	5.41	4.71	4.76	0.7

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	TP-11 (6.5 FEET) R1163-02 6.5 FEET Chemtech R1163 Soil 1/13/2003 4/22/2003	TP-14 (6 FEET) R1163-01 6 FEET Chemtech R1163 Soil 1/13/2003 4/22/2003	MW1-0709 R2145-02 7 - 9 FEET CHEMTECH R2145 Soil 4/10/2003 6/8/2003	MW2-0507 R2209-03 5 - 7 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	MW3-0911 R2004-05 9 - 11 FEET Chemtech R2004-05 Soil 4/2/2003 7/2/2003	MW3-2325 R2029-01 23 - 25 FEET Chemtech R2029 Soil 4/3/2003 5/6/2003	MW4-0911 R2260-03 9 - 11 FEET ChemTech R2260 Soil 4/21/2003 6/10/2003	MW5-1113 R2260-01 11 - 13 FEET ChemTech R2260 Soil 4/21/2003 6/10/2003	MW6-0507 R2209-04 5 - 7 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	MW6-1113 R2209-05 11 - 13 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	SB3-0507 R2004-02 5 - 7 FEET Chemtech R2004 Soil 4/1/2003 7/2/2003	SB-5 12-14 R1334-05 12 - 14 FEET Chemtech R1334 Soil 1/27/2003 4/22/2003	SB-5 16-16.5 R1334-06 16 - 16.5 FEET Chemtech R1334 Soil 1/27/2003 4/22/2003
CAS NO.	COMPOUND			UNITS:												
	VOLATILES															
67-64-1	ACETONE	.05	500	mg/kg	0.0089	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
71-43-2	BENZENE	.06	44	mg/kg	0.0078	0.0022 J	1	0.0014 J	**68**	2.6 J	16	0.2 J	7.8	9.3	ND	0.0016 J	0.0013 J
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-41-4	ETHYLBENZENE	1	390	mg/kg	0.076	ND	12	0.01	300	91	30	27	44	36	ND	ND	ND
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0027 J	ND
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-42-5	STYRENE	--	--	mg/kg	ND	ND	8.7	ND	ND	81	110 JN	ND	ND	ND	ND	ND	ND
108-88-3	TOLUENE	.7	500	mg/kg	ND	ND	21	ND	450	93	110	0.15 J	3.2	1.7	ND	ND	0.0015 J
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	0.12	ND	18	0.0044 J	300	140	120	20	29	27	ND	ND	ND
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	0.06	ND	7.9	0.0068	130	62	43 JN	9.3	22	15	ND	ND	ND
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	0.18	ND	25.9	0.0112	430	202	163	29.3	51	42	ND	ND	ND
	TOTAL VOCs	--	--	mg/kg	0.2727	0.0022	68.6	0.0226	1248	469.6	429	56.65	106	89	ND	0.0043	0.0028

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	TP-11 (6.5 FEET) R1163-02 6.5 FEET Chemtech R1163 Soil 1/13/2003 4/22/2003	TP-14 (6 FEET) R1163-01 6 FEET Chemtech R1163 Soil 1/13/2003 4/22/2003	MW1-0709 R2145-02 7 - 9 FEET CHEMTECH R2145 Soil 4/10/2003 6/8/2003	MW2-0507 R2209-03 5 - 7 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	MW3-0911 R2004-05 9 - 11 FEET Chemtech R2004-05 Soil 4/2/2003 7/2/2003	MW3-2325 R2029-01 23 - 25 FEET Chemtech R2029 Soil 4/3/2003 5/6/2003	MW4-0911 R2260-03 9 - 11 FEET ChemTech R2260 Soil 4/21/2003 6/10/2003	MW5-1113 R2260-01 11 - 13 FEET ChemTech R2260 Soil 4/21/2003 6/10/2003	MW6-0507 R2209-04 5 - 7 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	MW6-1113 R2209-05 11 - 13 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	SB3-0507 R2004-02 5 - 7 FEET Chemtech R2004 Soil 4/1/2003 7/2/2003	SB-5 12-14 R1334-05 12 - 14 FEET Chemtech R1334 Soil 1/27/2003 4/22/2003	SB-5 16-16.5 R1334-06 16 - 16.5 FEET Chemtech R1334 Soil 1/27/2003 4/22/2003
	SEMIVOLATILES																
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND	ND	ND	U	U	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	ND	ND	0.072 J	ND	ND	ND	ND	ND	ND	ND	ND	0.068 J	0.055 J
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	0.93	ND	0.18 J	0.42 J	ND	1.1 J	0.39 J	2 J	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	0.33 J	ND	2.4	ND	0.66	1.8	ND	5.9	1.9	11	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.3	ND	ND	ND
	PAHs																
83-32-9	ACENAPHTHENE	20	500	mg/kg	0.75	0.11 J	2.7	0.19 J	0.57	1.7	5.4	79	14	89	ND	ND	ND
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	3.3 J	0.06 J	17 J	0.065 J	2.9	7.6 J	42	14	13	14	ND	ND	ND
120-12-7	ANTHRACENE	100	500	mg/kg	1.7	ND	9.4	0.078 J	2.7	8.3	13	22	9.3	57	ND	ND	ND
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	1.2	0.066 J	**7.7**	0.078 J	2.2	**8.5**	11	**18**	**6.8**	**28**	ND	ND	ND
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	0.99	ND	**5.7**	ND	1.4	**5.2**	7.9 J	**13**	**5.5**	**24**	ND	ND	ND
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	0.61	0.047 J	2.9	ND	0.8	3.2	7 J	**13**	5.1	**16** JN	ND	ND	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	0.28 J	ND	1.3	ND	0.096 J	0.68	1.6	2.2 J	1 J	4.7	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	0.37 J	ND	1.3	ND	0.64	1.7	4 J	2.3 J	1.6 J	13 JN	ND	ND	ND
218-01-9	CHRYSENE	1	56	mg/kg	1.3	ND	8.2	0.087 J	**2.1**	8.1	10	15	6.9	26	ND	ND	ND
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	0.38 J	ND	0.09 J	0.11 J	0.67 J	**1.1** J	0.48 J	1 J	ND	ND	ND
206-44-0	FLUORANTHENE	100	500	mg/kg	1.6	0.13 J	12	0.12 J	5.7	15	20	55	14	71	ND	ND	ND
86-73-7	FLUORENE	30	500	mg/kg	2.5	0.11 J	19	0.083 J	6.4	15	49	88	39	110	ND	ND	ND
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	0.21 J	ND	2.6	ND	ND	1.8	0.63 J	1.9 J	0.68 J	2.7 J	ND	R	R
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	6.9 J	ND	47	ND	12	8.4	67	110	55	570	ND	ND	ND
91-20-3	NAPHTHALENE	12	500	mg/kg	28	0.096 J	45	0.14 J	10	15	73	140	52	260	ND	0.086 J	0.048 J
85-01-8	PHENANTHRENE	100	500	mg/kg	4.9 J	0.15 J	44	0.2 J	12	52	95	200	79	310	ND	ND	ND
129-00-0	PYRENE	100	500	mg/kg	2.3	0.19 J	4.3	0.17 J	8.1	14	37	70	33	93	ND	ND	ND
	TOTAL PAHs			mg/kg	56.91	0.959	230.48	1.211	67.696	166.29	444.2	844.5	336.36	1689.4	ND	0.086	0.048
	TOTAL SVOCs			mg/kg	57.24	0.959	233.882	1.211	68.536	168.51	445.6	851.5	338.65	1711.7	ND	0.154	0.103
	OTHER																
57-12-5	CYANIDE	27	27	mg/kg	ND	ND	ND	ND	ND	4.54	ND	ND	ND	ND	ND	ND	ND

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	SB6-0507 R2004-03 5 - 7 FEET ChemTech R2004 Soil 4/2/2003 7/2/2003	SB7-0507 R2004-01 5 - 7 FEET ChemTech R2004 Soil 4/1/2003 7/2/2003	SB8-1113 R2279-03 5 - 7 FEET ChemTech R2279 Soil 4/23/2003 6/11/2003	SB8-2527 R2279-06 25 - 27 FEET ChemTech R2279 Soil 4/23/2003 6/11/2003	DUP OF SB8(25-27) SB8-2527DUP R2279-07 25 - 27 FEET ChemTech R2279 Soil 4/23/2003 6/11/2003	SB-09-11-13 R2068-01 11 - 13 FEET Chemtech R2068 Soil 4/4/2003 5/7/2003	SB10-3335 R2176-02 33 - 35 FEET Chemtech R2176 Soil 4/14/2003 6/8/2003	SB11-0507 R2260-05 5 - 7 FEET ChemTech R2260 Soil 4/22/2003 6/10/2003	SB-12(10-12) R1359-01 10 - 12 FEET Chemtech R1359 Soil 1/28/2003 4/22/2003	SB-12(19-19.9) R1359-02 19 - 19.9 FEET Chemtech R1359 Soil 1/28/2003 4/22/2003	SB15-0507 R2230-01 5 - 7 FEET ChemTech R2230 Soil 4/18/2003 6/9/2003	SB17-1012 R2209-02 10 - 12 FEET ChemTech R2209 Soil 4/17/2003 6/9/2003	SB-18 20-22FT R1243-04 20 - 22 FEET Chemtech R1243 Soil 1/16/2003 4/19/2003
CAS NO.	COMPOUND			UNITS:													
	VOLATILES																
67-64-1	ACETONE	.05	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
71-43-2	BENZENE	.06	44	mg/kg	0.0029 J	ND	ND	0.11 J	ND	0.0025 J	9	1.2 J	0.0022 J	ND	0.27 J	ND	0.0084 J
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-41-4	ETHYLBENZENE	1	390	mg/kg	0.0023 J	ND	0.023	0.08	0.1	0.0074 J	1.3	29	ND	ND	0.17 J	0.35	0.14 J
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-42-5	STYRENE	--	--	mg/kg	0.0023 J	ND	0.0042 J	0.021 J	0.024 J	0.0057 J	4.1 JN	ND	ND	ND	ND	0.026 J	
108-88-3	TOLUENE	.7	500	mg/kg	ND	ND	ND	0.016 J	0.016 J	0.0027 J	8.2	8.3	0.002 J	ND	ND	ND	0.039 J
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	ND	ND	0.018	0.1	0.13	0.0054 J	5	25	ND	ND	0.25 J	0.16	0.075 J
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	ND	ND	0.01	0.051	0.059	0.0035 J	2.1 JN	14	ND	ND	ND	0.098	0.078 J
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	ND	ND	0.028	0.151	0.189	0.0089	7.1	39	ND	ND	0.25	0.258	0.153
	TOTAL VOCs	--	--	mg/kg	0.0075	ND	0.0552	0.378	0.329	0.0272	29.7	77.5	0.0042	ND	0.69	0.608	0.3664

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
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	SEMIVOLATILES																	
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	U	ND	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	0.063 J	0.067 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.053 J	ND	ND
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	ND	ND	0.046 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	ND	ND	ND	0.25 J	0.18 J	ND	ND	ND	ND	ND	0.57	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	PAHs																	
83-32-9	ACENAPHTHENE	20	500	mg/kg	ND	ND	ND	0.69	0.51	ND	0.11 J	62	ND	ND	5.5	0.12 J	2.5	
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	0.12 J	0.26 J	ND	3.1 J	2.1	ND	0.18 J	30	ND	ND	0.71	ND	0.64	
120-12-7	ANTHRACENE	100	500	mg/kg	0.32 J	0.091 J	ND	1.5	1	ND	0.058 J	36 J	ND	ND	2.5	0.092 J	1.6	
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	0.34 J	0.39	ND	1.2	0.88	0.043 J	0.069 J	**22**	ND	ND	**1.4**	0.083 J	1.3	
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	0.15 J	0.33 J	ND	0.81	0.57	ND	ND	**18** J	ND	ND	**1.1**	ND	0.98	
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	0.091 J	0.25 J	ND	0.4	0.27 J	ND	ND	**17** J	ND	ND	0.55	ND	0.91	
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	0.052 J	0.083 J	ND	0.22 J	0.15 J	ND	ND	4.6 J	ND	ND	0.35 J	ND	0.2 J	
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	ND	0.12 J	ND	0.5	0.34 J	ND	ND	20 J	ND	ND	0.56	ND	0.28 J	
218-01-9	CHRYSENE	1	56	mg/kg	0.36 J	0.39	ND	1.1	0.75	ND	ND	21	ND	ND	1.2	0.088 J	1.3	
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	ND	ND	ND	ND	ND	1.6 J	ND	ND	ND	ND	0.089 J	
206-44-0	FLUORANTHENE	100	500	mg/kg	0.53	0.71	ND	2.7	1.9	0.1 J	ND	49	ND	ND	2.8	0.12 J	1.6	
86-73-7	FLUORENE	30	500	mg/kg	0.23 J	0.1 J	ND	3.2 J	2.2	0.06 J	0.14 J	81	ND	ND	3	0.16 J	2.9	
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	ND	0.073 J	J	0.24 J	0.17 J	ND	ND	1.3 J	ND	ND	0.32 J	ND	0.096 J	
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	0.55	ND	0.078 J	6.6	4.1 J	0.44	4.1	ND	ND	ND	24	1.3	6.8	
91-20-3	NAPHTHALENE	12	500	mg/kg	0.39 J	ND	0.19 J	14	9.6	2.5	49	160	ND	ND	5.9	2.1	16	
85-01-8	PHENANTHRENE	100	500	mg/kg	1.2	0.53	ND	11	6 J	0.21 J	ND	160	ND	ND	12	0.36 J	6.5	
129-00-0	PYRENE	100	500	mg/kg	ND	1.3	ND	3.4 J	2.6	0.12 J	ND	74	ND	ND	5.2	0.14 J	2.6	
	TOTAL PAHs			mg/kg	4.333	4.627	0.268	50.66	33.14	3.473	53.657	757.5	ND	ND	67.09	4.563	46.295	
	TOTAL SVOCs			mg/kg	4.396	4.694	0.268	50.91	33.366	3.473	53.657	757.5	ND	ND	67.66	4.616	46.295	
	OTHER																	
57-12-5	CYANIDE	27	27	mg/kg	ND	ND	ND	ND	ND	3.35	ND	ND	ND	ND	ND	ND	ND	

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	SB-18 24-26FT R1243-05 24 - 26 FEET Chemtech R1243 Soil 1/16/2003 4/19/2003	SB-19 8-10FT R1285-03 8 - 10 FEET Chemtech R1285 Soil 1/21/2003 4/21/2003	SB-19 32-34FT R1285-04 32 - 34 FEET Chemtech R1285 Soil 1/21/2003 4/21/2003	SB-20 32-34FT R1334-01 32 - 34 FEET Chemtech R1334 Soil 1/23/2003 4/22/2003	SB-20 34-35FT R1334-02 34 - 35 FEET Chemtech R1334 Soil 1/23/2003 4/22/2003	SB-21 6-8 R1334-03 6 - 8 FEET Chemtech R1334 Soil 1/24/2003 4/22/2003	SB-21 20-21.5 R1334-04 20 - 21.5 FEET Chemtech R1334 Soil 1/24/2003 4/22/2003	SB-22 16-18FT R1243-02 16 - 18 FEET Chemtech R1243 Soil 1/15/2003 4/19/2003	SB-22 24-25FT R1243-03 24 - 25 FEET Chemtech R1243 Soil 1/15/2003 4/19/2003	SB-23 9-11FT R1285-01 9 - 11 FEET Chemtech R1285 Soil 1/20/2003 4/21/2003	SB-23 22-24.5FT R1285-02 22 - 24.5 FEET Chemtech R1285 Soil 1/20/2003 4/21/2003	SB24-0507 R2286-02 5 - 7 FEET ChemTech R2286 Soil 4/24/2003 6/13/2003	DUP OF SB24(5-7) SB24-0507DUP R2286-03 5 - 7 FEET ChemTech R2286 Soil 4/24/2003 6/13/2003
CAS NO.	COMPOUND			UNITS:														
	VOLATILES																	
67-64-1	ACETONE	.05	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
71-43-2	BENZENE	.06	44	mg/kg	0.59 J	0.19 J	14	**160**	**1900**	8.8	3.2 J	2.6	4.9	3.9 J	37	0.0034 J	ND	
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015 J	0.0015 J	
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
100-41-4	ETHYLBENZENE	1	390	mg/kg	63	1.3	1.6	79	**430**	36	24	23	17	190	42	0.16 J	0.047 J	
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
100-42-5	STYRENE	--	--	mg/kg	ND	0.2 J	4.8	460	2000	21	21	3.5	50	ND	150	0.035 J	0.082 J	
108-88-3	TOLUENE	.7	500	mg/kg	2.3 J	0.24 J	13	**830**	**3900**	11	12	9.8	37	4.2 J	150	0.016 J	0.0058 J	
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	56	0.88 J	7.4	**630**	**2600**	34	43	22	62	160	140	0.14 J	0.052 J	
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	31	0.51 J	3	**240**	**1000**	16	18	10	28	72	41	0.079 J	0.032 J	
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	87	1.39	10.4	**870**	**3600**	50	61	32	90	232	181	0.219	0.084	
	TOTAL VOCs	--	--	mg/kg	152.89	3.32	43.8	2399	11830	126.8	121.2	70.9	198.9	430.1	560	0.4349	0.2203	

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	SB-18 24-26FT R1243-05 24 - 26 FEET Chemtech R1243 Soil 1/16/2003 4/19/2003	SB-19 8-10FT R1285-03 8 - 10 FEET Chemtech R1285 Soil 1/21/2003 4/21/2003	SB-19 32-34FT R1285-04 32 - 34 FEET Chemtech R1285 Soil 1/21/2003 4/21/2003	SB-20 32-34FT R1334-01 32 - 34 FEET Chemtech R1334 Soil 1/23/2003 4/22/2003	SB-20 34-35FT R1334-02 34 - 35 FEET Chemtech R1334 Soil 1/23/2003 4/22/2003	SB-21 6-8 R1334-03 6 - 8 FEET Chemtech R1334 Soil 1/24/2003 4/22/2003	SB-21 20-21.5 R1334-04 20 - 21.5 FEET Chemtech R1334 Soil 1/24/2003 4/22/2003	SB-22 16-18FT R1243-02 16 - 18 FEET Chemtech R1243 Soil 1/15/2003 4/19/2003	SB-22 24-25FT R1243-03 24 - 25 FEET Chemtech R1243 Soil 1/15/2003 4/19/2003	SB-23 9-11FT R1285-01 9 - 11 FEET Chemtech R1285 Soil 1/20/2003 4/21/2003	SB-23 22-24.5FT R1285-02 22 - 24.5 FEET Chemtech R1285 Soil 1/20/2003 4/21/2003	SB24-0507 R2286-02 5 - 7 FEET ChemTech R2286 Soil 4/24/2003 6/13/2003	DUP OF SB24(5-7) SB24-0507DUP R2286-03 5 - 7 FEET ChemTech R2286 Soil 4/24/2003 6/13/2003
	SEMIVOLATILES																	
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	0.048 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	ND	ND	ND	ND	ND	0.21 J	ND	ND	ND	ND	ND	ND	0.04 J	ND
86-74-8	CARBAZOLE	--	--	mg/kg	ND	0.049 J	ND	ND	ND	ND	ND	ND	0.13 J	ND	0.2 J	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	ND	0.31 J	ND	ND	1.1 J	0.11 J	ND	ND	0.7	1.3	ND	0.038 J	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	PAHs																	
83-32-9	ACENAPHTHENE	20	500	mg/kg	27 J	2.3	ND	ND	1.5 J	0.37 J	ND	7.8	0.93	12	2.1	0.25 J	0.26 J	
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	16 J	ND	ND	ND	4.6 J	1.2	0.046 J	240 J	12	1.2	42	0.14 J	0.16 J	
120-12-7	ANTHRACENE	100	500	mg/kg	22 J	1.2	ND	ND	1.5 J	0.56	ND	27	5.2	6.5	17	0.17 J	0.18 J	
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	15 J	0.75	ND	ND	1.8 J	0.56	ND	**21**	3.1	4.4	**16**	0.12 J	0.15 J	
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	**11** J	0.56	ND	ND	0.97 J	0.37 J	ND	**15** J	**2.3** J	**2.8**	**2.9**	0.092 J	0.1 J	
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	**7.9** J	0.38 J	ND	ND	0.8 J	0.39 J	ND	**10** J	2.5 J	2	**11**	0.057 J	0.055 J	
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	0.83	0.21 J	ND	ND	ND	0.21 J	ND	3.3 J	0.49 J	0.78	1.8	ND	ND	
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	1.5	0.19 J	ND	ND	ND	0.15 J	ND	7.8 J	1.2 J	0.93	5.2	ND	ND	
218-01-9	CHRYSENE	1	56	mg/kg	15 J	0.65	ND	ND	2 J	0.62	ND	21	4.4	3.2	30	0.13 J	0.14 J	
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	0.39 J	ND	ND	ND	ND	ND	ND	1.5 J	0.091 J	0.15 J	**0.83**	ND	ND	
206-44-0	FLUORANTHENE	100	500	mg/kg	19 J	1.4	0.044 J	ND	2 J	0.85	0.063 J	24	5.2	8.7	26	0.3 J	0.33 J	
86-73-7	FLUORENE	30	500	mg/kg	27 J	2.6	ND	ND	3.2 J	0.84	ND	120 J	8.4	16	26	0.38	0.4	
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	0.6	0.13 J	ND	R	R	0.11 J	R	1.4 J	0.21 J	0.63	1.5	ND	ND	
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	98 J	30	0.19 J	0.43	97	14 J	0.75	380 J	19 J	260	42	1.7	1.7	
91-20-3	NAPHTHALENE	12	500	mg/kg	230 J	14	1.8	2.9	**1100**	130	9.9	**2200** J	160 J	140	**1000**	2.3	2.4	
85-01-8	PHENANTHRENE	100	500	mg/kg	62 J	7.8	0.12 J	0.052 J	6.9	2.3	0.11 J	280 J	17	38 J	58	1.2	1.3	
129-00-0	PYRENE	100	500	mg/kg	40 J	2.3	0.066 J	ND	2.8 J	1.2	0.061 J	170 J	9.6	13	19	0.41	0.49	
	TOTAL PAHs			mg/kg	593.22	64.47	2.22	3.382	1225.07	153.73	10.93	3529.8	251.621	510.29	1301.33	7.249	7.665	
	TOTAL SVOCs			mg/kg	593.22	64.829	2.268	3.382	1226.17	154.05	10.93	3529.8	252.451	511.59	1301.53	7.287	7.705	
	OTHER																	
57-12-5	CYANIDE	27	27	mg/kg	ND	ND	ND	2.12	**93**	0.914	ND	ND	ND	ND	ND	ND	ND	

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	TAR DRIP R1359-03 Chemtech R1359 Soil 1/28/2003 4/22/2003	PUR-1 R2279-02 ChemTech R2279 Soil 4/23/2003 6/11/2003	CONT1 CONT1(10-15) D2436-03 10 - 15 FT CTECH D2436 SOIL 4/25/2012 9:30 8/20/2012	CONT1 CONT1(20-25) D2436-04 20 - 25 FT CTECH D2436 SOIL 4/25/2012 10:45 8/20/2012	CONT2 CONT2(12-15) D2680-01 12 - 15 FT CTECH D2680 SOIL 5/4/2012 13:35 8/20/2012	CONT3 CONT3(7.5-10) D2588-03 7.5 - 10 FT CTECH D2588 SOIL 5/2/2012 8:45 8/20/2012	CONT5 CONT5(5-10) D2588-06 5 - 10 FT CTECH D2588 SOIL 5/4/2012 8:20 8/20/2012	CONT7 CONT7(5-10) D2588-01 5 - 10 FT CTECH D2588 SOIL 5/1/2012 9:40 8/20/2012	Dup of CONT7(5-10) CONT7 CONT7A(5-10) D2588-02 5 - 10 FT CTECH D2588 SOIL 5/1/2012 9:40 8/20/2012	CONT8 CONT8(10-15)0-40 D3205-02 10 - 15 FT CTECH D3205 SOIL 6/25/2012 13:20 8/20/2012	MW-24 MW-24(10-13)0-12 D3205-01 10 - 13 FT CTECH D3205 SOIL 6/22/2012 10:35 8/20/2012	PDI- 1 PDI- 1(13-15) D1956-01 13 - 15 FT CTECH D1956 SOIL 3/16/2012 11:28 8/20/2012	PDI- 1 PDI- 1(25-27) D1956-02 25 - 27 FT CTECH D1956 SOIL 3/16/2012 14:00 8/20/2012
CAS NO.	COMPOUND			UNITS:														
	VOLATILES																	
67-64-1	ACETONE	.05	500	mg/kg	ND	ND	ND	0.0061 J	0.044	0.074	0.14	0.043	0.027 J	ND	ND	0.016 J	0.026 J
71-43-2	BENZENE	.06	44	mg/kg	ND	ND	ND	ND	0.062	0.0014 J	0.0063	ND	ND	0.002 J	0.017 J	ND	0.009
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND	ND	ND	0.019	ND	ND	ND	ND	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	ND	ND	ND	ND	ND	ND	0.0053 J	ND	ND	ND	ND	ND	0.011
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	ND	ND	ND	ND	0.0016 J	ND	ND	ND	ND	ND	ND	ND
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-41-4	ETHYLBENZENE	1	390	mg/kg	2.4	ND	0.0027 J	ND	0.12	ND	0.25 J	0.0012 J	ND	ND	0.0017 J	ND	3.2
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	ND	ND	ND	ND	0.0072	ND	0.046	0.0015 J	ND	ND	ND	ND	0.12
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	ND	ND	ND	ND	ND	ND	0.024 J	ND	ND	ND	ND	ND	ND
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	0.01	ND	0.0017 J	ND	ND	ND	ND	ND	0.011
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	ND	ND	0.0047 J	ND	ND	ND	ND	ND	ND	0.0038 J	ND
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	ND		ND	ND	0.025	ND	0.02	ND	ND	ND	ND	ND	0.079
100-42-5	STYRENE	--	--	mg/kg	4.6	ND	ND	ND	0.0074	ND	ND	0.0014 J	ND	ND	0.0027 J	ND	0.2
108-88-3	TOLUENE	.7	500	mg/kg	ND	ND	ND	ND	0.092	ND	0.0021 J	ND	ND	0.0014 J	0.0094	ND	0.12
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	ND	ND	0.0066	0.0021 J	0.13	ND	0.23 J	0.0045 J	0.0019 J	ND	ND	ND	7.5
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	ND	ND	0.0014 J	ND	0.047	ND	0.038	ND	ND	ND	ND	ND	2.1
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	0.76 J	ND	0.0023 J	ND	0.32	ND	0.1	0.0022 J	0.0017 J	ND	0.0038 J	ND	2.4
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	0.41 J	ND	0.0023 J	ND	0.13	ND	0.14	0.0019 J	ND	ND	0.0018 J	ND	1.6
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	1.17	ND	0.0047 J	ND	0.45	ND	0.25	0.0041 J	0.0017 J	ND	0.0056 J	ND	4
	TOTAL VOCs	--	--	mg/kg	8.17	ND	0.0153	0.0082	0.9993	0.077	1.0224	0.0557	0.0306	0.0034	0.0364	0.0198	17.376

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	TAR DRIP R1359-03 Chemtech R1359 Soil 1/28/2003 4/22/2003	PUR-1 R2279-02 ChemTech R2279 Soil 4/23/2003 6/11/2003	CONT1 CONT1(10-15) D2436-03 10 - 15 FT CTECH D2436 SOIL 4/25/2012 9:30 8/20/2012	CONT1 CONT1(20-25) D2436-04 20 - 25 FT CTECH D2436 SOIL 4/25/2012 10:45 8/20/2012	CONT2 CONT2(12-15) D2680-01 12 - 15 FT CTECH D2680 SOIL 5/4/2012 13:35 8/20/2012	CONT3 CONT3(7.5-10) D2588-03 7.5 - 10 FT CTECH D2588 SOIL 5/2/2012 8:45 8/20/2012	CONT5 CONT5(5-10) D2588-06 5 - 10 FT CTECH D2588 SOIL 5/4/2012 8:20 8/20/2012	CONT7 CONT7(5-10) D2588-01 5 - 10 FT CTECH D2588 SOIL 5/1/2012 9:40 8/20/2012	Dup of CONT7(5-10) CONT7 CONT7A(5-10) D2588-02 5 - 10 FT CTECH D2588 SOIL 5/1/2012 9:40 8/20/2012	CONT8 CONT8(10-15)0-40 D3205-02 10 - 15 FT CTECH D3205 SOIL 6/25/2012 13:20 8/20/2012	MW-24 MW-24(10-13)0-12 D3205-01 10 - 13 FT CTECH D3205 SOIL 6/22/2012 10:35 8/20/2012	PDI- 1 PDI- 1(13-15) D1956-01 13 - 15 FT CTECH D1956 SOIL 3/16/2012 11:28 8/20/2012	PDI- 1 PDI- 1(25-27) D1956-02 25 - 27 FT CTECH D1956 SOIL 3/16/2012 14:00 8/20/2012
	SEMIVOLATILES																	
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	ND	ND	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	ND	ND	0.5 J	ND	ND	ND	ND	1.8	2.2	ND	ND	ND	ND	0.19 J
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.17 J	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	ND	ND	ND	ND	ND	ND	0.16 J	ND	ND	ND	ND	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	ND	ND	0.22 J	0.2 J	0.34 J	0.54	0.64	0.77	0.55	0.33 J	0.52	0.32 J	0.36 J	
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	PAHs																	
83-32-9	ACENAPHTHENE	20	500	mg/kg	ND	ND	0.24 J	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	ND	240 J	ND	ND	ND	ND	0.21 J	ND	ND	ND	ND	ND	ND	ND
120-12-7	ANTHRACENE	100	500	mg/kg	ND	60 J	0.86	ND	ND	ND	0.57	0.22 J	ND	ND	ND	ND	ND	ND
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	ND	**110** J	1.2	ND	ND	ND	0.39	0.52	0.23 J	ND	ND	ND	ND	ND
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	**110** J	**1.1**	ND	ND	ND	0.26 J	0.44	0.2 J	ND	ND	ND	ND	ND
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	ND	**340** J	1.1	ND	ND	ND	0.24 J	0.58	0.26 J	ND	ND	ND	ND	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	ND	160 J	0.6	ND	ND	ND	ND	0.25 J	ND	ND	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	ND	**140** J	0.4 J	ND	ND	ND	ND	0.24 J	ND	ND	ND	ND	ND	ND
218-01-9	CHRYSENE	1	56	mg/kg	ND	**160** J	1.2	ND	ND	ND	0.4	0.57	0.27 J	ND	ND	ND	ND	ND
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
206-44-0	FLUORANTHENE	100	500	mg/kg	ND	57 J	2.7	ND	ND	ND	0.92	1.1	0.51	ND	ND	ND	ND	ND
86-73-7	FLUORENE	30	500	mg/kg	ND	67 J	0.34 J	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	ND	69 J	0.53	ND	ND	ND	ND	0.22 J	ND	ND	ND	ND	ND	ND
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	0.07 J	ND	0.26 J	ND	ND	ND	41	ND	ND	ND	ND	ND	ND	ND
91-20-3	NAPHTHALENE	12	500	mg/kg	1.8	ND	0.8	ND	0.41 J	ND	16	ND	ND	ND	ND	ND	ND	ND
85-01-8	PHENANTHRENE	100	500	mg/kg	ND	36 J	2.9	ND	ND	ND	3	0.93	0.4	ND	ND	ND	0.2 J	
129-00-0	PYRENE	100	500	mg/kg	ND	130 J	2.8	ND	ND	ND	1.2	0.89	0.45	ND	ND	ND	ND	ND
	TOTAL PAHs			mg/kg	1.87	1679.0	17.03	ND	0.41	ND	66.69	5.96	2.32	ND	ND	ND	0.2	
	TOTAL SVOCs			mg/kg	1.87	1679	17.75	0.2	0.75	0.54	69.19	8.7	5.07	0.33	0.52	0.32	0.75	
	OTHER																	
57-12-5	CYANIDE	27	27	mg/kg	ND	**40 J**	0.213 J	0.061 J	0.332 J	0.067 J	0.116 J	0.057 J	0.091 J	0.048 J	4.5	0.566	ND	

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI- 3 PDI- 3 (7-9) D2144-02 7 - 9 FT CTECH D2144 SOIL 3/30/2012 12:00 8/20/2012	PDI- 3 PDI- 3(15-17) D2144-03 15 - 17 FT CTECH D2144 SOIL 4/2/2012 8:00 8/20/2012	PDI- 4 PDI- 4(13-15) D2144-08 13 - 15 FT CTECH D2144 SOIL 4/4/2012 12:30 8/20/2012	PDI- 4 PDI- 4(35-36.5) D2144-09 35 - 36.5 FT CTECH D2144 SOIL 4/5/2012 7:45 8/20/2012	PDI- 5 PDI- 5(40-42) D2436-01 40 - 42 FT CTECH D2436 SOIL 4/23/2012 15:40 8/20/2012	PDI- 7 PDI- 7 (5-7) D2144-10 5 - 7 FT CTECH D2144 SOIL 4/4/2012 11:55 8/20/2012	PDI- 7 PDI- 7(41-43) D2144-12 41 - 43 FT CTECH D2144 SOIL 4/5/2012 10:10 8/20/2012	PDI-10 PDI-10(14.5-15) D2680-02 14.5 - 15 FT CTECH D2680 SOIL 5/8/2012 13:50 8/20/2012	PDI-11 PDI-11(10-12) D2144-05 10 - 12 FT CTECH D2144 SOIL 3/30/2012 14:15 8/20/2012	PDI-11 PDI-11(40-41) D2144-04 40 - 41 FT CTECH D2144 SOIL 4/2/2012 11:20 8/20/2012	PDI-12 PDI-12 (5-7) D2144-06 5 - 7 FT CTECH D2144 SOIL 4/3/2012 10:00 8/20/2012	PDI-12 PDI-12(10-12.5) D2144-07 10 - 12.5 FT CTECH D2144 SOIL 4/3/2012 10:35 8/20/2012	PDI-16 PDI-16 (5-7) D2680-03 5 - 7 FT CTECH D2680 SOIL 5/9/2012 11:05 8/20/2012
CAS NO.	COMPOUND			UNITS:												
	VOLATILES															
67-64-1	ACETONE	.05	500	mg/kg	ND	0.019 J	ND	ND	0.0072 J	0.05	ND	R	0.015 J	0.021 J	0.095	ND	R
71-43-2	BENZENE	.06	44	mg/kg	**46**	0.0017 J	ND	30	ND	ND	5	0.0052 J	ND	0.053	0.056	0.14 J	0.02 J
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	0.14 J	ND	ND	ND	ND	R	ND	ND	ND	0.8	R
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	0.67 J	ND	ND	0.22 J	ND	ND	0.11 J	R	ND	0.0048 J	ND	0.25 J	R
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	0.0041 J	ND	0.0041 J
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	R
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	0.0032 J	ND	R
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	R	ND	0.0057 J	ND	ND	R
100-41-4	ETHYLBENZENE	1	390	mg/kg	**770**	ND	ND	53	0.0018 J	0.033	11	0.017 J	ND	1.6	0.027	1.2	0.0047 J
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	22	ND	ND	1.7	ND	0.004 J	0.32 J	0.0033 J	ND	0.0093	ND	0.3 J	R
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	0.0079	ND	R
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	ND	ND	ND	ND	ND	0.0095 J	ND	R	ND	ND	0.03	ND	R
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	0.98 J	ND	ND	1	ND	ND	0.14 J	R	ND	0.021	ND	0.18 J	R
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	0.0074 J	ND	ND	ND	0.011	ND	R	0.004 J	0.01 J	0.007 J	ND	R
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	11	ND	ND	2.3	0.0022 J	0.0063	1.4	0.011 J	ND	0.052	ND	0.21 J	R
100-42-5	STYRENE	--	--	mg/kg	3.6	ND	ND	6.1	0.038	0.025	38	0.0039 J	0.0014 J	4.2	0.0084	ND	R
108-88-3	TOLUENE	.7	500	mg/kg	210	ND	ND	63	0.0024 J	0.01	38	0.0073 J	0.0013 J	2.7	0.1	ND	0.011 J
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	88	0.0012 J	0.22 J	22	0.1	0.098	14	0.079 J	0.0022 J	3	0.0033 J	3.1	0.0092 J
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	33	0.017	0.056 J	8.5	0.025	0.033	5.1	0.027 J	0.0022 J	1.1	0.0015 J	0.9	0.007 J
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	**780**	ND	ND	54	0.0095 J	0.072	38	0.026 J	ND	5.9	0.031	0.59 J	0.0095 J
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	310	0.012	ND	22	0.011	0.049	19	0.012 J	ND	2.4	0.011	0.71	0.0084 J
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	**1100**	ND	ND	76	0.02	0.12	57	0.038 J	ND	8.3	0.042	1.3 J	0.018 J
	TOTAL VOCs	--	--	mg/kg	2275.25	0.0583	0.416	263.82	0.1971	0.4008	170.07	0.1917	0.0261	21.0768	0.3854	8.38	0.0739

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI- 3 PDI- 3 (7-9) D2144-02 7 - 9 FT CTECH D2144 SOIL 3/30/2012 12:00 8/20/2012	PDI- 3 PDI- 3(15-17) D2144-03 15 - 17 FT CTECH D2144 SOIL 4/2/2012 8:00 8/20/2012	PDI- 4 PDI- 4(13-15) D2144-08 13 - 15 FT CTECH D2144 SOIL 4/4/2012 12:30 8/20/2012	PDI- 4 PDI- 4(35-36.5) D2144-09 35 - 36.5 FT CTECH D2144 SOIL 4/5/2012 7:45 8/20/2012	PDI- 5 PDI- 5(40-42) D2436-01 40 - 42 FT CTECH D2436 SOIL 4/23/2012 15:40 8/20/2012	PDI- 7 PDI- 7 (5-7) D2144-10 5 - 7 FT CTECH D2144 SOIL 4/4/2012 11:55 8/20/2012	PDI- 7 PDI- 7(41-43) D2144-12 41 - 43 FT CTECH D2144 SOIL 4/5/2012 10:10 8/20/2012	PDI-10 PDI-10(14.5-15) D2680-02 14.5 - 15 FT CTECH D2680 SOIL 5/8/2012 13:50 8/20/2012	PDI-11 PDI-11(10-12) D2144-05 10 - 12 FT CTECH D2144 SOIL 3/30/2012 14:15 8/20/2012	PDI-11 PDI-11(40-41) D2144-04 40 - 41 FT CTECH D2144 SOIL 4/2/2012 11:20 8/20/2012	PDI-12 PDI-12 (5-7) D2144-06 5 - 7 FT CTECH D2144 SOIL 4/3/2012 10:00 8/20/2012	PDI-12 PDI-12(10-12.5) D2144-07 10 - 12.5 FT CTECH D2144 SOIL 4/3/2012 10:35 8/20/2012	PDI-16 PDI-16 (5-7) D2680-03 5 - 7 FT CTECH D2680 SOIL 5/9/2012 11:05 8/20/2012
	SEMIVOLATILES															
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	0.16 J	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	1.4	ND	ND	ND	ND	ND	2.6	ND	ND	ND	2.7	ND
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	ND	1.3	0.58	ND	ND	ND	ND	ND	ND	0.55	ND	ND
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	0.8 J	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	0.91 J	1.2	0.34 J	0.42	0.28 J	ND	0.84 J	0.37 J	1 J	0.43	ND	0.44	0.31 J
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	PAHs															
83-32-9	ACENAPHTHENE	20	500	mg/kg	1.3	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	0.78	ND
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	3.7	0.49 J	ND	ND	ND	ND	7.1	ND	ND	ND	ND	ND	ND
120-12-7	ANTHRACENE	100	500	mg/kg	3.9	0.63 J	ND	ND	ND	ND	7.2	ND	ND	ND	ND	0.25 J	0.16 J
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	4.3	0.76 J	ND	ND	ND	ND	**7.8**	ND	ND	ND	ND	ND	0.28 J
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	**3.1**	0.48 J	ND	ND	ND	ND	**5.4**	ND	ND	ND	ND	ND	0.24 J
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	2.4	ND	ND	ND	ND	ND	4.3	ND	ND	ND	ND	ND	0.2 J
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	0.88 J	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	1.1 J	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND
218-01-9	CHRYSENE	1	56	mg/kg	4.3	0.73 J	ND	ND	ND	ND	7.5	ND	ND	ND	ND	ND	0.32 J
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	ND	ND	ND	ND	0.54 J	ND	ND	ND	ND	ND	ND
206-44-0	FLUORANTHENE	100	500	mg/kg	12	1.7	0.17 J	ND	0.29 J	1.5 J	18	ND	0.77 J	ND	ND	0.26 J	0.61
86-73-7	FLUORENE	30	500	mg/kg	14	2	ND	ND	0.36 J	1.1 J	20	ND	ND	ND	ND	0.41	0.28 J
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	0.84 J	ND	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	5.2	0.85 J	0.18 J	0.72	0.58	1 J	11	ND	ND	0.81	ND	45	ND
91-20-3	NAPHTHALENE	12	500	mg/kg	21	2.1	0.56	7.6	5.6	1.4 J	110	0.7	ND	7.5	ND	11	ND
85-01-8	PHENANTHRENE	100	500	mg/kg	41	6.4	0.21 J	ND	1.2	3.7	71	ND	0.81 J	ND	ND	0.99	0.95
129-00-0	PYRENE	100	500	mg/kg	16	2.7	0.22 J	ND	0.42	2.2	23	ND	1.4	ND	ND	0.45	1.1
	TOTAL PAHs			mg/kg	135.02	18.84	1.34	8.32	8.45	10.9	299.64	0.7	2.98	8.31	ND	59.14	4.14
	TOTAL SVOCs			mg/kg	138.13	21.34	2.26	8.74	8.89	10.9	304.38	1.07	3.98	9.29	0	62.28	4.45
	OTHER															
57-12-5	CYANIDE	27	27	mg/kg	ND	ND	0.079 J	5.4	0.09 J	0.322	1	0.269 J	ND	0.232 J	0.107 J	ND	0.195 J

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-16 PDI-16(25-30) D2680-04 25 - 30 FT CTECH D2680 SOIL 5/9/2012 13:25 8/20/2012	PDI-17 PDI-17(11-13) D1836-01 11 - 13 FT CTECH D1836 SOIL 3/12/2012 12:30 8/20/2012	PDI-17 PDI-17(37-37.75) D1836-02 37 - 37.75 FT CTECH D1836 SOIL 3/13/2012 12:40 8/20/2012	PDI-18 PDI-18(13-15) D1956-08 13 - 15 FT CTECH D1956 SOIL 3/20/2012 10:44 8/20/2012	PDI-18 PDI-18(15-17) D1956-09 15 - 17 FT CTECH D1956 SOIL 3/20/2012 11:07 8/20/2012	PDI-19 PDI-19(10-15) D2780-01 10 - 15 FT CTECH D2780 SOIL 5/15/2012 10:50 8/20/2012	PDI-20 PDI-20(12-14) D2780-04 12 - 14 FT CTECH D2780 SOIL 5/15/2012 10:29 8/20/2012	PDI-20 PDI-20(14-16) D2780-05 14 - 16 FT CTECH D2780 SOIL 5/15/2012 10:42 8/20/2012	PDI-21 PDI-21(5-7.5) D2436-02 5 - 7.5 FT CTECH D2436 SOIL 4/24/2012 9:00 8/20/2012	PDI-22 PDI-22(5-10) D2680-05 5 - 10 FT CTECH D2680 SOIL 5/10/2012 9:58 8/20/2012	PDI-23 PDI-23(5-10) D2780-02 5 - 10 FT CTECH D2780 SOIL 5/17/2012 9:15 8/20/2012	PDI-24 PDI-24(15-17) D1836-04 15 - 17 FT CTECH D1836 SOIL 3/14/2012 11:32 8/20/2012	PDI-24 PDI-24(23-25) D1836-05 23 - 25 FT CTECH D1836 SOIL 3/15/2012 11:00 8/20/2012
CAS NO.	COMPOUND			UNITS:												
	VOLATILES															
67-64-1	ACETONE	.05	500	mg/kg	0.049 J	0.011 J	ND	0.018 J	0.018 J	0.12 J	0.11	0.1	0.042	ND	0.02 J	ND	ND
71-43-2	BENZENE	.06	44	mg/kg	0.01 J	0.55 J	**63**	ND	ND	0.0093 J	0.028	0.016	0.0084	0.0041 J	0.044	21	**220**
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND	ND	R	0.0014 J	ND	ND	0.004 J	ND	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	ND	0.0056 J	0.58 J	ND	ND	R	ND	ND	0.02	0.0013 J	ND	ND	ND
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	0.0048 J	ND	ND	ND	R	0.0026 J	ND	ND	ND	0.0024 J	ND	ND
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND	ND	R	ND	ND	0.0033 J	ND	ND	ND	ND
100-41-4	ETHYLBENZENE	1	390	mg/kg	0.0028 J	0.75 J	19	0.0044 J	ND	0.04 J	0.017	0.0039 J	3.6	0.1	0.08	71	99
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	ND	0.26 J	0.63 J	ND	ND	0.0043 J	0.0042 J	0.0058 J	0.74	0.023	0.01	15	4.5 J
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	ND	0.013 J	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	ND	0.004 J	ND	ND	ND	R	ND	0.0013 J	0.018	ND	ND	ND	ND
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	ND	ND	ND	R	ND	ND	0.0021 J	ND	ND	ND	ND
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	ND	0.11 J	3.3 J	ND	ND	0.002 J	0.003 J	0.0031 J	0.16	0.01	0.0028 J	6.4	18
100-42-5	STYRENE	--	--	mg/kg	0.0079 J	0.6 J	64	0.0083 J	ND	R	ND	ND	0.0096	ND	ND	ND	430
108-88-3	TOLUENE	.7	500	mg/kg	0.0064 J	0.71 J	130	0.0033 J	ND	R	0.0016 J	ND	0.017	0.0024 J	0.007	7.4	**610**
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	0.0071 J	1.1	31	0.0091 J	0.0029 J	0.041 J	0.016	0.0051 J	5.2	0.14	0.034	86	**200**
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	0.0018 J	0.19 J	12	0.0025 J	ND	0.011 J	ND	ND	1.8	0.024	0.005 J	23	61
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	0.0054 J	1.1 J	85	0.0099 J	ND	0.043 J	0.0036 J	0.0021 J	2.6	0.039	0.04	25	410
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	0.0031 J	0.74 J	32	0.0067 J	0.0017 J	0.022 J	0.0024 J	ND	1.5	0.034	0.038	26	200
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	0.0086 J	1.8 J	120	0.017 J	0.0017 J	0.065 J	0.006 J	0.0021 J	4.1	0	0.078	51	**610**
	TOTAL VOCs	--	--	mg/kg	0.0935	6.1484	440.51	0.0622	0.0226	0.2926	0.1898	0.1373	15.7204	0.3818	0.2832	280.8	2252.5

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-16 PDI-16(25-30) D2680-04 25 - 30 FT CTECH D2680 SOIL 5/9/2012 13:25 8/20/2012	PDI-17 PDI-17(11-13) D1836-01 11 - 13 FT CTECH D1836 SOIL 3/12/2012 12:30 8/20/2012	PDI-17 PDI-17(37-37.75) D1836-02 37 - 37.75 FT CTECH D1836 SOIL 3/13/2012 12:40 8/20/2012	PDI-18 PDI-18(13-15) D1956-08 13 - 15 FT CTECH D1956 SOIL 3/20/2012 10:44 8/20/2012	PDI-18 PDI-18(15-17) D1956-09 15 - 17 FT CTECH D1956 SOIL 3/20/2012 11:07 8/20/2012	PDI-19 PDI-19(10-15) D2780-01 10 - 15 FT CTECH D2780 SOIL 5/15/2012 10:50 8/20/2012	PDI-20 PDI-20(12-14) D2780-04 12 - 14 FT CTECH D2780 SOIL 5/15/2012 10:29 8/20/2012	PDI-20 PDI-20(14-16) D2780-05 14 - 16 FT CTECH D2780 SOIL 5/15/2012 10:42 8/20/2012	PDI-21 PDI-21(5-7.5) D2436-02 5 - 7.5 FT CTECH D2436 SOIL 4/24/2012 9:00 8/20/2012	PDI-22 PDI-22(5-10) D2680-05 5 - 10 FT CTECH D2680 SOIL 5/10/2012 9:58 8/20/2012	PDI-23 PDI-23(5-10) D2780-02 5 - 10 FT CTECH D2780 SOIL 5/17/2012 9:15 8/20/2012	PDI-24 PDI-24(15-17) D1836-04 15 - 17 FT CTECH D1836 SOIL 3/14/2012 11:32 8/20/2012	PDI-24 PDI-24(23-25) D1836-05 23 - 25 FT CTECH D1836 SOIL 3/15/2012 11:00 8/20/2012
	SEMIVOLATILES																
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	ND	ND	0.3 J	ND	ND	ND	ND	ND	1.2	ND	ND	3.6	30
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	ND	ND	ND	ND	0.59 J	ND	ND	ND	ND	0.22 J	ND	ND	ND
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3
132-64-9	DIBENZOFURAN	7	350	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	6.2
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	0.32 J	0.62	0.56	0.94 J	0.98 J	0.31 J	0.27 J	0.19 J	0.24 J	0.32 J	0.61 J	1.1 J	1.4
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	PAHs																
83-32-9	ACENAPHTHENE	20	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.57	0.54	ND	18	16
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.16 J	ND	ND	1.7	120
120-12-7	ANTHRACENE	100	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.31 J	0.27 J	ND	7.4	48
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.25 J	0.28 J	ND	**6.5**	**39**
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	0.28 J	ND	**3.3**	**23**
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.19 J	0.34 J	ND	2.7	**20**
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	6.7
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.95 J	3.8
218-01-9	CHRYSENE	1	56	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.26 J	0.28 J	ND	7.2	44
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.6**
206-44-0	FLUORANTHENE	100	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.56	0.65	0.48 J	6.5	42
86-73-7	FLUORENE	30	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.61	0.36 J	ND	8.4	72
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.83 J	**7**
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	ND	0.3 J	1.8	ND	ND	ND	ND	ND	24	1.1	ND	40	490
91-20-3	NAPHTHALENE	12	500	mg/kg	0.48	1.8	18	ND	0.62 J	0.41	ND	ND	11	5.8	0.59 J	41	**980**
85-01-8	PHENANTHRENE	100	500	mg/kg	ND	ND	0.16 J	ND	ND	ND	ND	ND	1.7	1	0.65 J	28	170
129-00-0	PYRENE	100	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.77	0.75	0.49 J	12	75
	TOTAL PAHs			mg/kg	0.48	2.1	19.96	ND	0.62	0.41	ND	ND	40.58	11.65	2.21	185.68	2158.1
	TOTAL SVOCs			mg/kg	0.8	2.72	20.82	0.94	2.19	0.72	0.27	0.19	42.02	12.19	2.82	191.38	2198
	OTHER																
57-12-5	CYANIDE	27	27	mg/kg	3.1	ND	0.426	ND	ND	ND	0.157 J	0.425	0.13 J	2.2	0.1 J	0.323	23

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-25 PDI-25(13-15) D2044-07 13 - 15 FT CTECH D2044 SOIL 3/26/2012 10:30 8/20/2012	PDI-25 PDI-25(15-17) D2044-08 15 - 17 FT CTECH D2044 SOIL 3/26/2012 11:02 8/20/2012	PDI-26 PDI-26(16-22) D2275-13 16 - 22 FT CTECH D2275 SOIL 4/19/2012 9:30 8/20/2012	PDI-27 PDI-27(35-37) D2275-06 35 - 37 FT CTECH D2275 SOIL 4/18/2012 10:20 8/20/2012	PDI-28 PDI-28(5-7) D2275-12 5 - 7 FT CTECH D2275 SOIL 4/19/2012 12:50 8/20/2012	PDI-29 PDI-29 (9-10) D3031-01 9 - 10 FT CTECH D3031 SOIL 6/6/2012 12:17 8/20/2012	PDI-29 PDI-29(31-35) D3031-02 31 - 35 FT CTECH D3031 SOIL 6/7/2012 14:10 8/20/2012	PDI-30 PDI-30(25-27) D2275-07 25 - 27 FT CTECH D2275 SOIL 4/17/2012 9:45 8/20/2012	PDI-31 PDI-31(10-12) D2044-04 10 - 12 FT CTECH D2044 SOIL 3/27/2012 10:10 8/20/2012	PDI-31 PDI-31(5-10) D2044-01 5 - 10 FT CTECH D2044 SOIL 3/27/2012 9:35 8/20/2012	PDI-32 PDI-32(13-15) D2044-06 13 - 15 FT CTECH D2044 SOIL 3/28/2012 11:20 8/20/2012	PDI-32 PDI-32(5-7) D2044-05 5 - 7 FT CTECH D2044 SOIL 3/28/2012 9:30 8/20/2012	PDI-33 PDI-33(10-12) D1956-06 10 - 12 FT CTECH D1956 SOIL 3/22/2012 8:50 8/20/2012
CAS NO.	COMPOUND			UNITS:													
	VOLATILES																
67-64-1	ACETONE	.05	500	mg/kg	0.057 J	0.035	0.039	0.012 J	0.059	0.019 J	0.024 J	ND	0.0085 J	0.049 J	0.0062 J	0.026 J	0.062 J
71-43-2	BENZENE	.06	44	mg/kg	0.086 J	0.0064	0.38 J	2.7	ND	0.023	0.031	0.038	ND	ND	ND	ND	0.016 J
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	0.0052 J	0.014	0.014	0.0024 J	ND	ND	0.0043 J	ND	ND	ND	ND	ND	ND
75-15-0	CARBON DISULFIDE	--	--	mg/kg	ND	0.0037 J	0.003 J	0.0019 J	0.0028 J	0.0013 J	0.0035 J	0.0022 J	ND	ND	ND	ND	0.0091 J
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	0.0025 J	0.0018 J	ND	ND	ND	ND	ND	ND	ND	ND
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND	0.0019 J	ND	ND	ND	ND	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	0.0047 J	0.0027 J	ND	ND	ND	ND	ND	ND	ND	ND	0.069 J
100-41-4	ETHYLBENZENE	1	390	mg/kg	2.1	0.17	0.79	0.47 J	0.0017 J	0.1	2.9	0.16	ND	0.012	ND	ND	7.8
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	0.18 J	0.12	0.17 J	0.011	ND	0.019	0.13	0.021	ND	0.0096	ND	ND	6.3
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	0.0035 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	0.0086 J	ND	ND	ND	0.014 J	ND	ND	ND	ND	ND	ND	ND	ND
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	0.0021 J	0.006 J	0.02	0.0077	ND	ND	0.0027 J	ND	ND	ND	ND	ND	0.3 J
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	0.0039 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	0.059 J	0.087	0.14	0.022	ND	0.0086	0.077	0.0085	ND	0.0062	ND	ND	3.8
100-42-5	STYRENE	--	--	mg/kg	0.014 J	0.0083	0.0038 J	0.4 J	ND	0.0016 J	0.056	0.0077	ND	ND	ND	ND	0.14 J
108-88-3	TOLUENE	.7	500	mg/kg	0.057 J	0.0063	0.094 J	1.5	ND	0.013	0.4 J	0.026	ND	ND	ND	ND	0.042 J
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	1.8	4.4	1.6	0.5 J	0.004 J	0.12	2.5	0.14	0.0013 J	0.03	ND	ND	52
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	0.24 J	1.2	0.39 J	0.085	0.0012 J	0.018	0.77	0.022	ND	0.02	ND	ND	19
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	1.2	0.12	0.44 J	0.97 J	0.0016 J	0.064	2.9	0.098	ND	0.0034 J	ND	ND	15
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	0.76	0.12	0.23 J	0.47 J	ND	0.046	1.3	0.07	ND	0.0077	ND	ND	6.3
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	2	0.24	0.67 J	1.4 J	0 J	0.11	4.2	0.17	ND	0.011	ND	ND	21
	TOTAL VOCs	--	--	mg/kg	6.5689	6.3002	4.3224	7.1572	0.088	0.4335	11.0985	0.5934	0.0098	0.1379	0.0062	0.026	110.8381

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-25 PDI-25(13-15) D2044-07 13 - 15 FT CTECH D2044 SOIL 3/26/2012 10:30 8/20/2012	PDI-25 PDI-25(15-17) D2044-08 15 - 17 FT CTECH D2044 SOIL 3/26/2012 11:02 8/20/2012	PDI-26 PDI-26(16-22) D2275-13 16 - 22 FT CTECH D2275 SOIL 4/19/2012 9:30 8/20/2012	PDI-27 PDI-27(35-37) D2275-06 35 - 37 FT CTECH D2275 SOIL 4/18/2012 10:20 8/20/2012	PDI-28 PDI-28(5-7) D2275-12 5 - 7 FT CTECH D2275 SOIL 4/19/2012 12:50 8/20/2012	PDI-29 PDI-29 (9-10) D3031-01 9 - 10 FT CTECH D3031 SOIL 6/6/2012 12:17 8/20/2012	PDI-29 PDI-29(31-35) D3031-02 31 - 35 FT CTECH D3031 SOIL 6/7/2012 14:10 8/20/2012	PDI-30 PDI-30(25-27) D2275-07 25 - 27 FT CTECH D2275 SOIL 4/17/2012 9:45 8/20/2012	PDI-31 PDI-31(10-12) D2044-04 10 - 12 FT CTECH D2044 SOIL 3/27/2012 10:10 8/20/2012	PDI-31 PDI-31(5-10) D2044-01 5 - 10 FT CTECH D2044 SOIL 3/27/2012 9:35 8/20/2012	PDI-32 PDI-32(13-15) D2044-06 13 - 15 FT CTECH D2044 SOIL 3/28/2012 11:20 8/20/2012	PDI-32 PDI-32(5-7) D2044-05 5 - 7 FT CTECH D2044 SOIL 3/28/2012 9:30 8/20/2012	PDI-33 PDI-33(10-12) D1956-06 10 - 12 FT CTECH D1956 SOIL 3/22/2012 8:50 8/20/2012
	SEMIVOLATILES																
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	3.3	2.3	ND	ND	ND	0.21 J	ND	ND	ND	ND	ND	ND	0.64
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	0.96 J	ND	ND	0.27 J	ND	ND	ND	0.29 J	ND	ND	ND	ND	0.23 J
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	0.85 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	ND	ND	0.78 J	0.85 J	1 J	0.59	0.44	0.79 J	0.66	0.61	0.58	0.71	0.44
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	PAHs																
83-32-9	ACENAPHTHENE	20	500	mg/kg	12	8.8	ND	ND	ND	0.89	ND	0.21 J	ND	ND	ND	ND	ND
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	1.6 J	1.3 J	ND	ND	ND	ND	0.25 J	ND	ND	ND	ND	ND	0.81
120-12-7	ANTHRACENE	100	500	mg/kg	7.2	5.6	0.17 J	ND	ND	0.28 J	0.18 J	0.39	ND	ND	ND	ND	0.5
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	**6.1**	5.1	0.27 J	ND	ND	ND	ND	0.74	ND	0.36 J	ND	ND	0.4 J
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	**3.4**	**3.1**	0.21 J	ND	ND	ND	ND	0.51	ND	0.32 J	ND	ND	0.2 J
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	2.8	2.4	0.27 J	ND	ND	ND	ND	0.77	ND	0.29 J	ND	ND	0.19 J
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	1.4 J	1.4 J	ND	ND	ND	ND	ND	0.44	ND	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	1.3 J	1.3 J	ND	ND	ND	ND	ND	0.18 J	ND	ND	ND	ND	ND
218-01-9	CHRYSENE	1	56	mg/kg	7.9	6.5	0.26 J	ND	ND	0.19 J	ND	1.5	ND	0.37 J	ND	ND	0.43
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
206-44-0	FLUORANTHENE	100	500	mg/kg	6.7	6	0.69	0.17 J	ND	0.36 J	0.18 J	1.1	ND	0.32 J	ND	ND	0.44
86-73-7	FLUORENE	30	500	mg/kg	8.3	6	ND	ND	ND	0.55	0.2 J	0.31 J	ND	ND	ND	ND	0.68
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	0.89 J	0.89 J	ND	ND	ND	ND	ND	0.19 J	ND	ND	ND	ND	ND
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	33	23	0.9	0.39 J	ND	0.77	0.73	0.52	ND	ND	ND	ND	9.9
91-20-3	NAPHTHALENE	12	500	mg/kg	47	32	4.2	1.4	ND	4.6	1.6	1.6	ND	ND	ND	ND	25
85-01-8	PHENANTHRENE	100	500	mg/kg	28	22	0.65	0.31 J	ND	1.3	0.64	2.9	ND	ND	ND	ND	1.6
129-00-0	PYRENE	100	500	mg/kg	11	9.8	0.54	0.18 J	ND	0.45	0.25 J	2.1	ND	0.56	ND	ND	0.67
	TOTAL PAHs			mg/kg	178.59	135.19	8.16	2.45	ND	9.39	4.03	13.46	ND	2.22	ND	ND	40.82
	TOTAL SVOCs			mg/kg	183.7	137.49	8.94	3.57	1	10.19	4.47	14.54	0.66	2.83	0.58	0.71	42.13
	OTHER																
57-12-5	CYANIDE	27	27	mg/kg	2.9	14	0.351	3.5	0.14 J	0.771	ND	1.5	ND	0.237 J	1.3	0.05 J	0.368

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-33 PDI-33(5-7) D1956-04 5 - 7 FT CTECH D1956 SOIL 3/21/2012 13:35 8/20/2012	Dup of PDI-33(5-7) PDI-33 PDI-33A(5-7) D1956-05 5 - 7 FT CTECH D1956 SOIL 3/21/2012 13:40 8/20/2012	PDI-34 PDI-34(5-7) D2275-01 5 - 7 FT CTECH D2275 SOIL 4/13/2012 9:50 8/20/2012	Dup of PDI-34(5-7) PDI-34 PDI-34A(5-7) D2275-04 5 - 7 FT CTECH D2275 SOIL 4/13/2012 10:00 8/20/2012
CAS NO.	COMPOUND			UNITS:				
	VOLATILES							
67-64-1	ACETONE	.05	500	mg/kg	0.041 J	0.14 J	0.085	0.12
71-43-2	BENZENE	.06	44	mg/kg	ND	ND	0.002 J	0.0032 J
104-51-8	N-BUTYLBENZENE	12	500	mg/kg	ND	ND	ND	ND
135-98-8	SEC-BUTYLBENZENE	11	500	mg/kg	ND	ND	ND	ND
75-15-0	CARBON DISULFIDE	--	--	mg/kg	0.0014 J	0.029 J	ND	0.002 J
67-66-3	CHLOROFORM	.37	350	mg/kg	ND	ND	ND	ND
74-87-3	CHLOROMETHANE	--	--	mg/kg	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND
100-41-4	ETHYLBENZENE	1	390	mg/kg	0.0019 J	ND	0.0062	0.011
98-82-8	ISOPROPYLBENZENE (CUMENE)	--	--	mg/kg	ND	ND	ND	ND
79-20-9	METHYL ACETATE	--	--	mg/kg	ND	ND	ND	ND
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	.12	500	mg/kg	0.0065 J	0.011 J	ND	ND
108-87-2	METHYLCYCLOHEXANE	--	--	mg/kg	ND	ND	ND	ND
75-09-2	METHYLENE CHLORIDE	.05	500	mg/kg	ND	ND	ND	ND
103-65-1	N-PROPYLBENZENE	3.9	500	mg/kg	ND	ND	ND	ND
100-42-5	STYRENE	--	--	mg/kg	ND	ND	0.0015 J	0.0036 J
108-88-3	TOLUENE	.7	500	mg/kg	ND	ND	0.0028 J	0.0053 J
95-63-6	1,2,4-TRIMETHYLBENZENE	3.6	190	mg/kg	0.0065 J	ND	0.0054 J	0.0049 J
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	mg/kg	0.0018 J	ND	0.0014 J	ND
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	.26	500	mg/kg	0.003 J	ND	0.0054 J	0.01 J
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	.26	500	mg/kg	ND	ND	0.0038 J	0.007
1330-20-7	XYLENES, TOTAL	.26	500	mg/kg	0.003 J	ND	0.0092 J	0.017
	TOTAL VOCs	--	--	mg/kg	0.0621	0.18	0.1135	0.167

Table 4
Detected Compound Summary of VOC and SVOCSs in Soil Samples
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU2 Validated Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-33 PDI-33(5-7) D1956-04 5 - 7 FT CTECH D1956 SOIL 3/21/2012 13:35 8/20/2012	Dup of PDI-33(5-7) PDI-33 PDI-33A(5-7) D1956-05 5 - 7 FT CTECH D1956 SOIL 3/21/2012 13:40 8/20/2012	PDI-34 PDI-34(5-7) D2275-01 5 - 7 FT CTECH D2275 SOIL 4/13/2012 9:50 8/20/2012	Dup of PDI-34(5-7) PDI-34 PDI-34A(5-7) D2275-04 5 - 7 FT CTECH D2275 SOIL 4/13/2012 10:00 8/20/2012
	SEMIVOLATILES							
91-58-7	2-CHLORONAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND
52-32-8	2-METHYLPHENOL	--	--	mg/kg	ND	ND	ND	ND
100-52-7	BENZALDEHYDE	--	--	mg/kg	ND	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	--	mg/kg	ND	ND	ND	ND
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	--	--	mg/kg	ND	ND	ND	0.25 J
86-74-8	CARBAZOLE	--	--	mg/kg	ND	ND	ND	ND
132-64-9	DIBENZOFURAN	7	350	mg/kg	ND	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	--	--	mg/kg	0.39 J	0.4 J	0.75 J	1 J
86-30-6	N-NITROSODIPHENYLAMINE	--	--	mg/kg	ND	ND	ND	ND
	PAHs							
83-32-9	ACENAPHTHENE	20	500	mg/kg	ND	ND	ND	ND
208-96-8	ACENAPHTHYLENE	100	500	mg/kg	ND	ND	ND	ND
120-12-7	ANTHRACENE	100	500	mg/kg	ND	ND	ND	ND
56-55-3	BENZO(A)ANTHRACENE	1	5.6	mg/kg	ND	ND	ND	ND
50-32-8	BENZO(A)PYRENE	1	1	mg/kg	ND	ND	ND	ND
205-99-2	BENZO(B)FLUORANTHENE	1	5.6	mg/kg	ND	ND	ND	ND
191-24-2	BENZO(G,H,I)PERYLENE	100	500	mg/kg	ND	ND	ND	ND
207-08-9	BENZO(K)FLUORANTHENE	.8	56	mg/kg	ND	ND	ND	ND
218-01-9	CHRYSENE	1	56	mg/kg	ND	ND	ND	ND
53-70-3	DIBENZ(A,H)ANTHRACENE	.33	0.56	mg/kg	ND	ND	ND	ND
206-44-0	FLUORANTHENE	100	500	mg/kg	0.21 J	ND	ND	ND
86-73-7	FLUORENE	30	500	mg/kg	ND	ND	ND	ND
193-39-5	INDENO(1,2,3-C,D)PYRENE	.5	5.6	mg/kg	ND	ND	ND	ND
91-57-6	2-METHYLNAPHTHALENE	--	--	mg/kg	ND	ND	ND	ND
91-20-3	NAPHTHALENE	12	500	mg/kg	ND	ND	ND	ND
85-01-8	PHENANTHRENE	100	500	mg/kg	0.2 J	ND	ND	0.26 J
129-00-0	PYRENE	100	500	mg/kg	0.19 J	ND	ND	0.19 J
	TOTAL PAHs			mg/kg	0.6	ND	ND	0.45
	TOTAL SVOCs			mg/kg	0.99	0.4	0.75	1.7
	OTHER							
57-12-5	CYANIDE	27	27	mg/kg	ND	ND	0.096 J	0.104 J

Notes:
(1) 6NYCRR Part 375 Environmental Remediation Programs (December 14, 2006).
(2) -- indicates no cleanup objective or background level is available.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6NYCRR Part 375 Unrestricted Soil Cleanup Objectives.
(6) Bold and shaded values exceed 6NYCRR Part 375 Commericial Soil Cleanup Objectives.
(7) R indicates rejected data.

Table 5
Detected Compound Summary of Inorganics in Soil Samples
Former West 45th Street Gas Works Site - OU2
Alternative Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU 2 Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives 12/14/2006	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives 12/14/2006	Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	TP-11 (6.5 FEET) R1163-02 6.5' Chemtech R1163 Soil 1/13/2003 4/22/2003	TP-14 (6 FEET) R1163-01 6' Chemtech R1163 Soil 1/13/2003 4/22/2003	MW1-0709 R2145-02 7-9' CHEMTECH R2145 Soil 4/10/2003 6/8/2003	MW2-0507 R2209-03 5-7' ChemTech R2209 Soil 4/17/2003 6/9/2003	MW3-0911 R2004-05 9-11' Chemtech R2004-05 Soil 4/2/2003 7/2/2003	MW3-2325 R2029-01 23-25' Chemtech R2029 Soil 4/3/2003 5/6/2003	MW4-0911 R2260-03 9-11' ChemTech R2260 Soil 4/21/2003 6/10/2003	MW5-1113 R2260-01 11-13' ChemTech R2260 Soil 4/21/2003 6/10/2003	MW6-0507 R2209-04 5-7' ChemTech R2209 Soil 4/17/2003 6/9/2003	MW6-1113 R2209-05 11-13' ChemTech R2209 Soil 4/17/2003 6/9/2003	SB3-0507 R2004-02 5-7' Chemtech R2004 Soil 4/1/2003 7/2/2003
CAS NO.	COMPOUND			UNITS:											
	METALS														
7429-90-5	Aluminum	--	--	mg/Kg	17500	7120	9140	13800	7740	10000	7230	8220	7020	8470	4960
7440-36-0	Antimony	--	--	mg/Kg	ND	ND	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND
7440-38-2	Arsenic	13	16	mg/Kg	4.6	2.1	2.1	3.6	3.3	3.3	4	2.5	2.9	2	3
7440-39-3	Barium	350	400	mg/Kg	105 J	93.3 J	129 J	184	101 J	201 J	83.3 J	106 J	96.4	130	37.4 J
7440-41-7	Beryllium	7.2	590	mg/Kg	0.62 J	0.36 J	0.36 J	0.42 J	0.45 J	0.36 J	0.36 J	0.41 J	0.46 J	0.35 J	0.34 J
7440-43-9	Cadmium	2.5	9.3	mg/Kg	ND	ND	ND	0.35 J	0.06 J	0.18 J	0.22 J	0.2 J	0.22 J	ND	0.48 J
7440-70-2	Calcium	--	--	mg/Kg	2790	6430	4660	4320	3730	23200	7750	3120	17400	7350	1320
7440-47-3	Chromium	--	--	mg/Kg	34.7	16.1	21.2	27.6	16.7 J	26 J	14.5	14.7	16.6	19.7	13.5
7440-48-4	Cobalt	--	--	mg/Kg	19.2	8.4	10.3	15.2	12.1 J	13.1 J	6.2	8.9	8.5	9.2	6.6 J
7440-50-8	Copper	50	270	mg/Kg	33.7	22.6	41.2	41.3	20.6	50.9	14.8	19.7	21.8	14.2	16.8
57-12-5	Cyanide	27	27	mg/Kg	ND	ND	ND	ND	ND	4.54	ND	ND	ND	ND	ND
7439-89-6	Iron	--	--	mg/Kg	31200	14900	17900	26100	16100	18900	15000	17100	14900	15700	13900
7439-92-1	Lead	63	1,000	mg/Kg	27.3	53.6	72.8	85.2	52.9	29.8	28.6	33.6	122	26.8	7
7439-95-4	Magnesium	--	--	mg/Kg	7230 J	3650 J	4850 J	6330	3470 J	8100 J	3470 J	3620 J	3290	5150	1880 J
7439-96-5	Manganese	1,600	10,000	mg/Kg	508	285	325 J	235 J	465 J	728 J	381	354	309 J	374 J	722 J
7439-97-6	Mercury	0.18	2.8	mg/Kg	0.3	0.15	0.07	0.22	0.13	0.04	0.04 J	0.04 J	0.17	0.1	0.02
7440-02-0	Nickel	30	310	mg/Kg	22.5	13.2	15.6	21	14.7	17	12.7	15.7	14.4	15	11.5
7440-09-7	Potassium	--	--	mg/Kg	3600	2760	4380 J	6950 J	2390 J	6120 J	1010 J	2490 J	2720 J	4630 J	480 J
7782-49-2	Selenium	3.9	1,500	mg/Kg	1.7	1.1	0.66 J	ND	ND	ND	0.96	1	ND	ND	0.68
7440-22-4	Silver	2	1,500	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7440-23-5	Sodium	--	--	mg/Kg	353 J	273 J	158 J	345 J	197 J	367 J	126 J	138 J	506 J	305 J	125 J
7440-28-0	Thallium	--	--	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7440-62-2	Vanadium	--	--	mg/Kg	74	28.8	39.7	67.9	27.2 J	51.5 J	18.1	20.8	28.5	31.4	16.1 J
7440-66-6	Zinc	109	10,000	mg/Kg	82.3	46.3	113	172	47.9 J	45.9 J	41.4 J	74.4 J	108	48.6	128 J
	TCLP														
7439-92-1	Lead[8]	5000		µg/L	ND	42	60.6	70.6	ND	38	74.4	43.6	55.1	38.4	ND

Notes:
(1) NYSDEC 6 NYCRR Part 375 Environmental Remediation Programs (December 2006)
(2) -- indicates no cleanup objective is developed by NYSDEC.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6 NYCRR Part 375 Unrestricted use Soil Cleanup Objectives.
(6) **Bold** and sahded values exceed 6 NYCRR Part 375 Restricted Soil Cleanup Objectives for Commercial Use.
(7) Shaded and italicized values exceed TCLP concentration for Lead.

Table 5
Detected Compound Summary of Inorganics in Soil Samples
Former West 45th Street Gas Works Site - OU2
Alternative Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU 2 Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives 12/14/2006	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives 12/14/2006	Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	SB-5 12-14 R1334-05 12-14' Chemtech R1334 Soil 1/27/2003 4/22/2003	SB-5 16-16.5 R1334-06 16-16.5' Chemtech R1334 Soil 1/27/2003 4/22/2003	SB6-0507 R2004-03 5-7' ChemTech R2004 Soil 4/2/2003 7/2/2003	SB7-0507 R2004-01 5-7' ChemTech R2004 Soil 4/1/2003 7/2/2003	SB8-1113 R2279-03 11-13' ChemTech R2279 Soil 4/23/2003 6/11/2003	SB8-2527 R2279-06 25-27' ChemTech R2279 Soil 4/23/2003 6/11/2003	SB8-2527DUP R2279-07 25-27' ChemTech R2279 Soil 4/23/2003 6/11/2003	SB-09-11-13 R2068-01 11-13' Chemtech R2068 Soil 4/4/2003 5/7/2003	SB10-3335 R2176-02 33-35' Chemtech R2176 Soil 4/14/2003 6/8/2003	SB11-0507 R2260-05 5-7' ChemTech R2260 Soil 4/22/2003 6/10/2003	SB-12(10-12) R1359-01 10-12' Chemtech R1359 Soil 1/28/2003 4/22/2003
CAS NO.	COMPOUND			UNITS:											
	METALS														
7429-90-5	Aluminum	--	--	mg/Kg	8860	19300	8310	3600	5090	13000	12800	9980	8010	11400	11600 J
7440-36-0	Antimony	--	--	mg/Kg	0.65 J	0.77 J	ND	0.51 J	ND	ND	ND	0.45 J	ND	ND	0.56 J
7440-38-2	Arsenic	13	16	mg/Kg	2.2	1 J	2.9	1.9	2	0.62 J	0.95 J	3.3	6	2.6	2.4
7440-39-3	Barium	350	400	mg/Kg	79	**555**	105 J	41.5 J	81.1	157	196	147 J	201	185 J	158
7440-41-7	Beryllium	7.2	590	mg/Kg	0.4 J	0.28 J	0.37 J	0.22 J	0.28 J	0.55 J	0.56	0.4 J	0.33 J	0.48 J	0.38 J
7440-43-9	Cadmium	2.5	9.3	mg/Kg	0.1 J	0.36 J	0.19	0.31 J	ND	ND	ND	0.23 J	0.14 J	0.43 J	ND
7440-70-2	Calcium	--	--	mg/Kg	49600	5250	9590	4650	2240	1500	2030	23400	7760	6660	28400 J
7440-47-3	Chromium	--	--	mg/Kg	20.1	47.2	17.8 J	10.6 J	10.8	20.1	20.3	107 J	14.5	26.3	23.9
7440-48-4	Cobalt	--	--	mg/Kg	7.2	24.8	10.8 J	4.6 J	5.5 J	19	18.5	11.5 J	7.2	13.4	13.4
7440-50-8	Copper	50	270	mg/Kg	18.3	39.7	26.5	15.9	13.5	30	23.3	21.1	20.5	32.5	36.1
57-12-5	Cyanide	27	27	mg/Kg	ND	ND	ND	ND	ND	ND	ND	3.35	ND	ND	ND
7439-89-6	Iron	--	--	mg/Kg	9730	31400	15800	8900	8970	14600	15200	22600	14300	24600	20200
7439-92-1	Lead	63	1,000	mg/Kg	70.8	37.9	94.4	117	16.6	173	327	53.2	1000	61.5	19.8
7439-95-4	Magnesium	--	--	mg/Kg	10600	11000	5170 J	2890 J	2310	10100	9830	4930 J	3820	5610 J	5720 J
7439-96-5	Manganese	1,600	10,000	mg/Kg	198	220	290 J	206 J	197	202	212	300 J	282	461	372 J
7439-97-6	Mercury	0.18	2.8	mg/Kg	0.14	0.06	0.12 J	0.07	0.28 J	0.04 J	0.03 J	0.19	0.15	0.09 J	0.1 J
7440-02-0	Nickel	30	310	mg/Kg	18.4	31.8	18.7	7.9	11.3	35.6	34.6	25.7	12.8	18.2	22.5
7440-09-7	Potassium	--	--	mg/Kg	3280 J	8020 J	3650 J	709 J	935 J	9650 J	9310 J	5310 J	2560 J	6100 J	6670
7782-49-2	Selenium	3.9	1,500	mg/Kg	ND	ND	0.51 J	1	ND	ND	ND	0.52 J	ND	1.3	1
7440-22-4	Silver	2	1,500	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.72 J
7440-23-5	Sodium	--	--	mg/Kg	214 J	ND	184 J	108 J	152 J	375 J	369 J	237 J	446 J	119 J	119 J
7440-28-0	Thallium	--	--	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7440-62-2	Vanadium	--	--	mg/Kg	22.9 J	101 J	26.9 J	12 J	12.2	19	19.1	32.8 J	25.6	57.6	39.8 J
7440-66-6	Zinc	109	10,000	mg/Kg	73.4 J	90.5 J	75.4 J	98.6 J	33.1	138	176	74.3 J	137	65.9 J	60.9 J
	TCLP														
7439-92-1	Lead[8]	5000		µg/L	76.5	131	110	273	50	*9220*	*14800*	35	*7520*	67.3	ND

Notes:
(1) NYSDEC 6 NYCRR Part 375 Environmental Remediation Programs (December 2006)
(2) -- indicates no cleanup objective is developed by NYSDEC.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6 NYCRR Part 375 Unrestricted use Soil Cleanup Objectives.
(6) **Bold** and sahded values exceed 6 NYCRR Part 375 Restricted Soil Cleanup Objectives for Commer
(7) Shaded and italicized values exceed TCLP concentration for Lead.

Table 5
Detected Compound Summary of Inorganics in Soil Samples
Former West 45th Street Gas Works Site - OU2
Alternative Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU 2 Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives 12/14/2006	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives 12/14/2006	Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	SB-12(19-19.9) R1359-02 19-19.9' Chemtech R1359 Soil 1/28/2003 4/22/2003	SB15-0507 R2230-01 5-7' ChemTech R2230 Soil 4/18/2003 6/9/2003	SB17-1012 R2209-02 10-12' ChemTech R2209 Soil 4/17/2003 6/9/2003	SB-18 20-22FT R1243-04 20-22' Chemtech R1243 Soil 1/16/2003 4/19/2003	SB-18 24-26FT R1243-05 24-26' Chemtech R1243 Soil 1/16/2003 4/19/2003	SB-19 8-10FT R1285-03 8-10' Chemtech R1285 Soil 1/21/2003 4/21/2003	SB-19 32-34FT R1285-04 32-34' Chemtech R1285 Soil 1/21/2003 4/21/2003	SB-20 32-34FT R1334-01 32-34' Chemtech R1334 Soil 1/23/2003 4/22/2003	SB-20 34-35FT R1334-02 34-35' Chemtech R1334 Soil 1/23/2003 4/22/2003	SB-21 6-8 R1334-03 6-8' Chemtech R1334 Soil 1/24/2003 4/22/2003	SB-21 20-21.5 R1334-04 20-21.5' Chemtech R1334 Soil 1/24/2003 4/22/2003
CAS NO.	COMPOUND			UNITS:											
	METALS														
7429-90-5	Aluminum	--	--	mg/Kg	4950 J	8040	10500	25700	19500	7110	6740	7210	7020	8540	9330
7440-36-0	Antimony	--	--	mg/Kg	0.28 J	ND	ND	ND	ND	ND	ND	ND	3.7 J	ND	0.54 J
7440-38-2	Arsenic	13	16	mg/Kg	0.36 J	5.3	2.6	4.5	4.6	3.7	2.5	5.7	**73.6**	1.6	1.9
7440-39-3	Barium	350	400	mg/Kg	211	106	142	**536**	346	60.5	68.2	128	**2040**	123	141
7440-41-7	Beryllium	7.2	590	mg/Kg	0.25 J	0.43 J	0.4 J	0.42 J	0.31 J	0.35 J	0.39 J	0.4 J	0.56 J	0.36 J	0.42 J
7440-43-9	Cadmium	2.5	9.3	mg/Kg	ND	0.31 J	ND	ND	ND	ND	ND	0.34 J	6.7	0.29 J	0.18 J
7440-70-2	Calcium	--	--	mg/Kg	5810 J	17500	3020	14800	11300	34700	4990	6300	9740	8080	2610
7440-47-3	Chromium	--	--	mg/Kg	13.8	17.2	24.1	60.6	49	8.9 J	17.8 J	15.5	18.5	19.8	32.2
7440-48-4	Cobalt	--	--	mg/Kg	6.8	10	12.6	25.8	23.2	4.5 J	8	7.6	14.7	9.8	11.5
7440-50-8	Copper	50	270	mg/Kg	36.7	32.4	24.2	77.1	43	12.3 J	20.2 J	21.9	87.6	25.9	38.4
57-12-5	Cyanide	27	27	mg/Kg	ND	ND	ND	ND	ND	ND	ND	2.12	**93**	0.914	ND
7439-89-6	Iron	--	--	mg/Kg	9990	22900	19600	46600	38900	10600	16200	14500	73200	14300	21100
7439-92-1	Lead	63	1,000	mg/Kg	4.6	328	117	28.7	39.6	37.3	37.6	293	**5540**	83.4	32.6
7439-95-4	Magnesium	--	--	mg/Kg	3790 J	5150	5920	15900	11100	21500	2960	3790	3600	5360	4410
7439-96-5	Manganese	1,600	10,000	mg/Kg	567 J	398 J	354 J	492 J	405 J	733	369	271	240	339	435
7439-97-6	Mercury	0.18	2.8	mg/Kg	ND	0.19	0.17	0.23	0.16	0.06	0.09	1.1	0.2	0.04	0.24
7440-02-0	Nickel	30	310	mg/Kg	10.6	17.3	27.4	29.7	31.8	8.6	13.3	19.7	27.2	18.6	17.3
7440-09-7	Potassium	--	--	mg/Kg	3130	2800	6010 J	22600 J	16400 J	1260 J	1480 J	1740 J	1750 J	3790 J	4060 J
7782-49-2	Selenium	3.9	1,500	mg/Kg	0.59	ND	ND	4.4	3	ND	0.64 J	ND	2.9	ND	ND
7440-22-4	Silver	2	1,500	mg/Kg	ND	ND	ND	0.64 J	0.43 J	ND	ND	ND	ND	ND	ND
7440-23-5	Sodium	--	--	mg/Kg	ND	161 J	228 J	273 J	325 J	560 J	280 J	ND	ND	ND	ND
7440-28-0	Thallium	--	--	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7440-62-2	Vanadium	--	--	mg/Kg	22.2 J	32.5	32.2	132	93.2	23.6	20.9	20.6 J	28.8 J	28.4 J	45.5 J
7440-66-6	Zinc	109	10,000	mg/Kg	24 J	239	114	107	104	24.1	39.2	130 J	2060 J	107 J	54.6 J
	TCLP														
7439-92-1	Lead[8]	5000		µg/L	ND	34.5	430	107	146	ND	48.6	255	2280	ND	ND

Notes:
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(2) -- indicates no cleanup objective is developed by NYSDEC.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6 NYCRR Part 375 Unrestricted use Soil Cleanup Objectives.
(6) **Bold** and sahded values exceed 6 NYCRR Part 375 Restricted Soil Cleanup Objectives for Commer
(7) Shaded and italicized values exceed TCLP concentration for Lead.

Table 5
Detected Compound Summary of Inorganics in Soil Samples
Former West 45th Street Gas Works Site - OU2
Alternative Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU 2 Soil Analytical Data Detected Compound Summary		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives 12/14/2006	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives 12/14/2006	Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	SB-22 16-18FT R1243-02 16-18' Chemtech R1243 Soil 1/15/2003 4/19/2003	SB-22 24-25FT R1243-03 24-25' Chemtech R1243 Soil 1/15/2003 4/19/2003	SB-23 9-11FT R1285-01 9-11' Chemtech R1285 Soil 1/20/2003 4/21/2003	SB-23 22-24.5FT R1285-02 22-24.5' Chemtech R1285 Soil 1/20/2003 4/21/2003	SB24-0507 R2286-02 5-7' ChemTech R2286 Soil 4/24/2003 6/13/2003	SB24-0507DUP R2286-03 5-7' ChemTech R2286 Soil 4/24/2003 6/13/2003	TAR DRIP R1359-03 Chemtech R1359 Soil 1/28/2003 4/22/2003	PUR-1 R2279-02 ChemTech R2279 Soil 4/23/2003 6/11/2003
CAS NO.	COMPOUND			UNITS:								
	METALS											
7429-90-5	Aluminum	--	--	mg/Kg	6880	8820	13500	7650	11100	12500	4860 J	211 J
7440-36-0	Antimony	--	--	mg/Kg	ND	ND	ND	ND	ND	ND	ND	15.3 J
7440-38-2	Arsenic	13	16	mg/Kg	1.7	2.3	4.3	2	1.6	2.3	2.5	**86.1 J**
7440-39-3	Barium	350	400	mg/Kg	94.1	65.4	309	80.1	211	317	55.3	89.8 J
7440-41-7	Beryllium	7.2	590	mg/Kg	0.4 J	0.53 J	0.32 J	0.49 J	0.33 J	0.33 J	0.29 J	0.1 J
7440-43-9	Cadmium	2.5	9.3	mg/Kg	ND	ND	ND	ND	0.07 J	0.08 J	ND	2.3 J
7440-70-2	Calcium	--	--	mg/Kg	2500 J	1440	15200	3560	3300	4480	7020 J	3000 J
7440-47-3	Chromium	--	--	mg/Kg	18.4 J	20.8	31.8 J	20.7 J	24.9	27.5	11.6	9.9 J
7440-48-4	Cobalt	--	--	mg/Kg	9.9	9.1	14.9	9.5	14	15.3	5.3 J	5.3 J
7440-50-8	Copper	50	270	mg/Kg	21.5	19.2	26 J	22 J	23.8	22.5	19.7	**350 J**
57-12-5	Cyanide	27	27	mg/Kg	ND	ND	ND	ND	ND	ND	ND	**40 J**
7439-89-6	Iron	--	--	mg/Kg	16200 J	17600	28900	16700	18600	20400	12400	47900 J
7439-92-1	Lead	63	1,000	mg/Kg	33.7 J	31.4	44.8	39.2	57.4	329	83.5	449 J
7439-95-4	Magnesium	--	--	mg/Kg	3520 J	2780	9940	3290	5820	6960	2350 J	232 J
7439-96-5	Manganese	1,600	10,000	mg/Kg	323 J	321 J	549	314	258	319	357 J	138 J
7439-97-6	Mercury	0.18	2.8	mg/Kg	0.09	0.19	0.06	0.07	0.07 J	0.06 J	0.2 J	0.06 J
7440-02-0	Nickel	30	310	mg/Kg	18.8 J	15.6	19.4	15	20.9	22.2	10.5	31.6 J
7440-09-7	Potassium	--	--	mg/Kg	17100 J	1790 J	9790 J	2550 J	7530 J	8690 J	853	1580 J
7782-49-2	Selenium	3.9	1,500	mg/Kg	ND	ND	1.5	ND	ND	ND	0.82	5.7 J
7440-22-4	Silver	2	1,500	mg/Kg	ND	ND	ND	ND	ND	ND	0.55 J	2.3 J
7440-23-5	Sodium	--	--	mg/Kg	6590 J	254 J	351 J	236 J	211 J	220 J	284 J	588 J
7440-28-0	Thallium	--	--	mg/Kg	ND	ND	ND	0.39 J	ND	ND	ND	ND
7440-62-2	Vanadium	--	--	mg/Kg	30 J	29.5	64.7	27.4	56.5	64	14 J	77.9 J
7440-66-6	Zinc	109	10,000	mg/Kg	90.2 J	37.2	61.2	37.6	86.9	107	47.1 J	544 J
	TCLP											
7439-92-1	Lead[8]	5000		µg/L	ND	32.3	34.1	42	373	NA	204	88.2 J

Notes:
(1) NYSDEC 6 NYCRR Part 375 Environmental Remediation Programs (December 2006)
(2) -- indicates no cleanup objective is developed by NYSDEC.
(3) ND indicates compound was not detected.
(4) J indicates an estimated concentration.
(5) Shaded values exceed 6 NYCRR Part 375 Unrestricted use Soil Cleanup Objectives.
(6) **Bold** and sahded values exceed 6 NYCRR Part 375 Restricted Soil Cleanup Objectives for Commer
(7) Shaded and italicized values exceed TCLP concentration for Lead.

Table 6
Detected Compound Summary of Groundwater Results
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU-2 Validated Groundwater Analytical Data Detected Compound Summary		NYSDEC Class GA Groundwater Standards/Guidance Values [1]	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-1 MW-1 R2496-08 Chemtech R2496 Water 5/14/2003 6/14/2003	MW-2 MW-2 R2496-03 Chemtech R2496 Water 5/14/2003 6/14/2003	MW- 2 MW- 2 Y2831-02 Chemtech Y2831 Water 5/22/2007 6/26/2007	MW- 2 MW- 2 D3127-01 Chemtech D3127 WATER 6/18/2012 8/20/2012	MW-3 MW-3 R2496-01 Chemtech R2496 Water 5/13/2003 6/14/2003	MW-4 MW-4 R2496-07 Chemtech R2496 Water 5/14/2003 6/14/2003	MW-4DUP MW-4DUP R2496-09 Chemtech R2496 Water 5/14/2003 6/14/2003	MW-5 MW-5 R2496-04 Chemtech R2496 Water 5/14/2003 6/14/2003
CAS NO.	COMPOUND		UNITS:								
	VOLATILES										
67-64-1	ACETONE	50 (G)	ug/L	ND	ND	ND	ND	ND	ND	ND	ND
78-93-3	2-Butanone	50 (G)	ug/L	ND	ND	ND	ND	ND	ND	ND	ND
104-51-8	N-BUTYLBENZENE	5	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
135-98-8	SEC-BUTYLBENZENE	5	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
67-66-3	CHLOROFORM	7	ug/l	ND	ND	ND	3.6 J	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
98-82-8	ISOPROPYLBENZENE (CUMENE)	5	ug/l	NA	NA	ND	6.9	NA	NA	NA	NA
108-87-2	METHYLCYCLOHEXANE	--	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
103-65-1	N-PROPYLBENZENE	5	ug/l	NA	NA	NA	2.2 J	NA	NA	NA	NA
100-42-5	STYRENE	5	ug/l	3100	1.8 JN	ND	ND	10000	390 JN	440 J	160 J
1634-04-4	TERT-BUTYL METHYL ETHER	10 (G)	ug/l	4.9 J	ND	ND	ND	ND	ND	ND	1.3 J
95-63-6	1,2,4-TRIMETHYLBENZENE	5	ug/l	NA	NA	NA	7.3	NA	NA	NA	NA
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	5	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
	BTEX VOLATILES										
71-43-2	BENZENE	1	ug/l	11000	280	ND	40	45000	4100	4000	1000 J
100-41-4	ETHYLBENZENE	5	ug/l	3100	33	ND	24	13000	4200	4300	990 J
108-88-3	TOLUENE	5	ug/l	16000	6.6	ND	1.4 J	66000	3300	3400	790 J
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	5	ug/l	5500	10	ND	2.4 J	19000	3400	3600	690 J
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	5	ug/l	2400	20 JN	ND	6.9	8200	1400 JN	1500	390 JN
1330-20-7	XYLENES, TOTAL	5	ug/l	7900	30 JN	ND	9.4	27200	4800 JN	5100	1080 JN
	SEMIVOLATILES										
98-86-2	ACETOPHENONE	--	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
92-52-4	BIPHENYL (DIPHENYL)	--	ug/l	NA	NA	NA	ND	NA	NA	NA	NA
86-74-8	CARBAZOLE	--	ug/l	16	ND	ND	ND	24	18	20	3.4 J
132-64-9	DIBENZOFURAN	--	ug/l	4.3 J	ND	1.7 J	ND	8.1 J	4.1 J	4.9 J	3.2 J
131-11-3	DIMETHYL PHTHALATE	50 (G)	ug/l	ND	ND	ND	6.8 J	ND	ND	ND	ND
105-67-9	2,4-DIMETHYLPHENOL	50 (G)	ug/l	ND	ND	ND	ND	9.2 J	ND	ND	ND
95-48-7	2-METHYLPHENOL (O-CRESOL)	1	ug/l	ND	ND	ND	ND	14	ND	ND	ND
MEPH3MEPH	3+4-METHYLPHENOLS	1	ug/l	28	ND	ND	ND	13	2.3 J	2.6 J	ND
108-95-2	PHENOL	1	ug/l	ND	ND	ND	ND	ND	ND	ND	ND
	PAHs										
83-32-9	ACENAPHTHENE	20 (G)	ug/l	10 J	33	36	19	21	69	80	52
208-96-8	ACENAPHTHYLENE	--	ug/l	58	4.7 J	5.9 J	ND	70	75	78 J	11
120-12-7	ANTHRACENE	50 (G)	ug/l	5.7 J	ND	ND	ND	8.9 J	6.5 J	7.7 J	4 J
	FLUORANTHENE	50 (G)	µg/L	2.8 J	1.4 J	ND	ND	6.3 J	2.8 J	3.2 J	2.4 J
86-73-7	FLUORENE	50 (G)	ug/l	ND	4.7 J	2.2 J	ND	78 J	36	43	23
91-57-6	2-METHYLNAPHTHALENE	--	ug/l	300	ND	ND	ND	220	550	630	190
91-20-3	NAPHTHALENE	10 (G)	ug/l	1800	ND	ND	15	1600	2300	2300	290
85-01-8	PHENANTHRENE	50 (G)	ug/l	46	2 J	ND	ND	95 J	59	70	8.7 J
	PYRENE	50 (G)	µg/L	3.8 J	1.8 J	ND	ND	7.8 J	3.4 J	4.1 J	3 J
	TOTAL PAHs		ug/l	2226.3	47.6	44.1	34	2107	3101.7	3216	584.1
	TOTAL SVOCs		ug/l	2274.6	47.6	45.8	40.8	2175.3	3126.1	3243.5	590.7

Notes:
(1) Shaded values exceed NYSDEC Class GA Groundwater Standards and Guidance Values.
(2) -- indicates no standard or guidance value available.
(3) ND indicates compound was not detected.
(4) J indicantes an estimated concentration.
(5) ug/L = micrograms per liter
(6) NA indicates constituent was not analyzed for.
(7) * indicates results were not valid.

Table 6
Detected Compound Summary of Groundwater Results
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU-2 Validated Groundwater Analytical Data Detected Compound Summary		NYSDEC Class GA Groundwater Standards/Guidance Values [1]	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW-1 MW-1 R2496-08 Chemtech R2496 Water 5/14/2003 6/14/2003	MW-2 MW-2 R2496-03 Chemtech R2496 Water 5/14/2003 6/14/2003	MW- 2 MW- 2 Y2831-02 Chemtech Y2831 Water 5/22/2007 6/26/2007	MW- 2 MW- 2 D3127-01 Chemtech D3127 WATER 6/18/2012 8/20/2012	MW-3 MW-3 R2496-01 Chemtech R2496 Water 5/13/2003 6/14/2003	MW-4 MW-4 R2496-07 Chemtech R2496 Water 5/14/2003 6/14/2003	MW-4DUP MW-4DUP R2496-09 Chemtech R2496 Water 5/14/2003 6/14/2003	MW-5 MW-5 R2496-04 Chemtech R2496 Water 5/14/2003 6/14/2003
CAS NO.	COMPOUND		UNITS:								
	INORGANICS										
7429-90-5	Aluminum	--	µg/L	110 J	875	202	NA	1250	78 J	69.8 J	55.1 J
7440-36-0	Antimony	3	µg/L	17.8 J	16.8 J	ND	NA	20.3 J	ND	15.4 J	14.8 J
7440-38-2	Arsenic	25	µg/L	5.9 J	ND	ND	NA	13	6.3 J	7.8 J	ND
7440-39-3	Barium	1000	µg/L	90.9 J	105 J	93.1	NA	87.1 J	55.6 J	59.2 J	148 J
7440-43-9	CADMIUM	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA
7440-70-2	Calcium	--	µg/L	78000	78600	66500	NA	48800	41700	44200	102000
7440-47-3	Chromium	50	µg/L	1.5 J	2.9 J	ND	NA	4.1 J	ND	2.5 J	2.1 J
7440-48-4	Cobalt	--	µg/L	3.5 J	ND	ND	NA	2.4 J	ND	ND	ND
7440-50-8	Copper	200	µg/L	ND	3.3 J	ND	NA	6.2 J	ND	ND	ND
57-12-5	Cyanide	200	µg/L	569	25	ND	1	34	ND	151	21
7439-89-6	Iron	300	µg/L	524	2370	2050	NA	2530	334	384	634
7439-92-1	LEAD	25	ug/l	ND	ND	ND	NA	24.4	4.8	ND	ND
7439-95-4	Magnesium	35000 (G)	µg/L	9490	19100	5180	NA	4540 J	9200	9910	19000
7439-96-5	Manganese	300	µg/L	81.4 J	992 J	395	NA	124 J	245 J	267 J	662 J
7440-02-0	NICKEL	100	ug/l	ND	2.7 J	ND	NA	ND	ND	6.8 J	ND
7440-09-7	Potassium	--	µg/L	40200	22300	47700 J	NA	21400	33100	36200	23500
7440-23-5	Sodium	20000	µg/L	150000	149000	89900	NA	213000	95600	101000	116000
7440-28-0	Thallium	0.5	µg/L	ND	ND	NA	NA	ND	ND	5 J	ND
7440-62-2	Vanadium	--	µg/L	ND	7 J	ND	NA	10.6 J	7.5 J	9.7 J	ND
7440-66-6	ZINC	2000 (G)	ug/l	13.9 J	20.7	35.1	NA	22.8	16.1 J	17.1 J	11.2 J
	DISSOLVED METALS										
	Aluminum	--	µg/L	NA	NA	ND	NA	NA	NA	NA	NA
	Barium	1000	µg/L	NA	NA	68.6	NA	NA	NA	NA	NA
	Calcium	--	µg/L	NA	NA	61800	NA	NA	NA	NA	NA
	Iron	300	µg/L	NA	NA	807	NA	NA	NA	NA	NA
	Magnesium	35000 (G)	µg/L	NA	NA	4510	NA	NA	NA	NA	NA
	Manganese	300	µg/L	NA	NA	345	NA	NA	NA	NA	NA
	Potassium	--	µg/L	NA	NA	46400 J	NA	NA	NA	NA	NA
	Sodium	20000	µg/L	NA	NA	80100	NA	NA	NA	NA	NA
	Zinc	2000 (G)	µg/L	NA	NA	25.8	NA	NA	NA	NA	NA
	OTHER										
16887-00-6	CHLORIDE (AS CL)	250	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
57-12-5	Available CYANIDE	0.2	mg/l	0.063*	0.011*	NA	NA	0.090*	0.014*	0.018*	0.080*
CBOD5	CBOD5	--	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN	Total Nitrogen	--	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
TS	TS	--	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
KN	NITROGEN, KJELDAHL, TOTAL	--	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
PH	PH	--	pH	NA	NA	NA	NA	NA	NA	NA	NA
TSS	TOTAL SUSPENDED SOLIDS	--	mg/l	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
(1) Shaded values exceed NYSDEC Class GA Groundwater Standards and Guidance Values.
(2) -- indicates no standard or guidance value available.
(3) ND indicates compound was not detected.
(4) J indicantes an estimated concentration.
(5) ug/L = micrograms per liter
(6) NA indicates constituent was not analyzed for.
(7) * indicates results were not valid.

Table 6
Detected Compound Summary of Groundwater Results
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU-2 Validated Groundwater Analytical Data Detected Compound Summary		NYSDEC Class GA Groundwater Standards/Guidance Values [1]	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW- 5 MW- 5 Y2831-01 Chemtech Y2831 WATER 5/22/2007 6/26/2007	MW- 5 MW- 5 D3127-10 Chemtech D3127 WATER 6/19/2012 8/20/2012	MW-19 MW-19 Y2831-03 Chemtech Y2831 WATER 5/22/2007 6/26/2007	MW-19 MW-19 D3127-09 Chemtech D3127 WATER 6/19/2012 11:50 8/20/2012	MW-21 MW-21 D3127-07 Chemtech D3127 WATER 6/19/2012 8/20/2012	MW-22 MW-22 D3127-02 Chemtech D3127 WATER 6/18/2012 8/20/2012	MW-22DUP MW-22DUP D3127-03 Chemtech D3127 WATER 6/18/2012 8/20/2012	MW-23 MW-23 D3127-04 Chemtech D3127 WATER 6/19/2012 8:35 8/20/2012
CAS NO.	COMPOUND		UNITS:								
	VOLATILES										
67-64-1	ACETONE	50 (G)	ug/L	ND	ND	21 J	ND	ND	ND	ND	ND
78-93-3	2-Butanone	50 (G)	ug/L	ND	ND	16 J	ND	ND	ND	ND	ND
104-51-8	N-BUTYLBENZENE	5	ug/l	ND	ND	ND	ND	ND	2.2 J	ND	ND
135-98-8	SEC-BUTYLBENZENE	5	ug/l	ND	1.9 J	ND	4 J	2.9 J	0.63 J	0.8 J	1 J
67-66-3	CHLOROFORM	7	ug/l	ND	0.8 J	ND	ND	ND	ND	ND	ND
110-82-7	CYCLOHEXANE	--	ug/l	ND	2.7 J	2.9 J	6.4	ND	ND	ND	2.2 J
98-82-8	ISOPROPYLBENZENE (CUMENE)	5	ug/l	32	63	94	210 J	89	18	21	25
108-87-2	METHYLCYCLOHEXANE	--	ug/l	ND	6.5	ND	ND	ND	ND	ND	5.1
103-65-1	N-PROPYLBENZENE	5	ug/l	ND	26	ND	74	49	7.8	8.8	17
100-42-5	STYRENE	5	ug/l	3.7 J	180	28	38	1100	5.3	5.2	140 J
1634-04-4	TERT-BUTYL METHYL ETHER	10 (G)	ug/l	3.1 J	ND	ND	2.7 J	3.7 J	ND	ND	1.8 J
95-63-6	1,2,4-TRIMETHYLBENZENE	5	ug/l	ND	190 J	ND	440 J	580	87	95	190 J
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	5	ug/l	ND	53	ND	170	150	22	26	61
	BTEX VOLATILES										
71-43-2	BENZENE	1	ug/l	200	1000	32000	55000	13000	16	18	1200
100-41-4	ETHYLBENZENE	5	ug/l	250	960 J	8000	11000	1800	88	91	530
108-88-3	TOLUENE	5	ug/l	110	900 J	13000	9300	5600	14	14	1200
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	5	ug/l	150	750	6800	6100 J	1800	91	94	670
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	5	ug/l	90	430	3000	2700 J	970	49	49	330
1330-20-7	XYLENES, TOTAL	5	ug/l	240	1200	9800	8800 J	2800	140	140	990
	SEMIVOLATILES										
98-86-2	ACETOPHENONE	--	ug/l	ND	ND	16	9.3 J	11	ND	ND	ND
92-52-4	BIPHENYL (DIPHENYL)	--	ug/l	ND	15	17	23	21	ND	ND	4.6 J
86-74-8	CARBAZOLE	--	ug/l	ND	ND	16	23 J	7.3 J	ND	ND	ND
132-64-9	DIBENZOFURAN	--	ug/l	ND	ND	6.7 J	9.2 J	ND	ND	ND	ND
131-11-3	DIMETHYL PHTHALATE	50 (G)	ug/l	ND	ND		ND	ND	ND	ND	ND
105-67-9	2,4-DIMETHYLPHENOL	50 (G)	ug/l	ND	ND	39	ND	24	ND	ND	ND
95-48-7	2-METHYLPHENOL (O-CRESOL)	1	ug/l	ND	ND	21	14	15	ND	ND	ND
MEPH3MEPH	3+4-METHYLPHENOLS	1	ug/l	ND	ND	23	15	12	ND	ND	ND
108-95-2	PHENOL	1	ug/l	ND	ND	53 J	26	ND	ND	ND	ND
	PAHs										
83-32-9	ACENAPHTHENE	20 (G)	ug/l	16	29	27	49	36	5.1 J	5 J	4.5 J
208-96-8	ACENAPHTHYLENE	--	ug/l	3.5 J	11	4.9 J	ND	72	5.1 J	5.2 J	ND
120-12-7	ANTHRACENE	50 (G)	ug/l	1.8 J	ND	4.9 J	4.7 J	7.3 J	ND	ND	ND
	FLUORANTHENE	50 (G)	µg/L	1.8 J	ND	3.5 J	ND	ND	ND	ND	ND
86-73-7	FLUORENE	50 (G)	ug/l	11	20	60	74	28	ND	ND	ND
91-57-6	2-METHYLNAPHTHALENE	--	ug/l	45	220	130	240	400	33	33	54
91-20-3	NAPHTHALENE	10 (G)	ug/l	460	1000	1400	2700	3100	320	320	1600
85-01-8	PHENANTHRENE	50 (G)	ug/l	13	27	61	72	30	ND	ND	ND
	PYRENE	50 (G)	µg/L	2.8 J	ND	4.1 J	ND	ND	ND	ND	ND
	TOTAL PAHs		ug/l	554.9	1307	1695.4	3139.7	3673.3	363.2	363.2	1658.5
	TOTAL SVOCs		ug/l	554.9	1322	1887.1	3259.2	3763.6	363.2	363.2	1663.1

Notes:
(1) Shaded values exceed NYSDEC Class GA Groundwater Standards and Guidance Values.
(2) -- indicates no standard or guidance value available.
(3) ND indicates compound was not detected.
(4) J indicantes an estimated concentration.
(5) ug/L = micrograms per liter
(6) NA indicates constituent was not analyzed for.
(7) * indicates results were not valid.

Table 6
Detected Compound Summary of Groundwater Results
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Consolidated Edison Former West 45th Street Gas Works - OU-2 Validated Groundwater Analytical Data Detected Compound Summary		NYSDEC Class GA Groundwater Standards/Guidance Values [1]	Location ID: Sample ID: Lab Sample Id: Source: SDG: Matrix: Sampled: Validated:	MW- 5 MW- 5 Y2831-01 Chemtech Y2831 WATER 5/22/2007 6/26/2007	MW- 5 MW- 5 D3127-10 Chemtech D3127 WATER 6/19/2012 8/20/2012	MW-19 MW-19 Y2831-03 Chemtech Y2831 WATER 5/22/2007 6/26/2007	MW-19 MW-19 D3127-09 Chemtech D3127 WATER 6/19/2012 11:50 8/20/2012	MW-21 MW-21 D3127-07 Chemtech D3127 WATER 6/19/2012 8/20/2012	MW-22 MW-22 D3127-02 Chemtech D3127 WATER 6/18/2012 8/20/2012	MW-22DUP MW-22DUP D3127-03 Chemtech D3127 WATER 6/18/2012 8/20/2012	MW-23 MW-23 D3127-04 Chemtech D3127 WATER 6/19/2012 8:35 8/20/2012
CAS NO.	COMPOUND		UNITS:								
	INORGANICS										
7429-90-5	Aluminum	--	µg/L	2820	NA	ND	NA	NA	NA	NA	NA
7440-36-0	Antimony	3	µg/L	ND	NA	ND	NA	NA	NA	NA	NA
7440-38-2	Arsenic	25	µg/L	ND	NA	4.78 J	NA	NA	NA	NA	NA
7440-39-3	Barium	1000	µg/L	88.6	NA	870	NA	NA	NA	NA	NA
7440-43-9	CADMIUM	5	ug/l	NA	1.03 J	NA	NA	NA	NA	NA	NA
7440-70-2	Calcium	--	µg/L	77400	NA	195000	NA	NA	NA	NA	NA
7440-47-3	Chromium	50	µg/L	6.47	0.005 U	ND	NA	NA	NA	NA	NA
7440-48-4	Cobalt	--	µg/L	ND	NA	ND	NA	NA	NA	NA	NA
7440-50-8	Copper	200	µg/L	20.9	2.6 U	ND	NA	NA	NA	NA	NA
57-12-5	Cyanide	200	µg/L	ND	41	18	55	788	15	16	234
7439-89-6	Iron	300	µg/L	1530	NA	24500	NA	NA	NA	NA	NA
7439-92-1	LEAD	25	ug/l	8.49	23.9 J	ND	NA	NA	NA	NA	NA
7439-95-4	Magnesium	35000 (G)	µg/L	286 J	NA	43000	NA	NA	NA	NA	NA
7439-96-5	Manganese	300	µg/L	22.4	NA	12500	NA	NA	NA	NA	NA
7440-02-0	NICKEL	100	ug/l	11.5 J	4.11 J	ND	NA	NA	NA	NA	NA
7440-09-7	Potassium	--	µg/L	22600 J	NA	45700 J	NA	NA	NA	NA	NA
7440-23-5	Sodium	20000	µg/L	235000	NA	652000	NA	NA	NA	NA	NA
7440-28-0	Thallium	0.5	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
7440-62-2	Vanadium	--	µg/L	14.9 J	NA	ND	NA	NA	NA	NA	NA
7440-66-6	ZINC	2000 (G)	ug/l	65.7	35.4 J	39.5	NA	NA	NA	NA	NA
	DISSOLVED METALS										
	Aluminum	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Barium	1000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Calcium	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Iron	300	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Magnesium	35000 (G)	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Manganese	300	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Potassium	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Sodium	20000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	Zinc	2000 (G)	µg/L	NA	NA	NA	NA	NA	NA	NA	NA
	OTHER										
16887-00-6	CHLORIDE (AS CL)	250	mg/l	NA	100	NA	NA	NA	NA	NA	NA
57-12-5	Available CYANIDE	0.2	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
CBOD5	CBOD5	--	mg/l	NA	17	NA	NA	NA	NA	NA	NA
NITROGEN	Total Nitrogen	--	mg/l	NA	1.1	NA	NA	NA	NA	NA	NA
TS	TS	--	mg/l	NA	339	NA	NA	NA	NA	NA	NA
KN	NITROGEN, KJELDAHL, TOTAL	--	mg/l	NA	1.1	NA	NA	NA	NA	NA	NA
PH	PH	--	pH	NA	8.45	NA	NA	NA	NA	NA	NA
TSS	TOTAL SUSPENDED SOLIDS	--	mg/l	NA	6	NA	NA	NA	NA	NA	NA

Notes:
(1) Shaded values exceed NYSDEC Class GA Groundwater Standards and Guidance Values.
(2) -- indicates no standard or guidance value available.
(3) ND indicates compound was not detected.
(4) J indicantes an estimated concentration.
(5) ug/L = micrograms per liter
(6) NA indicates constituent was not analyzed for.
(7) * indicates results were not valid.

Table 7
Summary of Solid Waste Characterization Results
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Con Ed - W 45th Street PDI Solid Waste Characteristic Results		Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI- 1WC PDI-1WC(23-25) D1956-03 23 - 25 FT CTECH D1956 SOIL 3/16/2012 13:35 8/20/2012	PDI-3WC PDI-3(7-9)WC D2144-01 7 - 9 FT CTECH D2144 SOIL 3/30/2012 12:00 8/20/2012	PDI-9WC PDI-9(5-15)WC D2144-14 5 - 15 FT CTECH D2144 SOIL 4/6/2012 12:00 8/20/2012	PDI-11WC PDI-11(5-10)WC D2144-13 5 - 10 FT CTECH D2144 SOIL 3/30/2012 14:00 8/20/2012
CAS NO.	COMPOUND	UNITS:				
	PESTICIDES/PCBS					
12674-11-2	PCB-1016 (AROCLOR 1016)	ug/kg	3.6 U	12 U	13 U	12 U
11104-28-2	PCB-1221 (AROCLOR 1221)	ug/kg	3.5 U	12 U	12 U	12 U
11141-16-5	PCB-1232 (AROCLOR 1232)	ug/kg	7.7 U	26 U	27 U	27 U
53469-21-9	PCB-1242 (AROCLOR 1242)	ug/kg	3.5 U	12 U	12 U	12 U
12672-29-6	PCB-1248 (AROCLOR 1248)	ug/kg	6.8 U	23 U	24 U	24 U
11097-69-1	PCB-1254 (AROCLOR 1254)	ug/kg	1.5 U	5.2 U	5.4 U	5.3 U
11096-82-5	PCB-1260 (AROCLOR 1260)	ug/kg	4.2 U	14 U	15 U	15 U
	OTHER					
TPH	TOTAL PETROLEUM HYDROCARBONS	mg/kg	62	960	240	790
	TCLP VOLATILES					
75-35-4TCLP	1,1-Dichloroethene-TCLP	ug/l	2.4 U	2.4 U	2.4 U	2.4 U
107-06-2TCLP	1,2-Dichloroethane-TCLP	ug/l	2.4 U	2.4 U	2.4 U	2.4 U
78-93-3TCLP	2-Butanone-TCLP	ug/l	6.6 U	6.6 U	6.6 U	6.6 U
71-43-2TCLP	Benzene-TCLP	ug/l	1.6 U	1200 D	41	1.6 U
56-23-5TCLP	Carbon Tetrachloride-TCLP	ug/l	3.1 U	3.1 U	3.1 U	3.1 U
108-90-7TCLP	Chlorobenzene-TCLP	ug/l	2.4 U	2.4 U	2.4 U	2.4 U
67-66-3TCLP	Chloroform-TCLP	ug/l	1.7 U	1.7 U	1.7 U	1.7 U
127-18-4TCLP	Tetrachloroethene-TCLP	ug/l	1.4 U	1.4 U	1.4 U	1.4 U
79-01-6TCLP	Trichloroethene-TCLP	ug/l	1.4 U	1.4 U	1.4 U	1.4 U
75-01-4TCLP	Vinyl Chloride-TCLP	ug/l	1.7 U	1.7 U	1.7 U	1.7 U
	TCLP SEMIVOLATILES					
106-46-7TCLP	1,4-Dichlorobenzene-TCLP	ug/l	2 U	2 U	2 U	2 U
95-95-4TCLP	2,4,5-Trichlorophenol-TCLP	ug/l	4 U	4 U	4 U	4 U
88-06-2TCLP	2,4,6-Trichlorophenol-TCLP	ug/l	5.6 UQ	45 J	3.8 U	3.8 U
121-14-2TCLP	2,4-Dinitrotoluene-TCLP	ug/l	10 U	5.6 U	5.6 U	5.6 U
95-48-7TCLP	2-Methylphenol-TCLP	ug/l	2.4 U	10 U	10 U	10 U
65794-96-9TCLP	3+4-Methylphenols-TCLP	ug/l	3.8 U	2.4 U	2.4 U	2.4 U
118-74-1TCLP	Hexachlorobenzene-TCLP	ug/l	1.8 U	1.8 U	1.8 U	1.8 U
87-68-3TCLP	Hexachlorobutadiene-TCLP	ug/l	2.5 U	2.5 U	2.5 U	2.5 U
67-72-1TCLP	Hexachloroethane-TCLP	ug/l	2.5 U	2.5 U	2.5 U	2.5 U
98-95-3TCLP	Nitrobenzene-TCLP	ug/l	6.8 U	6.8 U	6.8 U	6.8 U
87-86-5TCLP	Pentachlorophenol-TCLP	ug/l	17 U	17 U	17 U	17 U
110-86-1TCLP	Pyridine-TCLP	ug/l	20 U	20 U	20 U	20 U
	TCLP PESTICIDES					
57-74-9TCLP	Chlordane-TCLP	ug/l	1 U	1 U	1 U	1 U
72-20-8TCLP	Endrin-TCLP	ug/l	0.058 U	0.058 U	0.058 U	0.058 U
58-89-9TCLP	gamma-BHC-TCLP	ug/l	0.055 U	0.055 U	0.055 U	0.055 U
1024-57-3TCLP	Heptachlor epoxide-TCLP	ug/l	0.067 U	0.067 U	0.067 U	0.067 U
76-44-8TCLP	Heptachlor-TCLP	ug/l	0.069 U	0.069 U	0.069 U	0.069 U
72-43-5TCLP	Methoxychlor-TCLP	ug/l	0.042 U	0.042 U	0.042 U	0.042 U
8001-35-2TCLP	Toxaphene-TCLP	ug/l	1 U	1 U	1 U	1 U
	TCLP HERBICIDES					
93-72-1TCLP	2,4,5-TP (SILVEX)-TCLP	ug/l	1.51 U	1.51 U	1.51 U	1.51 U
94-75-7TCLP	2,4-D-TCLP	ug/l	3.48 U	3.48 U	3.48 U	3.48 U
	TCLP METALS					
7440-38-2TCLP	Arsenic-TCLP	ug/l	42 U	42 U	42 U	42 U
7440-39-3TCLP	Barium-TCLP	ug/l	321 J	1140	948	537
7440-43-9TCLP	Cadmium-TCLP	ug/l	5 U	5 U	5 U	5 U
7440-47-3TCLP	Chromium-TCLP	ug/l	11 U	11 U	11 U	11 U
7439-92-1TCLP	Lead-TCLP	ug/l	79.5	275	148	176
7439-97-6TCLP	Mercury-TCLP	ug/l	0.915 U	0.915 UN	0.915 UN	0.915 UN
7782-49-2TCLP	Selenium-TCLP	ug/l	48 U	48 U	48 U	48 U
7440-22-4TCLP	Silver-TCLP	ug/l	15 U	15 U	15 U	15 U
	WASTE CHARACTERISTICS					
CORROSIVITY (AS PH	Corrosivity (as pH)	pH	8.29	7.73	10	10.52
IGNITABILITY	IGNITABILITY	o C	0	0	0	0
REACTIVE CYANIDE	REACTIVE CYANIDE	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U
REACTIVE SULFIDE	Reactive Sulfide	mg/kg	21	14	13	14
7704-34-9	SULFUR, MOL (S8)	mg/kg	51.4	521 *	2100 *	441 *

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Con Ed - W 45th Street PDI Solid Waste Characteristic Results		Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-13WC PDI-13(10-15)WC D2144-15 10 - 15 FT CTECH D2144 SOIL 4/6/2012 12:20 8/20/2012	PDI-18WC PDI-18WC(11-13) D1956-10 11 - 13 FT CTECH D1956 SOIL 3/20/2012 10:24 8/20/2012	PDI-22WC PDI-22WC(15-20) D2680-06 15 - 20 FT CTECH D2680 SOIL 5/10/2012 10:24 8/20/2012	PDI-23WC PDI-23(10-20)WC D2780-03 10 - 20 FT CTECH D2780 SOIL 5/17/2012 10:05 8/20/2012
CAS NO.	COMPOUND	UNITS:				
	PESTICIDES/PCBS					
12674-11-2	PCB-1016 (AROCLOR 1016)	ug/kg	12 U	12 U	4.3 U	4.2 U
11104-28-2	PCB-1221 (AROCLOR 1221)	ug/kg	12 U	12 U	4.2 U	4.1 U
11141-16-5	PCB-1232 (AROCLOR 1232)	ug/kg	26 U	25 U	9.2 U	9 U
53469-21-9	PCB-1242 (AROCLOR 1242)	ug/kg	12 U	12 U	4.2 U	4.1 U
12672-29-6	PCB-1248 (AROCLOR 1248)	ug/kg	23 U	22 U	8.1 U	7.9 U
11097-69-1	PCB-1254 (AROCLOR 1254)	ug/kg	5.2 U	5 U	1.8 U	1.8 U
11096-82-5	PCB-1260 (AROCLOR 1260)	ug/kg	14 U	14 U	5.1 U	4.9 U
	OTHER					
TPH	TOTAL PETROLEUM HYDROCARBONS	mg/kg	410	2600	180	580
	TCLP VOLATILES					
75-35-4TCLP	1,1-Dichloroethene-TCLP	ug/l	2.4 U	2.4 U	2.4 U	2.4 U
107-06-2TCLP	1,2-Dichloroethane-TCLP	ug/l	2.4 U	2.4 U	2.4 U	2.4 U
78-93-3TCLP	2-Butanone-TCLP	ug/l	6.6 U	6.6 U	6.6 U	6.6 U
71-43-2TCLP	Benzene-TCLP	ug/l	26	1.6 U	1.6 U	130
56-23-5TCLP	Carbon Tetrachloride-TCLP	ug/l	3.1 U	3.1 U	3.1 U	3.1 U
108-90-7TCLP	Chlorobenzene-TCLP	ug/l	2.4 U	2.4 U	2.4 U	2.4 U
67-66-3TCLP	Chloroform-TCLP	ug/l	1.7 U	1.7 U	1.7 U	1.7 U
127-18-4TCLP	Tetrachloroethene-TCLP	ug/l	1.4 U	1.4 U	1.4 U	1.4 U
79-01-6TCLP	Trichloroethene-TCLP	ug/l	1.4 U	1.4 U	1.4 U	1.4 U
75-01-4TCLP	Vinyl Chloride-TCLP	ug/l	1.7 U	1.7 U	1.7 U	1.7 U
	TCLP SEMIVOLATILES					
106-46-7TCLP	1,4-Dichlorobenzene-TCLP	ug/l	2 U	2 U	2 U	2 U
95-95-4TCLP	2,4,5-Trichlorophenol-TCLP	ug/l	4 U	4 U	4 U	4 U
88-06-2TCLP	2,4,6-Trichlorophenol-TCLP	ug/l	3.8 U	5.6 U	5.6 U	5.6 U
121-14-2TCLP	2,4-Dinitrotoluene-TCLP	ug/l	5.6 U	10 U	10 U	10 U
95-48-7TCLP	2-Methylphenol-TCLP	ug/l	10 U	2.4 U	2.4 U	2.4 U
65794-96-9TCLP	3+4-Methylphenols-TCLP	ug/l	2.4 U	3.8 U	3.8 U	3.8 U
118-74-1TCLP	Hexachlorobenzene-TCLP	ug/l	1.8 U	1.8 U	1.8 U	1.8 U
87-68-3TCLP	Hexachlorobutadiene-TCLP	ug/l	2.5 U	2.5 U	2.5 U	2.5 U
67-72-1TCLP	Hexachloroethane-TCLP	ug/l	2.5 U	2.5 U	2.5 U	2.5 U
98-95-3TCLP	Nitrobenzene-TCLP	ug/l	6.8 U	6.8 U	6.8 U	6.8 U
87-86-5TCLP	Pentachlorophenol-TCLP	ug/l	17 U	17 U	17 U	17 U
110-86-1TCLP	Pyridine-TCLP	ug/l	20 U	20 U	20 U	20 U
	TCLP PESTICIDES					
57-74-9TCLP	Chlordane-TCLP	ug/l	1 U	1 U	1 U	1 U
72-20-8TCLP	Endrin-TCLP	ug/l	0.058 U	0.058 U	0.058 U	0.058 U
58-89-9TCLP	gamma-BHC-TCLP	ug/l	0.055 U	0.055 U	0.055 U	0.055 U
1024-57-3TCLP	Heptachlor epoxide-TCLP	ug/l	0.067 U	0.067 U	0.067 U	0.067 U
76-44-8TCLP	Heptachlor-TCLP	ug/l	0.069 U	0.069 U	0.069 U	0.069 U
72-43-5TCLP	Methoxychlor-TCLP	ug/l	0.042 U	0.042 U	0.042 U	0.042 U
8001-35-2TCLP	Toxaphene-TCLP	ug/l	1 U	1 U	1 U	1 U
	TCLP HERBICIDES					
93-72-1TCLP	2,4,5-TP (SILVEX)-TCLP	ug/l	1.51 U	1.51 U	1.51 U	1.51 U
94-75-7TCLP	2,4-D-TCLP	ug/l	3.48 U	3.48 U	3.48 U	3.48 U
	TCLP METALS					
7440-38-2TCLP	Arsenic-TCLP	ug/l	42 U	42 U	42 U	42 U
7440-39-3TCLP	Barium-TCLP	ug/l	1010	466 J	405 J	287 J
7440-43-9TCLP	Cadmium-TCLP	ug/l	5 U	5 U	5 U	5 U
7440-47-3TCLP	Chromium-TCLP	ug/l	11.2 J	28 J	27.2 J	11 U
7439-92-1TCLP	Lead-TCLP	ug/l	1660	26 U	26 U	26 U
7439-97-6TCLP	Mercury-TCLP	ug/l	0.915 UN	0.915 U	0.915 U	0.915 U
7782-49-2TCLP	Selenium-TCLP	ug/l	48 U	48 U	48 U	48 U
7440-22-4TCLP	Silver-TCLP	ug/l	15 U	15 U	15 U	15 U
	WASTE CHARACTERISTICS					
CORROSIVITY (AS PH	Corrosivity (as pH)	pH	8.98	10.41	9.35	11.15
IGNITABILITY	IGNITABILITY	o C	0	0	0	0
REACTIVE CYANIDE	REACTIVE CYANIDE	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U
REACTIVE SULFIDE	Reactive Sulfide	mg/kg	10 U	24	40	16
7704-34-9	SULFUR, MOL (S8)	mg/kg	2180 *	1210 N*	893 N	949 N

Table 7
Summary of Solid Waste Characterization Results
Former West 45th Street Gas Works Site OU-2
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Con Ed - W 45th Street PDI Solid Waste Characteristic Results		Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	PDI-27(10-15)WC PDI-27(10-15)WC D2275-05 10 - 15 FT CTECH D2275 SOIL 4/17/2012 13:45 8/20/2012	PDI-30WC PDI-30WC D2275-08 - CTECH D2275 SOIL 4/9/2012 12:05 8/20/2012
CAS NO.	COMPOUND	UNITS:		
	PESTICIDES/PCBS			
12674-11-2	PCB-1016 (AROCLOR 1016)	ug/kg	12 U	13 U
11104-28-2	PCB-1221 (AROCLOR 1221)	ug/kg	12 U	12 U
11141-16-5	PCB-1232 (AROCLOR 1232)	ug/kg	27 U	27 U
53469-21-9	PCB-1242 (AROCLOR 1242)	ug/kg	12 U	12 U
12672-29-6	PCB-1248 (AROCLOR 1248)	ug/kg	23 U	24 U
11097-69-1	PCB-1254 (AROCLOR 1254)	ug/kg	5.3 U	5.4 U
11096-82-5	PCB-1260 (AROCLOR 1260)	ug/kg	15 U	15 U
	OTHER			
TPH	TOTAL PETROLEUM HYDROCARBONS	mg/kg	470	630
	TCLP VOLATILES			
75-35-4TCLP	1,1-Dichloroethene-TCLP	ug/l	2.4 U	2.4 U
107-06-2TCLP	1,2-Dichloroethane-TCLP	ug/l	2.4 U	2.4 U
78-93-3TCLP	2-Butanone-TCLP	ug/l	6.6 U	6.6 U
71-43-2TCLP	Benzene-TCLP	ug/l	12 J	56
56-23-5TCLP	Carbon Tetrachloride-TCLP	ug/l	3.1 U	3.1 U
108-90-7TCLP	Chlorobenzene-TCLP	ug/l	2.4 U	2.4 U
67-66-3TCLP	Chloroform-TCLP	ug/l	1.7 U	1.7 U
127-18-4TCLP	Tetrachloroethene-TCLP	ug/l	1.4 U	1.4 U
79-01-6TCLP	Trichloroethene-TCLP	ug/l	1.4 U	1.4 U
75-01-4TCLP	Vinyl Chloride-TCLP	ug/l	1.7 U	1.7 U
	TCLP SEMIVOLATILES			
106-46-7TCLP	1,4-Dichlorobenzene-TCLP	ug/l	2 U	2 U
95-95-4TCLP	2,4,5-Trichlorophenol-TCLP	ug/l	4 U	4 U
88-06-2TCLP	2,4,6-Trichlorophenol-TCLP	ug/l	5.6 U	5.6 U
121-14-2TCLP	2,4-Dinitrotoluene-TCLP	ug/l	10 U	10 U
95-48-7TCLP	2-Methylphenol-TCLP	ug/l	2.4 UQ	2.4 UQ
65794-96-9TCLP	3+4-Methylphenols-TCLP	ug/l	3.8 U	3.8 U
118-74-1TCLP	Hexachlorobenzene-TCLP	ug/l	1.8 U	1.8 U
87-68-3TCLP	Hexachlorobutadiene-TCLP	ug/l	2.5 U	2.5 U
67-72-1TCLP	Hexachloroethane-TCLP	ug/l	2.5 U	2.5 U
98-95-3TCLP	Nitrobenzene-TCLP	ug/l	6.8 U	6.8 U
87-86-5TCLP	Pentachlorophenol-TCLP	ug/l	17 U	17 U
110-86-1TCLP	Pyridine-TCLP	ug/l	20 U	20 U
	TCLP PESTICIDES			
57-74-9TCLP	Chlordane-TCLP	ug/l	1 U	1 U
72-20-8TCLP	Endrin-TCLP	ug/l	0.058 U	0.058 U
58-89-9TCLP	gamma-BHC-TCLP	ug/l	0.055 U	0.055 U
1024-57-3TCLP	Heptachlor epoxide-TCLP	ug/l	0.067 U	0.067 U
76-44-8TCLP	Heptachlor-TCLP	ug/l	0.069 U	0.069 U
72-43-5TCLP	Methoxychlor-TCLP	ug/l	0.042 U	0.042 U
8001-35-2TCLP	Toxaphene-TCLP	ug/l	1 U	1 U
	TCLP HERBICIDES			
93-72-1TCLP	2,4,5-TP (SILVEX)-TCLP	ug/l	1.51 U	1.51 U
94-75-7TCLP	2,4-D-TCLP	ug/l	3.48 U	3.48 U
	TCLP METALS			
7440-38-2TCLP	Arsenic-TCLP	ug/l	42 U	42 U
7440-39-3TCLP	Barium-TCLP	ug/l	610	461 J
7440-43-9TCLP	Cadmium-TCLP	ug/l	5 U	5 U
7440-47-3TCLP	Chromium-TCLP	ug/l	42.9 J	20.1 J
7439-92-1TCLP	Lead-TCLP	ug/l	32.2 J	49.9 J
7439-97-6TCLP	Mercury-TCLP	ug/l	0.915 U	0.915 U
7782-49-2TCLP	Selenium-TCLP	ug/l	48 U	48 U
7440-22-4TCLP	Silver-TCLP	ug/l	15 UN	15 UN
	WASTE CHARACTERISTICS			
CORROSIVITY (AS PI	Corrosivity (as pH)	pH	10.52	10.09
IGNITABILITY	IGNITABILITY	o C	0	0
REACTIVE CYANIDE	REACTIVE CYANIDE	mg/kg	0.05 U	0.05 U
REACTIVE SULFIDE	Reactive Sulfide	mg/kg	18	17
7704-34-9	SULFUR, MOL (S8)	mg/kg	732 *	896 *

Notes:
(1) U indicates not detected.
(2) J indicates estimated value.
(3) Q indicates LCS control criteria did not meet requirements.
(4) N indicates presumptive evidence of a compound.
(5) * indicates values outside of QC limits.

Table 8
Summary of Liquid Waste Characterization Results
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Con Ed - W 45th Street OU-2 Liquid Waste Characteristic Results		Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	MW- 5 MW-5 D3127-10 - CTECH D3127 WATER 6/19/2012 13:35 8/20/2012
CAS NO.	COMPOUND	UNITS:	
	VOLATILES		
71-55-6	1,1,1-TRICHLOROETHANE	ug/l	0.3 U
79-34-5	1,1,2,2-TETRACHLOROETHANE	ug/l	0.31 U
76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/l	0.45 U
79-00-5	1,1,2-TRICHLOROETHANE	ug/l	0.38 U
75-34-3	1,1-DICHLOROETHANE	ug/l	0.36 U
75-35-4	1,1-DICHLOROETHENE	ug/l	0.47 U
87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	0.65 U
120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	0.14 U
95-63-6	1,2,4-TRIMETHYLBENZENE	ug/l	190 J
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ug/l	0.46 UJ
106-93-4	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ug/l	0.41 U
95-50-1	1,2-DICHLOROBENZENE	ug/l	0.45 U
107-06-2	1,2-DICHLOROETHANE	ug/l	0.48 U
78-87-5	1,2-DICHLOROPROPANE	ug/l	0.46 U
108-67-8	1,3,5-TRIMETHYLBENZENE (MESITYLENE)	ug/l	53
541-73-1	1,3-DICHLOROBENZENE	ug/l	0.43 U
106-46-7	1,4-DICHLOROBENZENE	ug/l	0.22 U
591-78-6	2-HEXANONE	ug/l	1.9 UJ
67-64-1	ACETONE	ug/l	2.8 UJ
71-43-2	BENZENE	ug/l	1000
74-97-5	BROMOCHLOROMETHANE	ug/l	2.2 U
75-27-4	BROMODICHLOROMETHANE	ug/l	0.36 U
75-25-2	BROMOFORM	ug/l	0.47 U
74-83-9	BROMOMETHANE	ug/l	0.62 U
75-15-0	CARBON DISULFIDE	ug/l	0.54 U
56-23-5	CARBON TETRACHLORIDE	ug/l	0.57 UJ
108-90-7	CHLOROBENZENE	ug/l	0.49 U
75-00-3	CHLOROETHANE	ug/l	0.66 U
67-66-3	CHLOROFORM	ug/l	0.8 J
74-87-3	CHLOROMETHANE	ug/l	0.54 U
156-59-2	CIS-1,2-DICHLOROETHYLENE	ug/l	0.35 U
10061-01-5	CIS-1,3-DICHLOROPROPENE	ug/l	0.31 U
110-82-7	CYCLOHEXANE	ug/l	2.7 J
124-48-1	DIBROMOCHLOROMETHANE	ug/l	0.52 U
75-71-8	DICHLORODIFLUOROMETHANE	ug/l	0.55 U
100-41-4	ETHYLBENZENE	ug/l	960 J
98-82-8	ISOPROPYLBENZENE (CUMENE)	ug/l	63
XYLMP	M,P-XYLENE (SUM OF ISOMERS)	ug/l	750
79-20-9	METHYL ACETATE	ug/l	0.83 UJ
78-93-3	METHYL ETHYL KETONE (2-BUTANONE)	ug/l	1.3 UJ
108-10-1	METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ug/l	2.1 UJ
108-87-2	METHYLCYCLOHEXANE	ug/l	6.5
75-09-2	METHYLENE CHLORIDE	ug/l	0.41 U
104-51-8	N-BUTYLBENZENE	ug/l	0.41 U
103-65-1	N-PROPYLBENZENE	ug/l	26
95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	ug/l	430
135-98-8	SEC-BUTYLBENZENE	ug/l	1.9 J
100-42-5	STYRENE	ug/l	180
98-06-6	T-BUTYLBENZENE	ug/l	0.44 U
1634-04-4	TERT-BUTYL METHYL ETHER	ug/l	0.41 UJ
127-18-4	TETRACHLOROETHYLENE(PCE)	ug/l	0.86 U
108-88-3	TOLUENE	ug/l	900 J
156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	0.41 U
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ug/l	0.29 U
79-01-6	TRICHLOROETHYLENE (TCE)	ug/l	0.28 U
75-69-4	TRICHLOROFLUOROMETHANE	ug/l	0.35 U
75-01-4	VINYL CHLORIDE	ug/l	0.34 U
1330-20-7	XYLENES, TOTAL	ug/l	1200

Table 8
Summary of Liquid Waste Characterization Results
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Con Ed - W 45th Street OU-2 Liquid Waste Characteristic Results		Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	MW- 5 MW-5 D3127-10 - CTECH D3127 WATER 6/19/2012 13:35 8/20/2012
CAS NO.	COMPOUND	UNITS:	
	SEMIVOLATILES		
95-94-3	1,2,4,5-TETRACHLOROBENZENE	ug/l	0.2 U
123-91-1	1,4-DIOXANE (P-DIOXANE)	ug/l	0.2 U
58-90-2	2,3,4,6-TETRACHLOROPHENOL	ug/l	0.2 UJ
95-95-4	2,4,5-TRICHLOROPHENOL	ug/l	0.41 U
88-06-2	2,4,6-TRICHLOROPHENOL	ug/l	0.57 U
120-83-2	2,4-DICHLOROPHENOL	ug/l	0.67 U
105-67-9	2,4-DIMETHYLPHENOL	ug/l	0.72 U
51-28-5	2,4-DINITROPHENOL	ug/l	2.1 UJ
121-14-2	2,4-DINITROTOLUENE	ug/l	1.1 U
606-20-2	2,6-DINITROTOLUENE	ug/l	0.33 U
91-58-7	2-CHLORONAPHTHALENE	ug/l	0.16 U
95-57-8	2-CHLOROPHENOL	ug/l	0.55 U
91-57-6	2-METHYLNAPHTHALENE	ug/l	220
95-48-7	2-METHYLPHENOL (O-CRESOL)	ug/l	0.24 U
88-74-4	2-NITROANILINE	ug/l	0.5 U
88-75-5	2-NITROPHENOL	ug/l	0.53 U
MEPH3MEPH	3+4-Methylphenols	ug/l	0.39 U
99-09-2	3-NITROANILINE	ug/l	1.1 U
534-52-1	4,6-DINITRO-2-METHYLPHENOL	ug/l	0.76 U
101-55-3	4-BROMOPHENYL PHENYL ETHER	ug/l	0.23 U
59-50-7	4-CHLORO-3-METHYLPHENOL	ug/l	0.41 U
106-47-8	4-CHLOROANILINE	ug/l	2.9 U
100-01-6	4-NITROANILINE	ug/l	1.4 U
100-02-7	4-NITROPHENOL	ug/l	2 U
83-32-9	ACENAPHTHENE	ug/l	29
208-96-8	ACENAPHTHYLENE	ug/l	11
98-86-2	ACETOPHENONE	ug/l	0.14 U
120-12-7	ANTHRACENE	ug/l	0.16 U
1912-24-9	ATRAZINE	ug/l	0.41 U
100-52-7	BENZALDEHYDE	ug/l	0.79 U
56-55-3	BENZO(A)ANTHRACENE	ug/l	0.16 U
50-32-8	BENZO(A)PYRENE	ug/l	0.14 U
205-99-2	BENZO(B)FLUORANTHENE	ug/l	0.3 U
191-24-2	BENZO(G,H,I)PERYLENE	ug/l	0.3 U
207-08-9	BENZO(K)FLUORANTHENE	ug/l	0.18 U
85-68-7	BENZYL BUTYL PHTHALATE	ug/l	0.19 UJ
92-52-4	BIPHENYL (DIPHENYL)	ug/l	15
111-91-1	BIS(2-CHLOROETHOXY) METHANE	ug/l	0.56 U
111-44-4	BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	ug/l	0.56 U
108-60-1	BIS(2-CHLOROISOPROPYL) ETHER	ug/l	0.17 U
117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	ug/l	0.16 U
105-60-2	CAPROLACTAM	ug/l	2 U
86-74-8	CARBAZOLE	ug/l	0.22 UJ
218-01-9	CHRYSENE	ug/l	0.18 U
53-70-3	DIBENZ(A,H)ANTHRACENE	ug/l	0.43 U
132-64-9	DIBENZOFURAN	ug/l	0.24 U
84-66-2	DIETHYL PHTHALATE	ug/l	0.39 UJ
131-11-3	DIMETHYL PHTHALATE	ug/l	0.22 UJ
84-74-2	DI-N-BUTYL PHTHALATE	ug/l	2 UJ
117-84-0	DI-N-OCTYLPHTHALATE	ug/l	0.52 U
206-44-0	FLUORANTHENE	ug/l	0.41 U
86-73-7	FLUORENE	ug/l	20
87-68-3	HEXACHLOROBUTADIENE	ug/l	0.26 U
77-47-4	HEXACHLOROCYCLOPENTADIENE	ug/l	0.24 U
67-72-1	HEXACHLOROETHANE	ug/l	0.26 U
193-39-5	INDENO(1,2,3-C,D)PYRENE	ug/l	0.15 U
78-59-1	ISOPHORONE	ug/l	0.31 U
91-20-3	NAPHTHALENE	ug/l	1000
98-95-3	NITROBENZENE	ug/l	0.69 U
621-64-7	N-NITROSODI-N-PROPYLAMINE	ug/l	0.2 U
86-30-6	N-NITROSODIPHENYLAMINE	ug/l	0.61 U
87-86-5	PENTACHLOROPHENOL	ug/l	1.8 U
85-01-8	PHENANTHRENE	ug/l	27
108-95-2	PHENOL	ug/l	0.21 U
129-00-0	PYRENE	ug/l	0.2 U

Table 8
Summary of Liquid Waste Characterization Results
Former West 45th Street Gas Works Site OU-2
Alternatives Analysis Report

Con Ed - W 45th Street OU-2 Liquid Waste Characteristic Results		Location ID: Sample ID: Lab Sample Id: Depth: Source: SDG: Matrix: Sampled: Validated:	MW- 5 MW-5 D3127-10 - CTECH D3127 WATER 6/19/2012 13:35 8/20/2012
CAS NO.	COMPOUND	UNITS:	
	PESTICIDES/PCBS		
12674-11-2	PCB-1016 (AROCLOR 1016)	ug/l	0.02 U
11104-28-2	PCB-1221 (AROCLOR 1221)	ug/l	0.02 U
11141-16-5	PCB-1232 (AROCLOR 1232)	ug/l	0.008 U
53469-21-9	PCB-1242 (AROCLOR 1242)	ug/l	0.01 U
12672-29-6	PCB-1248 (AROCLOR 1248)	ug/l	0.015 U
11097-69-1	PCB-1254 (AROCLOR 1254)	ug/l	0.012 U
11096-82-5	PCB-1260 (AROCLOR 1260)	ug/l	0.024 U
	INORGANICS		
7440-43-9	CADMIUM	ug/l	1.03 J
7440-50-8	COPPER	ug/l	2.6 U
7439-92-1	LEAD	ug/l	23.9 J
7439-97-6	MERCURY	ug/l	0.07 U
7440-02-0	NICKEL	ug/l	4.11 J
7440-66-6	ZINC	ug/l	35.4 J
18540-29-9	CHROMIUM, HEXAVALENT	mg/l	0.005 U
	OTHER		
16887-00-6	CHLORIDE (AS CL)	mg/l	100
57-12-5	CYANIDE	mg/l	0.041
CBOD5	CBOD5	mg/l	17
NITRATE	Nitrate+Nitrite	mg/l	0.25 U
NONPOLAR	Nonpolar Material	mg/l	5 U
NITROGEN	Total Nitrogen	mg/l	1.1
TS	TS	mg/l	339
KN	NITROGEN, KJELDAHL, TOTAL	mg/l	1.1
PH	PH	pH	8.45
TSS	TOTAL SUSPENDED SOLIDS	mg/l	6
	WASTE CHARACTERISTICS		
FLASHPOINT	Flashpoint	deg f	0

Notes:
(1) U indicates not detected.
(2) J indicates estimated value.

Table 9
Summary of NAPL Physical Characteristics
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Physical Characteristic	Units	MW-4 NAPL Sample	MW-6 NAPL Sample
Density	g/cm^3	1.1115	1.0732
Viscosity	CentiStoke (cSt)	304.3	140.6
Water by Distillation	Volume %	1.6	32
Interfacial Tension	Millinewton per meterm (N/m)	19.3	20.2
Surface Tension	mN/m	34.8	34.2

Table 10
Summary of Soil Gas Analytical Data
Former West 45th Street Gas Works - OU 2
Alternatives Analysis Report

Consolidated Edison Former W 45th Street Gas Works - OU-2 Validated Soil Gas Analytical Data Detected Compound Summary		Sample ID: Lab Sample Id Depth: Source: SDG: Matrix: Sampled: Validated:	OU-2 SG-1 (1FT) 0603388-05A 1' Air Toxics 603388 Air 3/14/2006 4/28/2006	OU-2 SG-1 (4FT) 0603388-06A 4' Air Toxics 603388 Air 3/14/2006 4/28/2006	OU-2 SG-2 (1FT) 0603388-03A 1' Air Toxics 603388 Air 3/14/2006 4/28/2006	OU-2 SG-2 (4FT) 0603388-04A 4' Air Toxics 603388 Air 3/14/2006 4/28/2006	OU-2 SG-3 (1FT) 0603388-01A 1' Air Toxics 603388 Air 3/14/2006 4/28/2006	OU-2 SG-3 (4FT) 0603388-02A 4' Air Toxics 603388 Air 3/14/2006 4/28/2006
CAS NO.	COMPOUND	UNITS:						
	VOLATILES							
75-71-8	Freon 12	µg/m^3	ND	ND	4.1	3.3	3	3.4
74-87-3	Chloromethane	µg/m^3	ND	ND	ND	ND	1.5	1.6
106-99-0	1,3-Butadiene	µg/m^3	ND	ND	ND	ND	ND	2.7
75-69-4	Freon 11	µg/m^3	ND	ND	5.3	4.4	1.6	2.2
64-17-5	Ethanol	µg/m^3	140	ND	51	19	8.8	16
67-64-1	Acetone	µg/m^3	1200	ND	940 J	150	29	290 J
67-63-0	2-Propanol	µg/m^3	ND	ND	7.5	ND	ND	3.3
75-15-0	Carbon disulfide	µg/m^3	71	ND	27	40	ND	190
110-54-3	Hexane	µg/m^3	160	1500	ND	ND	ND	37
78-93-3	Methyl Ethyl Ketone	µg/m^3	ND	ND	44	6.9	ND	28
67-66-3	Chloroform	µg/m^3	ND	ND	4.4	13	ND	5.4
110-82-7	Cyclohexane	µg/m^3	100	ND	ND	ND	ND	7.4
71-43-2	Benzene	µg/m^3	910	18000	53	7.3	2.8	59
142-82-5	Heptane	µg/m^3	120	1700	11	6.1	ND	23
79-01-6	Trichloroethene	µg/m^3	ND	ND	ND	ND	1.7	ND
108-88-3	Toluene	µg/m^3	3300	62000	51	46	16	150
127-18-4	Tetrachloroethene	µg/m^3	28	ND	44	62	1.5	40
100-41-4	Ethylbenzene	µg/m^3	740	20000	17	20	1	27
1330-20-7	Xylene (m,p)	µg/m^3	420	10000	68	61	3.8	76
95-47-6	Xylene (o)	µg/m^3	110	3000	35	34	1.5	35
100-42-5	Styrene	µg/m^3	ND	ND	ND	ND	ND	3.4
103-65-1	Propylbenzene	µg/m^3	ND	ND	14	10	ND	10
622-96-8	4-Ethyltoluene	µg/m^3	ND	ND	83	56	ND	51
108-67-8	1,3,5-Trimethylbenzene	µg/m^3	21	ND	37	24	0.92	21
95-63-6	1,2,4-Trimethylbenzene	µg/m^3	62	ND	120	83	3.1	73
541-73-1	1,3-Dichlorobenzene	µg/m^3	ND	ND	2.8	ND	ND	ND
565-59-3	2,3-Dimethylpentane	µg/m^3	ND	ND	ND	ND	ND	13
107-83-5	2-Methylpentane	µg/m^3	98	ND	ND	ND	ND	17
496-11-7	Indan	µg/m^3	ND J	ND J	14 J	10 J	ND J	10 J
78-78-4	Isopentane	µg/m^3	350 J	1000 J	140 J	26 J	8.4 J	43 J
91-20-3	Naphthalene	µg/m^3	ND J	ND J	34 J	26 J	ND J	21 J
540-84-1	2,2,4-Trimethylpentane	µg/m^3	1200	ND	440	300	290 J	1100 J

Notes:
(1) ND indicates compound was not detected
(2) J indicates an estimated concentration

Table 11
Geotechnical Test Results - Classification, Moisture Content, pH, Specific Gravity, and Organic Content
Former West 45th Street Gas Works Site - OU-2
Alternative Analysis Report

Boring	Intervals (ft)	Description from Laboratory	USCS Classification - ASTM D2487	Moisture Content - ASTM D2216 (%)	Soil pH - ASTM D4972		Specific Gravity - ASTM D854	Organic Content - ASTM D2974 (%)
					in Distilled Water	in Calcium Chloride		
PDI-1	6 to 8	Moist, grayish brown silty sand with gravel	SM	14.2	6.3	5.8	2.69	0.1
	8 to 10							
	21 to 23	Moist, dark gray silty sand with gravel	SM	6.3	6.6	6.1	--	--
	23 to 25							
PDI-2	6 to 9	Moist, dark brown silty sand	SM	12.7	--	--	--	--
	10 to 13	Moist, dark brown silty sand	--	16.1	8.6	8.0	--	--
PDI-9	9 to 11	Moist, brown silty sand with gravel	SM	21.4	--	--	--	--
	11 to 13	Moist, dark brown silty sand	--	16.8	--	--	--	--
PDI-10	15 to 20	Moist, brown silty, clayey sand	SC-SM	18.3	6.1	5.9	2.71	0.1
PDI-17	17 to 19	Moist, olive brown silty sand with gravel	SM	14.1	7.6	5.8	--	--
	19 to 21							
	25 to 27	Moist, olive brown silty sand	SM	18.3	6.9	6.4	--	--
	27 to 29							
PDI-20	18 to 20	Moist, olive brown clayey sand	SC	18.6	7.2	6.6	--	--
	20 to 22	Moist, olive brown clayey sand	SC	18.2	7.2	6.6	--	--
	22 to 24							
PDI-22	5 to 15	Moist, grayish brown gravel with silt and sand	GP-GM	9.3	8.3	7.9	--	--
PDI-27	5 to 10	Moist, dark brown silty sand with gravel	SM	10.9	8.7	7.9	--	--
	10 to 12.5	Moist, grayish brown sand with silt and gravel	--	12	--	--	--	--
	20 to 25	Moist, brown silty sand with gravel	SM	10.2	--	--	--	--
	35 to 37	Moist, reddish brown silty sand	--	18.8	--	--	--	--
PDI-29	5 to 7	Moist, olive brown gravel with sand	GP	3.5	8.4	6.8	2.69	0.6
	7 to 8	Moist, grayish brown sand with silt and gravel	--	11.8	--	--	--	--
	10 to 13	Moist, grayish brown gravel with silt and sand	GP-GM	8.6	8.7	8.9	--	--
	15 to 16	Moist, dark grayish brown silty sand	--	13.4	--	--	--	--
	24 to 27	Moist, grayish brown silty gravel with sand	--	10.3	--	--	--	--
	31 to 35	Moist, grayish brown silty gravel with sand	GM	7.5	--	--	--	--
CONT-2	20 to 25	Moist, reddish brown silty, clayey sand with gravel	SC-SM	7.1	6.2	5.7	--	--
CONT-8	5 to 10	Moist, grayish brown silty sand with gravel	--	12.1	8.3	7.2	--	--
	10 to 15	Moist, grayish brown silty sand	SM	16.7	--	--	2.68	0.8
	15 to 20	Moist, reddish brown clay (lean clay)	CL	21.7	--	--	--	--
	20 to 25	Moist, reddish brown sand with silt and gravel	--	9	--	--	--	--
PW-2	10 to 15	Moist, dark gray silty sand	--	16.7	--	--	--	--
MW-24	5 to 10	Moist, dark gray silty sand with gravel	SM	18.5	8.2	8	--	--
	10 to 16	Moist, dark grayish brown sandy clay (lean clay)	CL	21.4	--	--	--	--

Note:
(1) '--' indicates test was not performed on the sample.

Table 12
Geotechnical Test Results - Grain Size and Atterberg Limits
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Boring	Intervals (ft)	Description from Laboratory	Moisture Content - ASTM D2216 (%)	Grain Size - ASTM D422					Atterberg Limits - ASTM D4318		
				% Gravel	% Sand	% Fines	% Silt	% Clay (5 μm)	Liquid Limit	Plastic Limit	Plasticity Index
PDI-1	6 to 8	Moist, grayish brown silty sand with gravel	14.2	32.9	53.5	13.6	12.6	1	NP		
	8 to 10										
	21 to 23	Moist, dark gray silty sand with gravel	6.3	32.2	55.1	12.7	10.7	2	NP		
	23 to 25										
PDI-2	6 to 9	Moist, dark brown silty sand	12.7	7.3	69.9	22.8	17.8	5	NP		
	10 to 13	Moist, dark brown silty sand	16.1	8.5	60.3	31.2	--		--		
PDI-9	9 to 11	Moist, brown silty sand with gravel	21.4	23.9	59.7	16.4	13.4	3	NP		
	11 to 13	Moist, dark brown silty sand	16.8	11.5	61.9	26.6	--		--		
PDI-10	15 to 20	Moist, brown silty, clayey sand	18.3	8.6	51.7	39.7	30.7	9	20	14	6
PDI-17	17 to 19	Moist, olive brown silty sand with gravel	14.1	26.4	57.3	16.3	--		NP		
	19 to 21										
	25 to 27	Moist, olive brown silty sand	18.3	6.9	55.6	37.5	--		NP		
	27 to 29										
PDI-20	18 to 20	Moist, olive brown clayey sand	18.6	3.6	48.2	48.2	35.2	13	28	15	13
	20 to 22	Moist, olive brown clayey sand	18.2	10.4	51.6	38	--		29	19	10
	22 to 24										
PDI-22	5 to 15	Moist, grayish brown gravel with silt and sand	9.3	50.4	38.4	11.2	--		NP		
PDI-27	5 to 10	Moist, dark brown silty sand with gravel	10.9	42.1	45.2	12.7	11.7	1	NP		
	10 to 12.5	Moist, grayish brown sand with silt and gravel	12	43.3	46.8	9.9	--		--		
	20 to 25	Moist, brown silty sand with gravel	10.2	27.1	60.3	12.6	--		NP		
	35 to 37	Moist, reddish brown silty sand	18.8	12.7	72	15.3	--		--		
PDI-29	5 to 7	Moist, olive brown gravel with sand	3.5	67.3	30.5	2.2	--		NP		
	7 to 8	Moist, grayish brown sand with silt and gravel	11.8	43.5	46.3	10.2	--		--		
	10 to 13	Moist, grayish brown gravel with silt and sand	8.6	71	21.7	7.3	--		NP		
	15 to 16	Moist, dark grayish brown silty sand	13.4	--					--		
	24 to 27	Moist, grayish brown silty gravel with sand	10.3	33.6	31.1	35.3	--		--		
	31 to 35	Moist, grayish brown silty gravel with sand	7.5	32.6	31.5	35.9	--		NP		
CONT-2	20 to 25	Moist, reddish brown silty, clayey sand with gravel	7.1	18.2	54.6	27.2	17.2	10	18	14	4
CONT-8	5 to 10	Moist, grayish brown silty sand with gravel	12.1	26	53.5	20.5	--		--		
	10 to 15	Moist, grayish brown silty sand	16.7	4.1	58	37.9	--		NP		
	15 to 20	Moist, reddish brown clay (lean clay)	21.7	1.6	5.8	92.6	70.6	22	27	19	8
	20 to 25	Moist, reddish brown sand with silt and gravel	9	31.9	59.2	8.9	--		--		
PW-2	10 to 15	Moist, dark gray silty sand	16.7	--					--		
MW-24	5 to 10	Moist, dark gray silty sand with gravel	18.5	38.2	39.4	22.4	17.4	5	NP		
	10 to 16	Moist, dark grayish brown sandy clay (lean clay)	21.4	3.1	46.3	50.6	41.6	9	28	19	9

Note:
(1) '--' indicates test was not performed on the sample.

Table 13
Preliminary Screening of Alternatives - Soil
Former West 45th Street Gas Works Site - OU2
Alternative Analysis Report

Remedial Alternative	Technology	Process	Applicability
No Action		Does not include any remedial activities or institutional controls	***Not Retained***
Limited Action	Institutional Controls	Site Management Plan	***Retained***
	Engineering Controls	Maintenance and monitoring of cover systems (i.e., asphalt in parking areas, concrete under the building structure, and fill meeting CSCOs/top soil in landscaped areas)	***Retained***
Containment	NAPL Barrier Wall	Lateral containment of the MGP impacts migrating off-site.	***Not Retained***
Removal	Excavation and Off-Site Disposal and Treatment	Removal of MGP-impacted soil material for off-site disposal and treatment.	***Retained***
***In Situ* Physical/Chemical Treatment**	*In Situ* Stabilization/Solidification (ISS) - Depths greater than 15 feet bgs using augers	Mixing contaminated soils with cementitious grout rendering contaminant constituents immoble due to the reduction in hydraulic conductivity.	***Not Retained***
	In Situ Stabilization/Solidification (ISS) - Depths less than 15 feet bgs using bucket mixing	Mixing contaminated soils with cementitious grout rendering contaminant constituents immoble due to the reduction in hydraulic conductivity.	***Retained***
	In Situ Stabilization/Solidification (ISS) - Depths greater than 15 feet bgs using jet grouting	Mixing contaminated soils with cementitious grout rendering contaminant constituents immoble due to the reduction in hydraulic conductivity.	***Retained***
	In situ Thermal Treatment (TSTD/ISTT)	Electro resistant heating for removal of MGP impacts	***Not Retained***
	In Situ Chemical Oxidation (ISCO)	Injection of strong oxidants at high concentrations to destroy organic contaminants.	***Not Retained***
	Surfactant Aided ISCO	Injection of surfactants to loosen the bonds of hydrocarbons and reduce the contaminant mass.	***Not Retained***
	Enhanced Bioremediation (EB)	Nitrate, oxygen release compound or percarbonate is injected to enhance the microbial activity. If necessary, nutrients will be injected as needed.	***Not Retained***

"Retained" indicates that the technology is technically capable of meeting the Remedial Action Objectives by itself or in combination with other technologies.

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
PRE-DESIGN INVESTIGATION		
PDI-1/MW-22	0 - 4	Cobble size stone
		Rapid GW intrusion @ 2.5'
	11	Log note - use of roller bit to get past rock
	28 - 30	Bedrock fragments
	36	Steel, concrete, bedrock
PDI-2	0 - 4	Cobbles and concrete debris
	21 - 39	Brick
	40	Concrete
	> 41	Bedrock
PDI-3	17	Bedrock
PDI-4	7 - 15	Weathered bedrock
	15 - 20	Mixtures of weathered bedrock, soil, concrete
	20 - 25	Log note - use of roller bit to get past obstruction
	35 - 36	Log note - use of roller bit to get past obstruction
	38 - 40	Metal
PDI-5	4 - 5	Cobble, water table @ 5' bgs
	15 - 20	Sonic sampler used to advance through bedrock boulder
	20 -25	Metal
	25	Metal
	30	Metal
	35	Metal, Log note - 'hard drilling'
	40	Concrete
	> 42	Bedrock
PDI-6	0 - 5	Concrete, debris, and cobbles, water table @ 3' bgs
	5 - 8	Log note - roller bit used to get past obstruction
	8 - 10	Weathered bedrock
	12 - 13	Log note - roller bit used to get past obstruction
	> 13	Bedrock
PDI-7	0 - 5	Brick and mortar debris, cobbles, water table @ 2' bgs
	5	Concrete noted in drive shoe
	10 - 13	Auger used due to high blow count
	> 13	Mostly sand, weathered bedrock. Boring ends @ 42' bgs
PDI-8	0 - 2	Water table @ 2' bgs
PDI-9	0 - 5	Concrete on surface, sand with brick fragments below; GW @ 3.5' bgs
	18 - 20	Brick and weathered bedrock
	20 - 35	Brick, brick and mortar
	35 - 36	Concrete
	>36	Bedrock

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
PDI-10	0 - 5	Cobbles; GW @ 2' bgs
	5 - 27	Mostly sand and silt, interval of concrete @ 17' bgs
	> 27	Bedrock
PDI-11	0 - 5	Silt/Sand/Gravel; GW @ 5' bgs
	9	Some wood fragments
	37 - 38	Metal, brick, schist
	> 41	Bedrock
PDI-12	0 - 5	Mix of sand/silt/gravel, brick and woodchips; GW @ 3.5' bgs
	12	Schist boulder in sonic cutting
	>12	Bedrock
PDI-13	0 - 5	Asphalt and cobbles; GW @ 5' bgs
	15 - 20	Brick and wood
	22 - 39	Brick, brick and mortar
	> 39	Bedrock and concrete
PDI-14	4 - 5	Brick; GW @ 5' bgs
PDI-15	0 - 5	GW 5' bgs
	>13	Bedrock
PDI-16	0 - 5	Concrete/Cobble; GW @ 5' bgs
	20 - 25	Log note - difficult drilling, possible metal
	25 - 26	Metal, Concrete
	>30	Bedrock
PDI-17	0 - 5	GW @ 5' bgs
	13 - 17	Log note - no recovery, brick and rock in shoe
	35 - 37	Augered through, augers grinding
	37 - 38	Mix of sand, brick, weather bedrock
	38 - 39	Roller bit used
	>39	Bedrock
		Concrete wall or foundation encountered on first hand clear.
PDI-18/MW-23	5 - 8	Gravel and weathered bedrock
	15 - 19	Mix of weathered bedrock and wood
	19 - 25	No recovery from 19 - 21; roller bit used to 25
	23 - 25	Concrete
	>25	Bedrock
		Auger sheared off @ 33' bgs; first attempt encountered concrete slab @ 2.5' bgs; artestian conditions upon well completion.
PDI-19	0 - 5	GW @ 4' bgs
	5 - 7	Gravel
	7 - 10	Weathered bedrock, gravel
	20 - 22	Log note - no recovery
	22 - 24	Bedrock (probably a boulder)
	>28	Bedrock

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
PDI-20	0 - 5	GW @ 2.5' bgs
	5 - 20	Very loose/saturated - sinking casing, weight of rod blow counts
	>20	Bedrock
PDI-21	0 - 5	GW @ 5' bgs
	10 - 15	No recovery, possible obstruction
PDI-21	30 - 35	Brick and mortar
	35 - 40	Concrete
	>40	Bedrock
PDI-22	0 - 5	GW @ 2.5' bgs
	10 - 11	Weathered bedrock
	20 - 23	Wood
	25 - 27	Concrete
	>30	Bedrock
PDI-23	4 - 5	Gravel/Cobble/Brick/Wood; GW @ 5' bgs
	10 - 16	Mostly bedrock fragments; some wood/concrete
	>20	Bedrock
PDI-24/MW-21	7 - 10	Gravel
	10 - 15	No recovery, possible obstruction
	25 - 26	Pounded case to advance bit
	26	Concrete
	>26	Bedrock
		Artesian conditions once casing removed.
PDI-25	0 - 5	GW @ 4.5' bgs
	6 - 7	Gravel
	11 - 12	Brick and mortar
	19 - 25	Roller bit used
	>25	Bedrock
PDI-26	0 - 5	GW @ 4' bgs
	>12	Weathered bedrock, brick and mortar, wood
		Artesian conditions present, prior to bedrock coring.
PDI-27	0 - 5	GW @ 5' bgs
	16 - 18	No recovery, possible obstruction
	20 - 25	Gravel
	>37	Bedrock
PDI-28	2 - 5	Cobble/brick/metal; GW @ 5' bgs.
	7 -10	Sonic sampler refusal; Rock from 8 - 10
	>10	Bedrock

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
PDI-29	0 - 5	GW @ 2.5' bgs
	5 - 7	Brick and debris
	10 - 12	Weathered bedrock
	13 - 20	Concrete
	>38	Bedrock
PDI-30	0 - 5	GW @ 3.25' bgs
	8 - 9	Concrete
	14 - 30	Mostly weathered bedrock
	>30	Bedrock
PDI-31	0 - 5	Sand/gravel/cobble; GW @ 5' bgs
	10 - 15	Weathered bedrock
PDI-31	>15	Bedrock
PDI-32	0 - 5	GW @ 5' bgs
	>15	Bedrock
PDI-33	0 - 5	Gravel/Cobble/Concrete debris; GW @ 4' bgs
	6 - 11	Mostly weathered bedrock and brick
	22 - 30	Weathered Bedrock
	>30	Bedrock
PDI-34	0 - 5	GW @ 5' bgs
	7 - 11	Sonic sampler refusal; Rock from 7 - 11
	>11	Bedrock
CONT-1	0 - 5	Sand/Gravel/Wire/Metal; GW @ 5' bgs
	10 - 12	Weathered bedrock
	14 - 17	Concrete and brick
	>30	Bedrock
CONT-2	0 - 5	Cobble; GW @ 2' bgs
	10 - 12	Concrete
	25 - 28	Weathered bedrock
	>30	Bedrock
CONT-3	0 - 5	Some cobble/brick; FW @ 5' bgs
	11 - 14	Weathered bedrock
	22 - 24	Concrete
	>25	Weathered bedrock/bedrock
CONT-4	0 - 5	Bedrock boulders; GW @ 5' bgs
	>8	Bedrock
CONT-5	0 - 5	GW @ 5' bgs
	6 - 10	Weathered bedrock
	10 - 12	Concrete
	>16	Bedrock
		Well grouted - GW flowing to surface once casing removed.

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
CONT-6	Multiple failed hand clear attempts due to rock and rapid groundwater intrusion.	
CONT-7	0 - 5	Cobble; GW @2.5' - rose to 0.5' bgs upon clearance
	5 - 7	Weathered bedrock
	10 - 12	Concrete, weathered bedrock
	>15	Bedrock
		Artesian conditions once case removed.
CONT-8	0 - 5	Sand/Gravel; GW @ 5' bgs
	14 - 15	Concrete, wood/brick
	>26	Bedrock
MW-24	11 - 12	Brick
	13 - 14	Weathered bedrock
PW-1	10 - 11	Concrete
	11 - 13	Brick and mortar
PW-1	13 - 14	Log note - difficult drilling
PW-2	5 - 7	Wood/Brick debris
	16 - 19	Brick and mortar
	20 - 40	Brick
	40 - 44	Concrete
	>44	Weathered bedrock and bedrock
TP-9	2.5	Tar pump foundation
	3	Rapid GW intrusion

SITE CHARACTERIZATION ACTIVITIES		
SB-3	>10	Bedrock
SB-5	17	Concrete
	>17	Weathered bedrock
SB-6	0 - 5	GW @ 3.5' bgs
	7	Auger refusal
SB-7	6	Weathered bedrock
	7	Auger refusal
SB-8	0 - 5	GW @ 5' bgs
	14	Weathered bedrock
	36	Auger refusal
SB-9	0 - 5	GW @ 5' bgs
	>13	Bedrock
SB-10	0 - 5	GW @ 5' bgs
	5.5	Weathered bedrock
	15 - 23	Void space
	23	Cement
	36.5	Auger refusal

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
SB-11	6	GW @ 6' bgs
	25	Auger refusal
SB-12	6	Brick/debris
	20	Auger refusal
SB-13	5	Weathered bedrock; GW @ 5' bgs
	7	Brick
	12	Cement
	14	Auger refusal
SB-15	14	Brick/Cement
		Log note - Hard material 8 - 15, possible holder wall.
SB-16	10 - 12	Cement
	>12	Bedrock
SB-17	8.5 - 9.5	Bedrock boulder, auger refusal
	24 - 26	Bedrock fragments
	26 - 31	Void space
SB-18	0 - 5	GW @ 4' bgs
SB-18	5 - 6	Brick/rock fragments
	10 -16	Brick; weathered bedrock
	>25	Bedrock
SB-19	6	GW @ 6' bgs
	34	Concrete
	>36	Bedrock
SB-20	0 - 5	GW @ 3' bgs
	5 - 8	Bedrock boulder
	35	Concrete; auger refusal
SB-21	8	GW @ 8' bgs
	>21	Bedrock
SB-22	8	GW @ 8' bgs
	25	Concrete; auger refusal
SB-23	8	Wood debris
	9	GW @ 9' bgs
	25	Concrete; auger refusal
		First and second attempts met refusal at 6 and 13'
SB-24	0 - 5	GW @ 4' bgs
	6	Weathered bedrock; auger refusal
MW-1	5	GW @ 5' bgs
	5 - 37	Typical fill materials
MW-2	0 - 5	GW above 5' bgs
	15	Typical fill material to 15'
MW-3	0 - 5	GW @ 5' bgs
	23	Gravel
	39	Cement

Table 14
Summary of Subsurface Obstructions
Former West 45th Street Gas Works Site - OU-2
Alternatives Analysis Report

Location	Depth	Possible Obstruction
MW-4	0 - 5	GW @ 5' bgs
MW-5	0 - 5	GW @ 5' bgs
MW-6	0 - 5	GW @ 5' bgs
TP-1	<1	Large rocks in fill
TP-2	0 - 2	Tar tank wall along southern edge of pit
TP-3/TP-4	0 - 1	Large wood and broken brick debris; tar tank wall at north end of pit
TP-5	0 - 4	Tar pump adjacent to test pit at surface
TP-6	0 - 1	Concrete blocks
	2 - 4	Skimmer pump and gasholder on northeast wall of pit
TP-8	0 - 2	Large gasolder wall on NE, small gasholder wall on SW
TP-11	0 - 2	Large concrete blocks; small gasholder brick wall in center
TP-12	2	Stopped @ 2' bgs due to rock obstruction
TP-13	3	Concrete ledge
TP-14	0 - 2	Small gasholder wall oriented east-west in center of pit
TP-15	3	Exposed building foundation

FIGURES

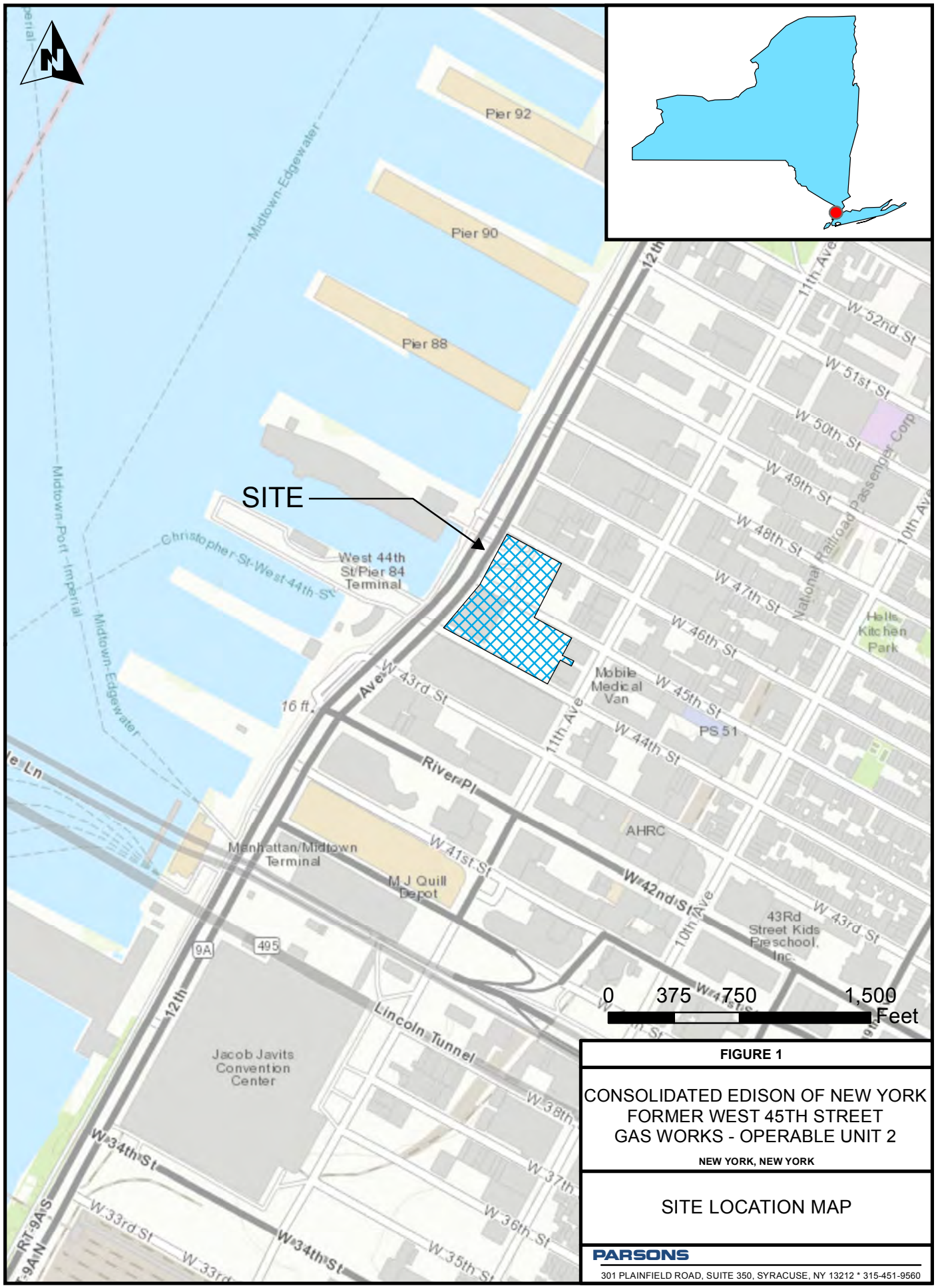


FIGURE 1

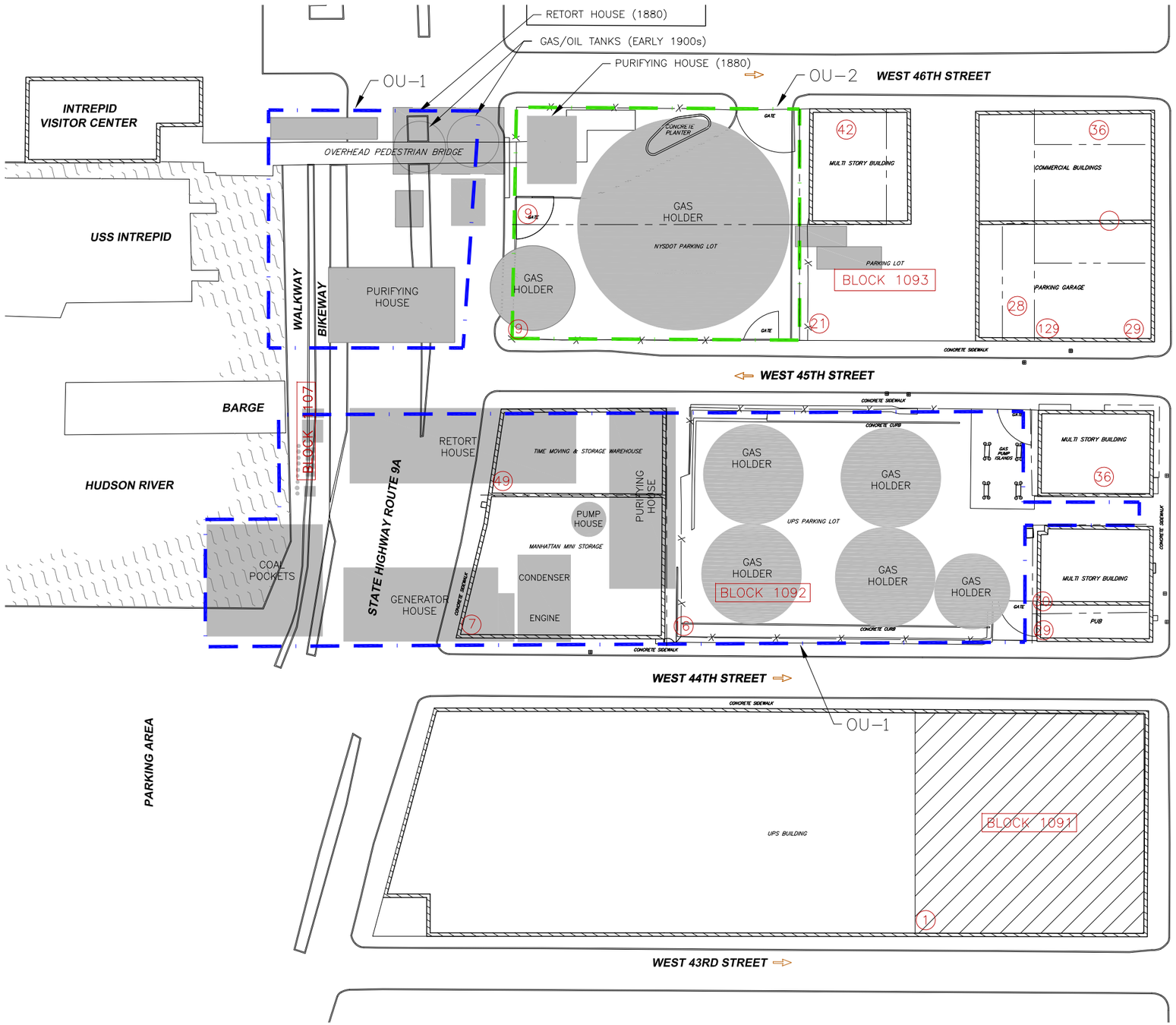
CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45TH STREET
GAS WORKS - OPERABLE UNIT 2

NEW YORK, NEW YORK

SITE LOCATION MAP

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

FILE NAME: P:\ConEd\450089 - W45th OU-2 AAR 2016\ENGR\OU2\Figure 1 Site Location.mxd
DATE: 10/4/2016 CREATED BY: S. Liberatore



LEGEND:

- CURRENT FEATURES
- HISTORICAL FEATURES (LOCATIONS ARE APPROXIMATE)
- EXISTING BUILDING
- CHAIN LINK FENCE
- LIMITS OF OU–1
- LIMITS OF OU–2
- BLOCK 1093 — TAX BLOCK NUMBER
- 21 — TAX LOT NUMBER FOR PARCELS WITHIN FORMER MGP
- TAX LOT BOUNDARIES
- APPROXIMATE EXTENT OF UPS PARKING GARAGE

100 50 0 100 200

SCALE: 1"=100'

FIGURE 2

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

OPERABLE UNIT MAP AND FORMER MGP STRUCTURES

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732–537–3500

FILE NAME: P:\CONED\450089 – W45TH OU–2 AAR 2016\ENGR\AAR–FIGURES\450089–AAR–SK001.DWG
PLOT DATE: 10/7/2016 11:23 AM PLOTTED BY: RUSSO, JILL

WEST 46th STREET
(TRAFFIC FLOW ⇒)

CONCRETE SIDEWALK
STEEL FACED CURB
STEEL FACED CURB
CONCRETE SIDEWALK
GATE
CHAIN LINK FENCE
SLIDING GATE
CONCRETE RAMP
CONCRETE RAMP
OVERHEAD DECK
CHAIN LINK FENCE
STAIRS
OVERHEAD CANOPY
WAGON SHED (PURIFYING HOUSE)
GAS OIL TANK
OVERHEAD PEDESTRIAN BRIDGE
OVERHEAD DECK
CONCRETE PLANTER
ASPHALT PARKING LOT
CONCRETE
SHED
SLIDING GATE
CONCRETE SIDEWALK
GRANITE CURB
GAS HOLDER
GAS HOLDER
APPROXIMATE LOCATION OF BURIED BRICK WALL
CHAIN LINK FENCE
SLIDING GATE
CHAIN LINK FENCE
CONCRETE SIDEWALK
CONCRETE SIDEWALK
TRENCH DRAIN

MW-19
PDI-32
MW-1
SG-1
PW-2
SG-2
PDI-2
PDI-3
SB-3
PDI-1
MW-22
PDI-5
TP-1
SB-5
SB-6
PDI-4
TP-2
SB-7
PDI-6
PDI-33
CONCRETE
CONT-1
PDI-7
MW-3
MW-3
PDI-34
MW-2
MW-2
CONT-7
TP-10
CONT-2
SG-3
TP-15
SB-10
PDI-9
SB-9
SB-12
PDI-10
TP-PDI9
PDI-28
PDI-27
SB-11
TP-14
TP-8
PDI-11
TP-3, 4
PUR-1
PDI-26
PDI-30
CONT-5
MW-24
PDI-29
SB-16
PDI-22
SB-13
SB-8
PDI-21
PW-1
CONT-8
SB-15
CONT-3
PDI-12
PDI-13
SB-17
MW-4
MW-5
MW-4
MW-5
PDI-18/
MW-23
TP-5
PDI-25
PDI-19
PDI-16
MW-6
MW-6
PDI-23
SB-18
TP-6
SB-19
SB-20
SB-21
PDI-15
CONT-4
SB-22
PDI-24
MW-21
TP-13
PDI-20
SB-24
PDI-17
TP-11
SB-23
TP-12
PDI-31
TAR DRIP

12th AVENUE – STATE HIGHWAY 9A (TRAFFIC FLOW ⇒)

(TRAFFIC FLOW ⇐) WEST 45th STREET

LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- PREVIOUS SOIL GAS SAMPLE LOCATION
- PREVIOUS GRAB SOIL SAMPLE
- EXISTING PUMPING WELL
- TEST PIT LOCATION

30 15 0 30 60

SCALE: 1"=30'

FIGURE 3

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SITE SAMPLE LOCATIONS

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

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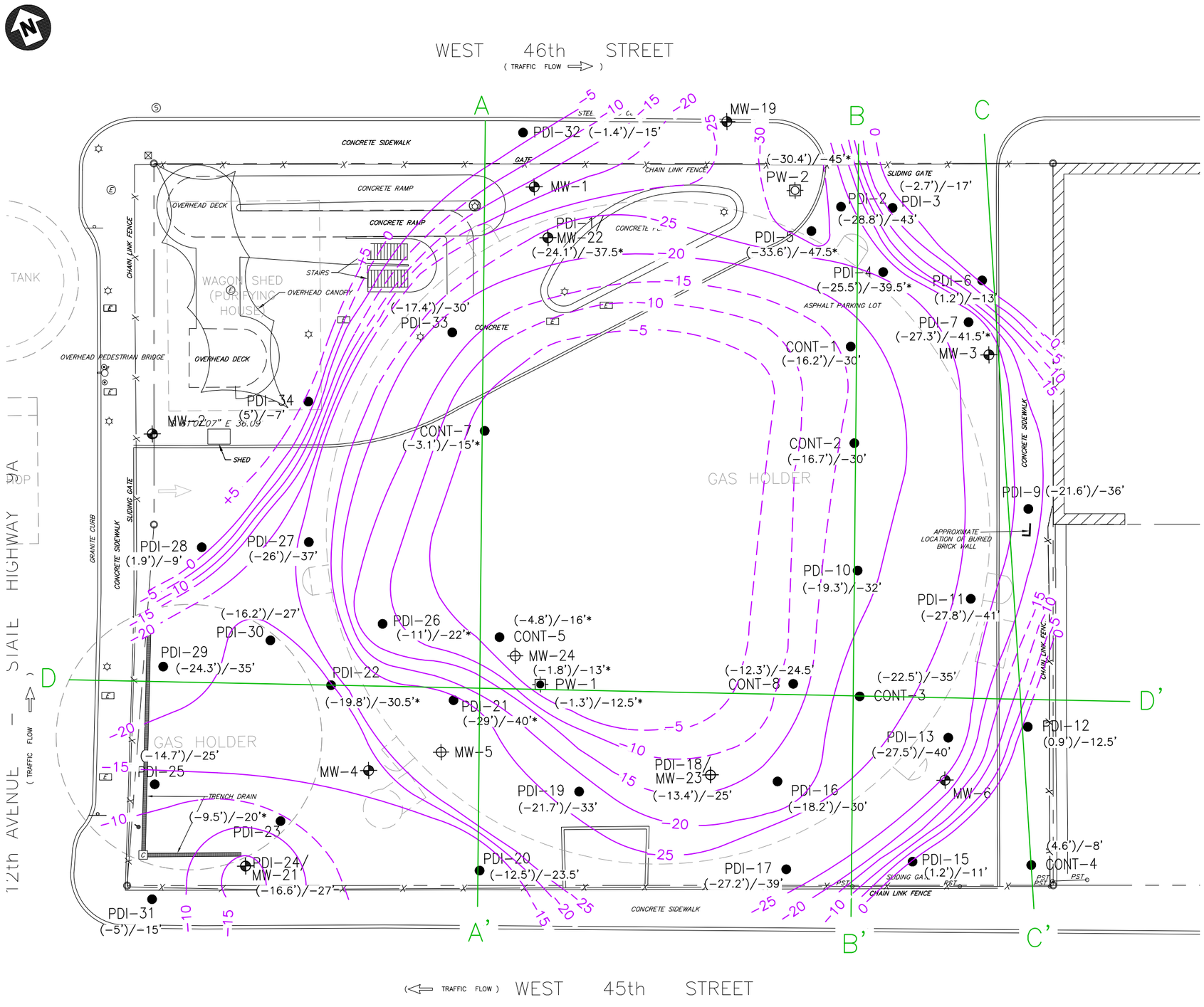


LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- (-27.3')/-41.5' (BEDROCK ELEVATION)/DEPTH RELATIVE TO GROUND SURFACE (NAVD88)
- * NX CORE WAS NOT COLLECTED AT THIS LOCATION BECAUSE OF DRILLING ISSUES (e.g., ARTESIAN CONDITIONS, PRESENCE OF DEBRIS) OR PROXIMITY TO A LOCATION WHERE A NX CORE WAS TAKEN
- BEDROCK ELEVATION CONTOURS (DASHED WHERE INFERRED)
- CROSS SECTION LOCATION

NOTES:

1. GROUND SURFACE ELEVATIONS RANGE FROM 10 FT TO 14.6 FT (NAVD88) ACROSS THE SITE.

30 15 0 30 60

SCALE: 1"=30'

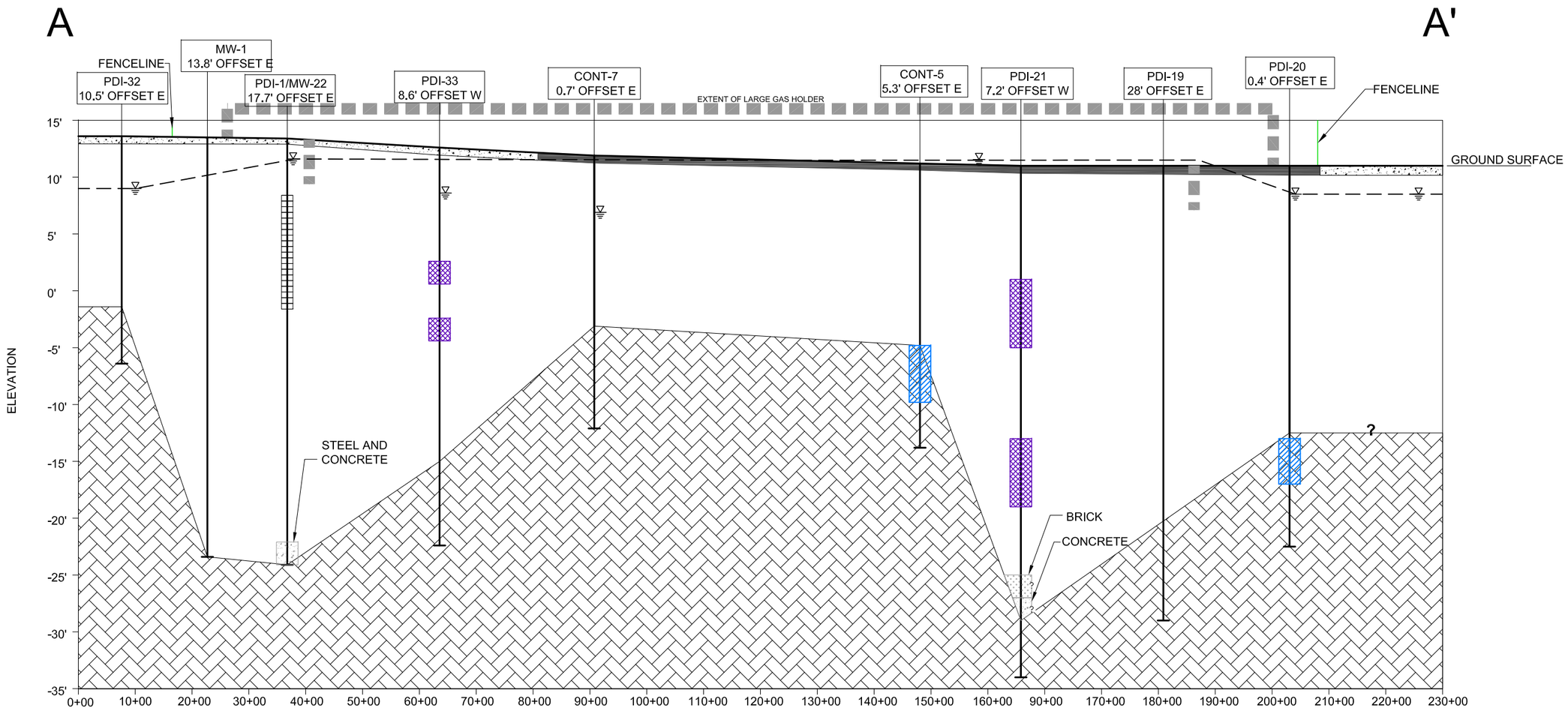
FIGURE 4

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

BEDROCK ELEVATIONS

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK003.DWG
PLOT DATE: 10/5/2016 11:21 AM PLOTTED BY: RUSSO, JILL



CONCRETE

ASPHALT

BEDROCK

VISIBLE NAPL IN SOIL SAMPLE

VISIBLE NAPL IN WASH WATER

? BEDROCK DEPTH ESTIMATED FROM FIELD OBSERVATIONS WITHOUT BEDROCK CORE

ESTIMATED POTENTIOMETRIC SURFACE ELEVATION

MONITORING WELL SCREEN INTERVAL

SOIL BORING

FORMER HOLDER WALL LOCATION (APPROX)

20 10 0 20 40

SCALE: 1"=20'

HORIZONTAL SCALE

10 5 0 10 20

SCALE: 1"=10'

VERTICAL SCALE

NOTES:

1. ELEVATIONS ARE BASED ON NAVD88.
2. NO HATCHING BELOW GROUND SURFACE INDICATES FILL MATERIALS, WHICH INCLUDE SAND, GRAVEL, COBBLES, WEATHERED GNEISSIC SCHIST, AND DEBRIS (BRICK, CONCRETE, WOOD, METAL).
3. BEDROCK ELEVATIONS BASED ON BORING LOGS AND CONTOURS SHOWN ON FIGURE 3.
4. GROUNDWATER ELEVATIONS BASED ON CONTOURS SHOWN ON FIGURE 8.

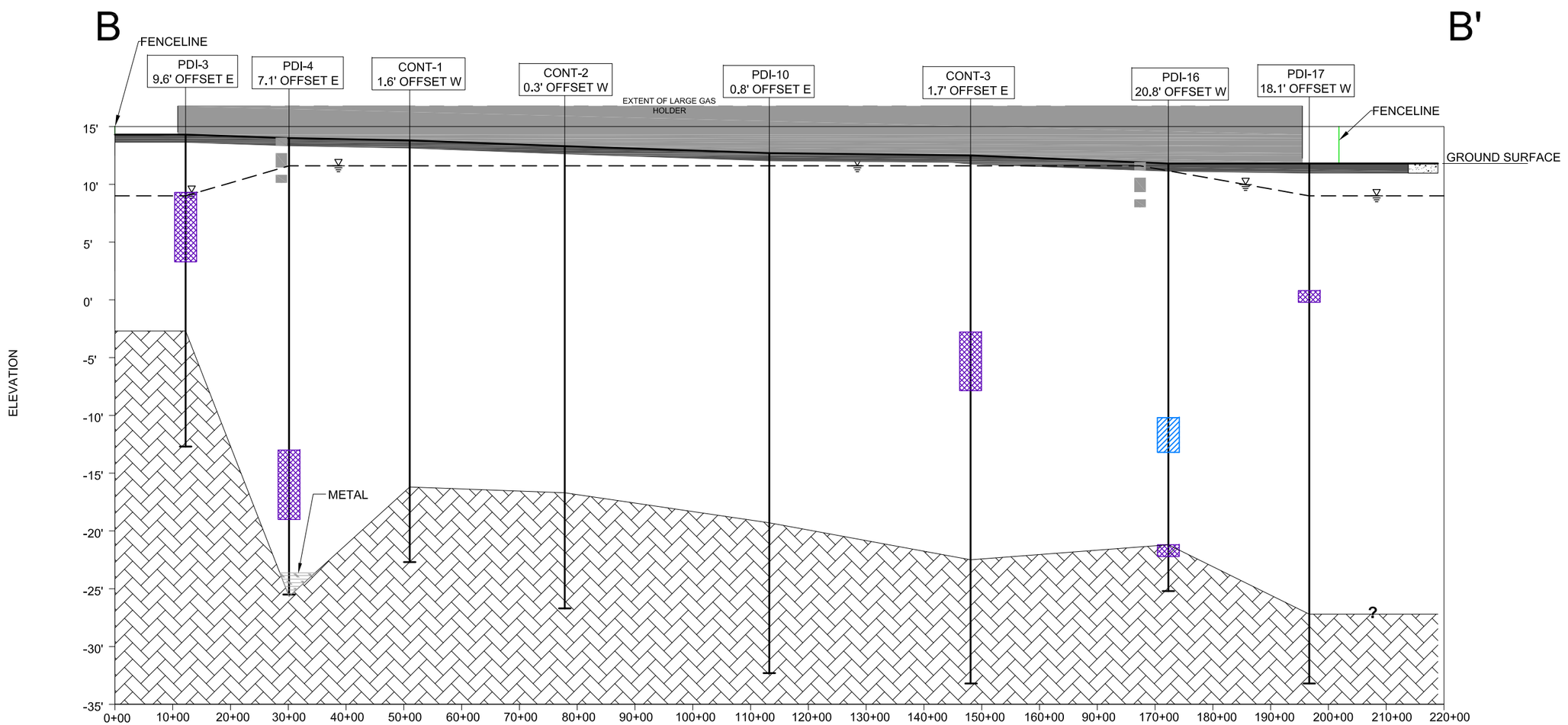
FILE NAME: P:\CONED\450089 - W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK004.DWG
PLOT DATE: 10/7/2016 9:19 AM PLOTTED BY: RUSSO, JILL

FIGURE 5

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS - OU2
NEW YORK, NEW YORK

CROSS SECTION A-A'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500



CONCRETE

ASPHALT

BEDROCK

VISIBLE NAPL IN SOIL SAMPLE

VISIBLE NAPL IN WASH WATER

? BEDROCK DEPTH ESTIMATED FROM FIELD OBSERVATIONS WITHOUT BEDROCK CORE

ESTIMATED POTENTIOMETRIC SURFACE ELEVATION

MONITORING WELL SCREEN INTERVAL

SOIL BORING

FORMER HOLDER WALL LOCATION (APPROX)

20 10 0 20 40

SCALE: 1"=20'

HORIZONTAL SCALE

10 5 0 10 20

SCALE: 1"=10'

VERTICAL SCALE

NOTES:

1. ELEVATIONS ARE BASED ON NAVD88.
2. NO HATCHING BELOW GROUND SURFACE INDICATES FILL MATERIALS, WHICH INCLUDE SAND, GRAVEL, COBBLES, WEATHERED GNEISSIC SCHIST, AND DEBRIS (BRICK, CONCRETE, WOOD, METAL).
3. BEDROCK ELEVATIONS BASED ON BORING LOGS AND CONTOURS SHOWN ON FIGURE 3.
4. GROUNDWATER ELEVATIONS BASED ON CONTOURS SHOWN ON FIGURE 8.

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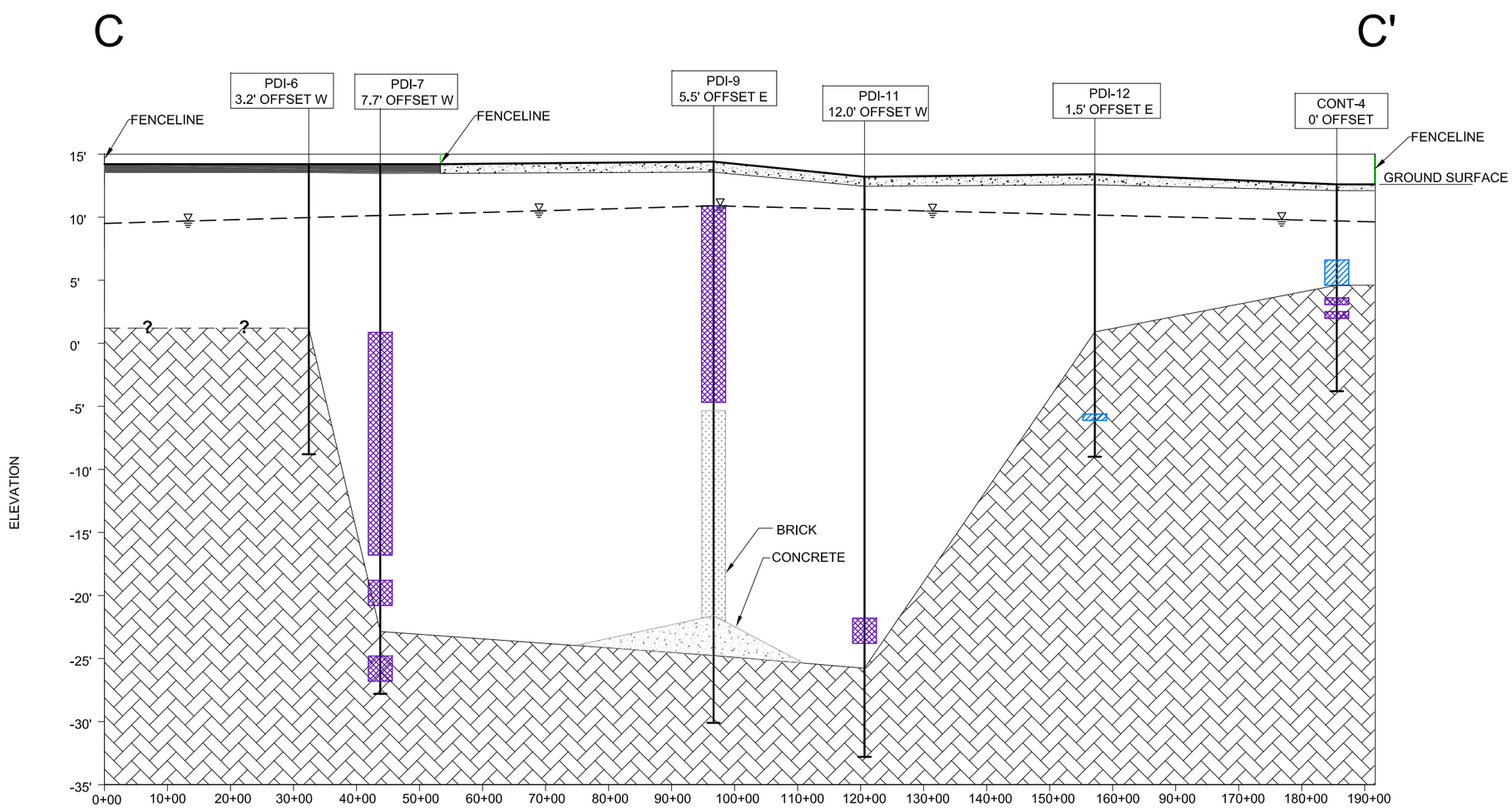
FIGURE 6

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

CROSS SECTION B–B'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500



CONCRETE

ASPHALT

BEDROCK

VISIBLE NAPL IN SOIL SAMPLE

VISIBLE NAPL IN WASH WATER

? BEDROCK DEPTH ESTIMATED FROM FIELD OBSERVATIONS WITHOUT BEDROCK CORE

ESTIMATED POTENTIOMETRIC SURFACE ELEVATION

MONITORING WELL SCREEN INTERVAL

SOIL BORING

FORMER HOLDER WALL LOCATION (APPROX)

20 10 0 20 40

SCALE: 1"=20'

HORIZONTAL SCALE

10 5 0 10 20

SCALE: 1"=10'

VERTICAL SCALE

NOTES:

1. ELEVATIONS ARE BASED ON NAVD88.
2. NO HATCHING BELOW GROUND SURFACE INDICATES FILL MATERIALS, WHICH INCLUDE SAND, GRAVEL, COBBLES, WEATHERED GNEISSIC SCHIST, AND DEBRIS (BRICK, CONCRETE, WOOD, METAL).
3. BEDROCK ELEVATIONS BASED ON BORING LOGS AND CONTOURS SHOWN ON FIGURE 3.
4. GROUNDWATER ELEVATIONS BASED ON CONTOURS SHOWN ON FIGURE 8.

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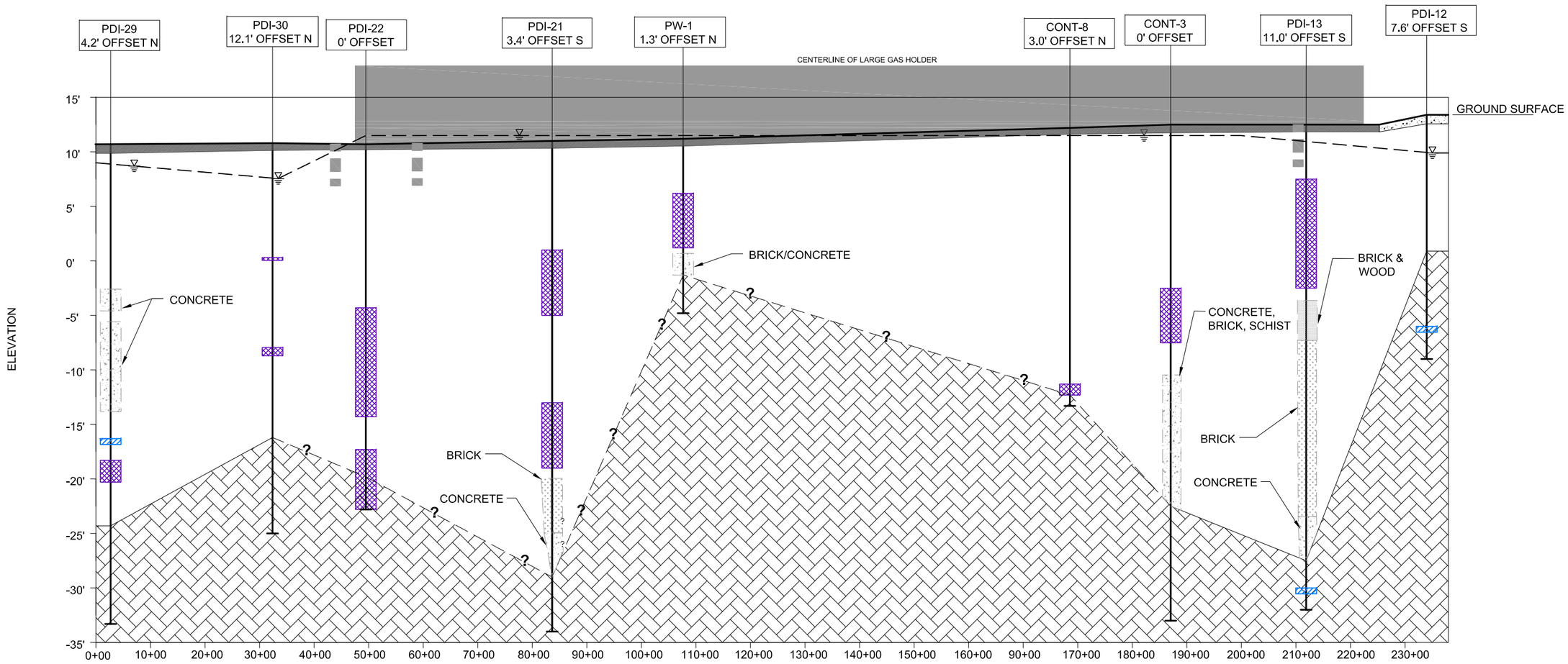
FIGURE 7

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS - OU2
NEW YORK, NEW YORK

CROSS SECTION C-C'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500



CONCRETE

ASPHALT

BEDROCK

VISIBLE NAPL IN SOIL SAMPLE

VISIBLE NAPL IN WASH WATER

? BEDROCK DEPTH ESTIMATED FROM FIELD OBSERVATIONS WITHOUT BEDROCK CORE

ESTIMATED POTENTIOMETRIC SURFACE ELEVATION

MONITORING WELL SCREEN INTERVAL

SOIL BORING

FORMER HOLDER WALL LOCATION (APPROX)

20 10 0 20 40

SCALE: 1"=20'

HORIZONTAL SCALE

10 5 0 10 20

SCALE: 1"=10'

VERTICAL SCALE

NOTES:

1. ELEVATIONS ARE BASED ON NAVD88.
2. NO HATCHING BELOW GROUND SURFACE INDICATES FILL MATERIALS, WHICH INCLUDE SAND, GRAVEL, COBBLES, WEATHERED GNEISSIC SCHIST, AND DEBRIS (BRICK, CONCRETE, WOOD, METAL).
3. BEDROCK ELEVATIONS BASED ON BORING LOGS AND CONTOURS SHOWN ON FIGURE 3.
4. GROUNDWATER ELEVATIONS BASED ON CONTOURS SHOWN ON FIGURE 8.

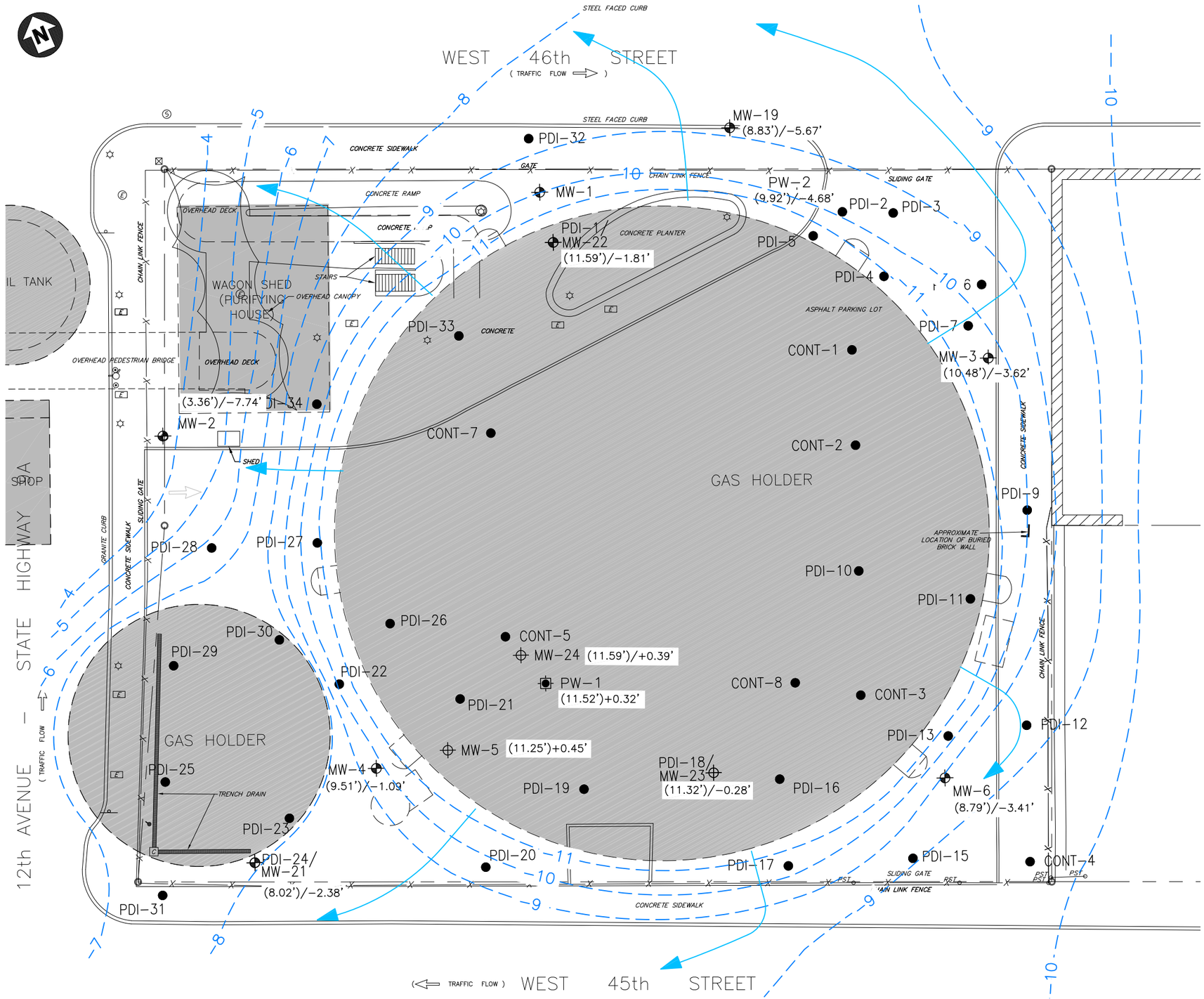
FILE NAME: P:\CONED\450089 - W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK004.DWG
PLOT DATE: 10/7/2016 9:19 AM PLOTTED BY: RUSSO, JILL

FIGURE 8

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS - OU2
NEW YORK, NEW YORK

CROSS SECTION D-D'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500



LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- (11.32')/–0.28' (GROUNDWATER ELEVATION)/DEPTH RELATIVE TO GROUND SURFACE
- INFERRED GROUNDWATER ELEVATION CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION

NOTES:

1. GROUND SURFACE ELEVATIONS RANGE FROM 10 FT TO 14.6 FT (NAVD88) ACROSS THE SITE.
2. GROUNDWATER ELEVATIONS REPRESENT AVERAGE VALUES OBSERVED DURING THE PRE–DESIGN INVESTIGATION FROM MARCH TO JULY IN 2012.

30 15 0 30 60

SCALE: 1"=30'

FIGURE 9

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

2012 GROUNDWATER ELEVATIONS

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732–537–3500

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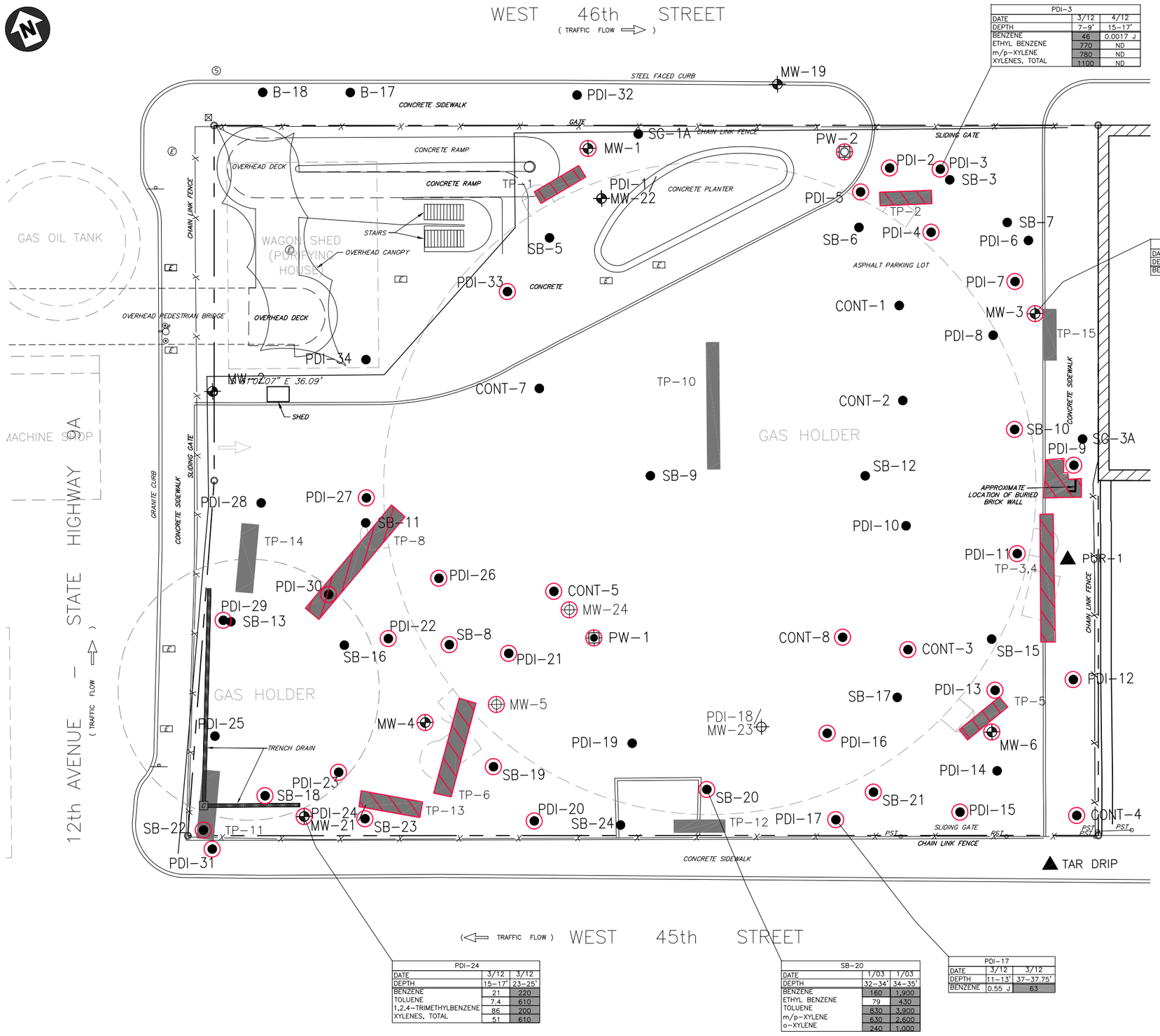

LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- TEST PIT
- TEST PIT WITH AREA OF VISIBLE NAPL
- AREA OF VISIBLE NAPL (IN BORINGS OR MONITORING WELLS)
- ABANDONED MONITORING WELL (MW-24, MW-5, AND PDI-18/MW-23)
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL

VOCs	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives
BENZENE	44
ETHYL BENZENE	390
TOLUENE	500
m/p-XYLENE	500
o-xYLENE	500
XYLENES, TOTAL	500
1,2,4-TRIMETHYLBENZENE	190

ALL CONCENTRATIONS ARE IN PARTS PER MILLION (mg/Kg)

1,1 SHADED VALUES EXCEED 6 NYCRR PART 375 COMMERCIAL USE SOIL CLEANUP OBJECTIVES

J ESTIMATE VALUE

N SPIKED SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS

NA NOT AVAILABLE

ND NOT DETECTED

30 15 0 30 60

SCALE: 1"=30'

FIGURE 10

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SUMMARY OF VOCs IN SUBSURFACE SOIL EXCEEDING CSCOs

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK006.DWG
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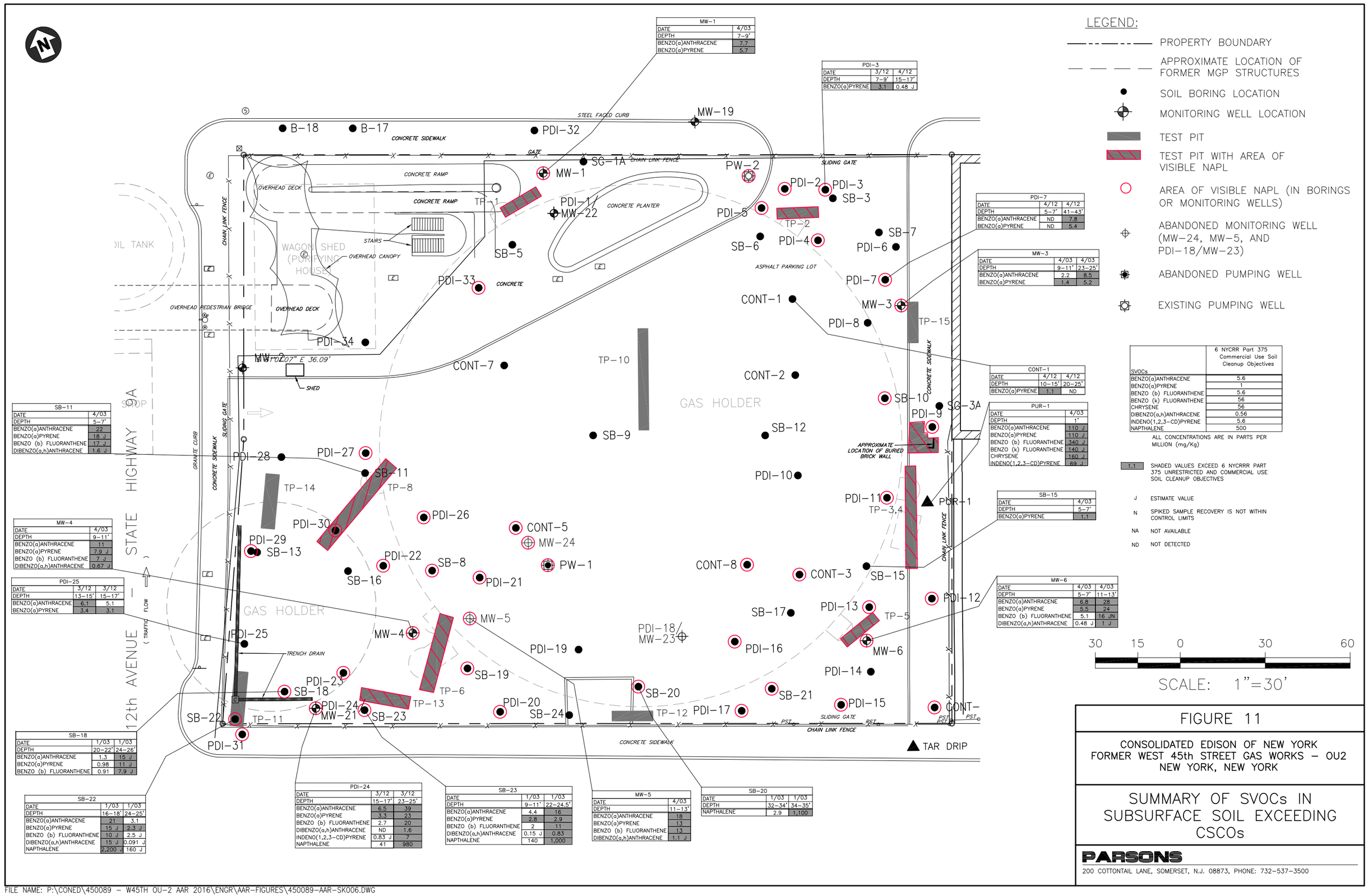

FIGURE 11

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SUMMARY OF SVOCs IN SUBSURFACE SOIL EXCEEDING CSCOs

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK006.DWG
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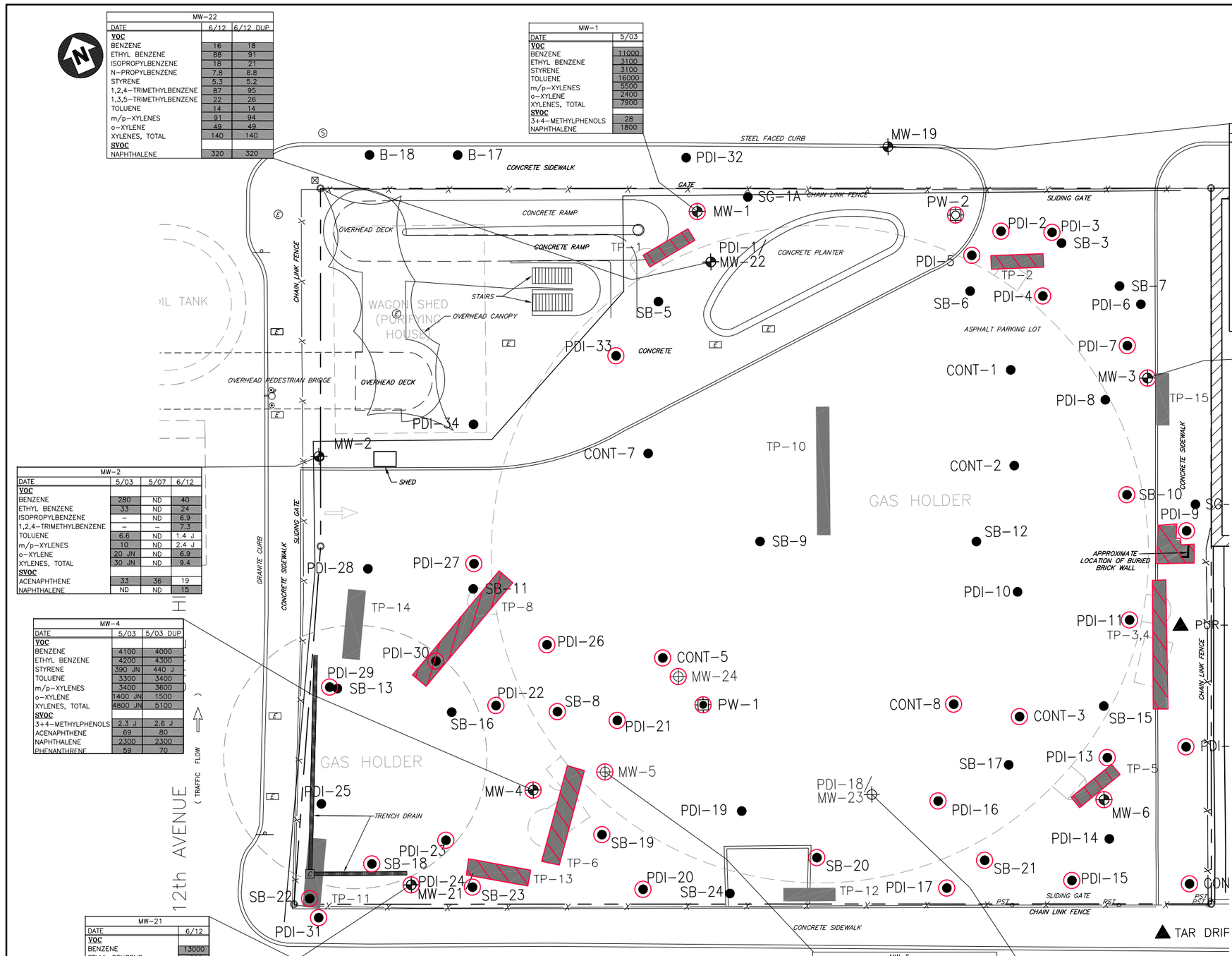


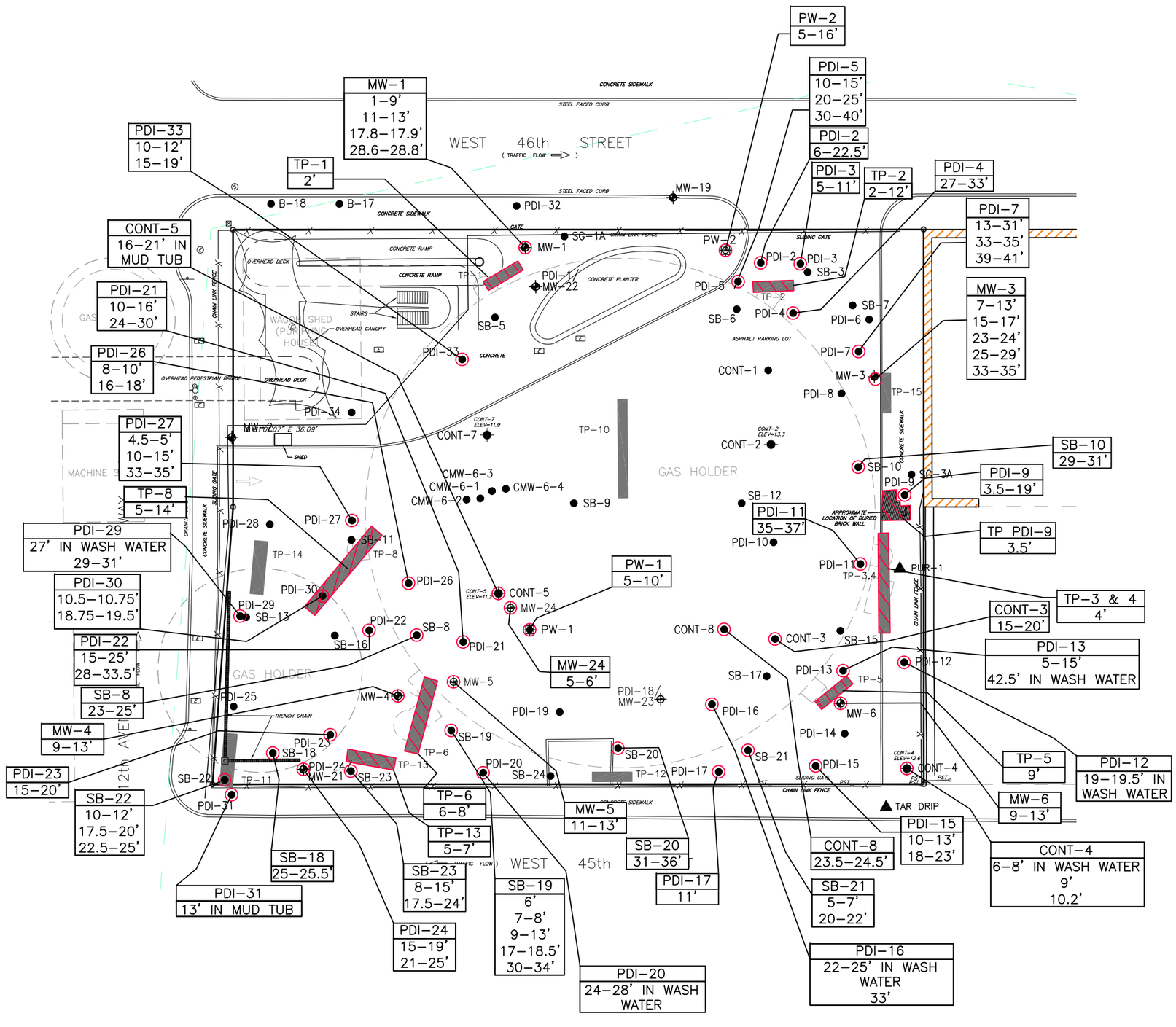
FIGURE 12

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SUMMARY OF VOCs AND SVOCs IN GROUNDWATER

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK006.DWG
PLOT DATE: 10/6/2016 4:57 PM PLOTTED BY: RUSSO, JILL



LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- TEST PIT
- TEST PIT WITH AREA OF VISIBLE NAPL
- AREA OF VISIBLE NAPL (IN BORINGS OR MONITORING WELLS)
- ABANDONED MONITORING WELL (MW–24, MW–5, AND PDI–18/MW–23)
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL

LOCATION ID
DEPTH (IN FEET) OF VISIBLE NAPL ON SOIL OR ROCK UNLESS OTHERWISE NOTED

NOTES:

1. BORINGS SB–1 THROUGH SB–24, TEST PITS TP–1 THROUGH TP–15, AND MONITORING WELLS MW–1 THROUGH MW–6 WERE INSTALLED DURING THE 2003 OU–2 SITE CHARACTERIZATION.
2. BORINGS PDI–1 THROUGH PDI–34, CONT–1 THROUGH CONT–5, CONT–7 AND CONT–8, MONITORING WELLS MW–21 THROUGH MW–24, AND PUMPING WELLS PW–1 AND PW–2 WERE INSTALLED DURING THE 2012 PDI.

40 20 0 40 80

SCALE: 1"=40'

FIGURE 13

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SUMMARY OF NAPL OBSERVATIONS

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732–537–3500

FILE NAME: P:\CONED\450089 – W45TH OU–2 AAR 2016\ENGR\AAR–FIGURES\450089–AAR–SK007.DWG
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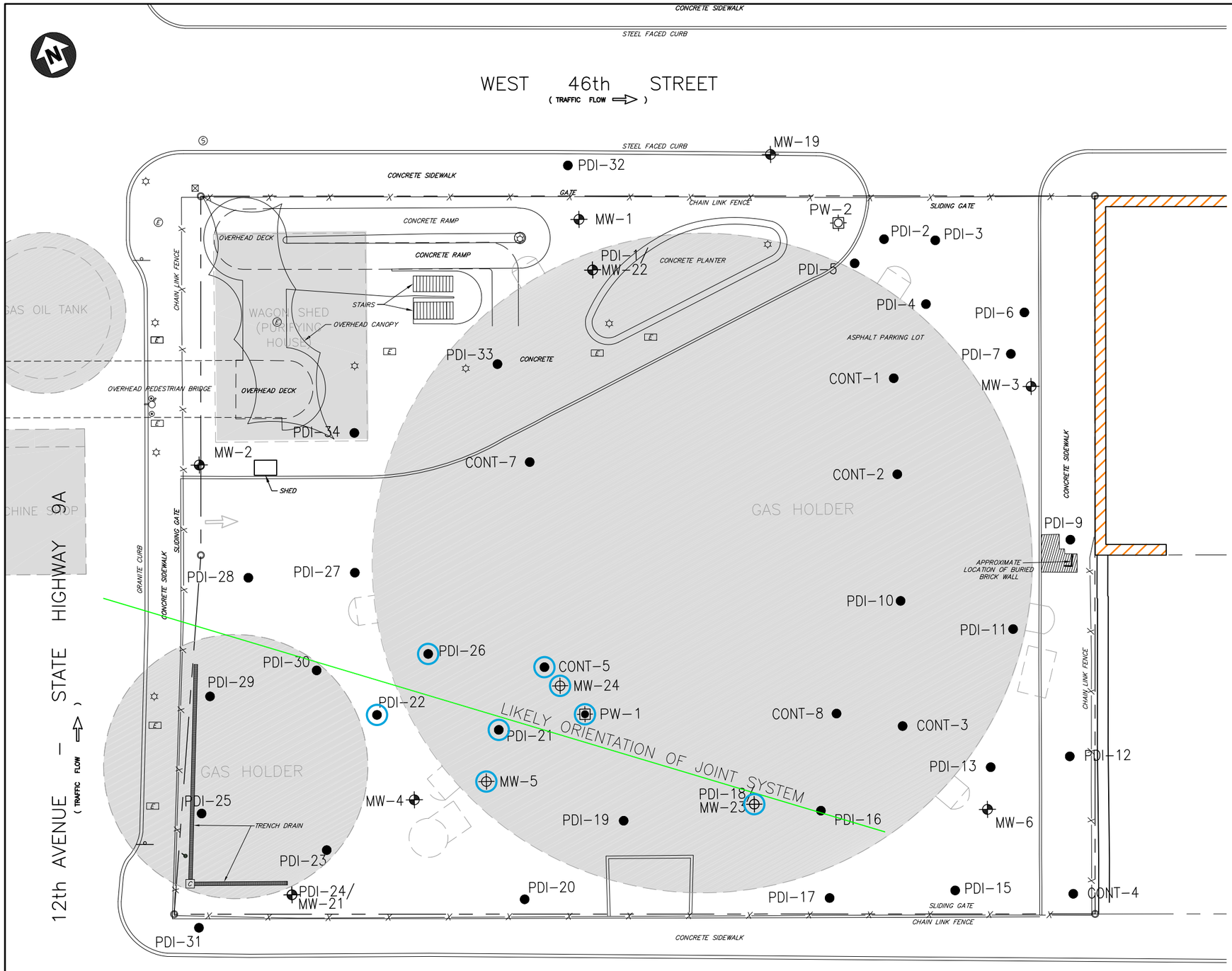


Rock exposure of Manhattan Schist showing distinct joint sets

REFERENCE: SNEE, C. 2009. GEOLOGY AND TUNNELING IN NEW YORK CITY. TBM: TUNNEL BUSINESS MAGAZINE SPECIAL SUPPLEMENT.

LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- TEST PIT LOCATION
- ARTESIAN CONDITIONS
- JOINT SYSTEM ORIENTATION

FIGURE 14

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

OBSERVED ARTESIAN CONDITIONS

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

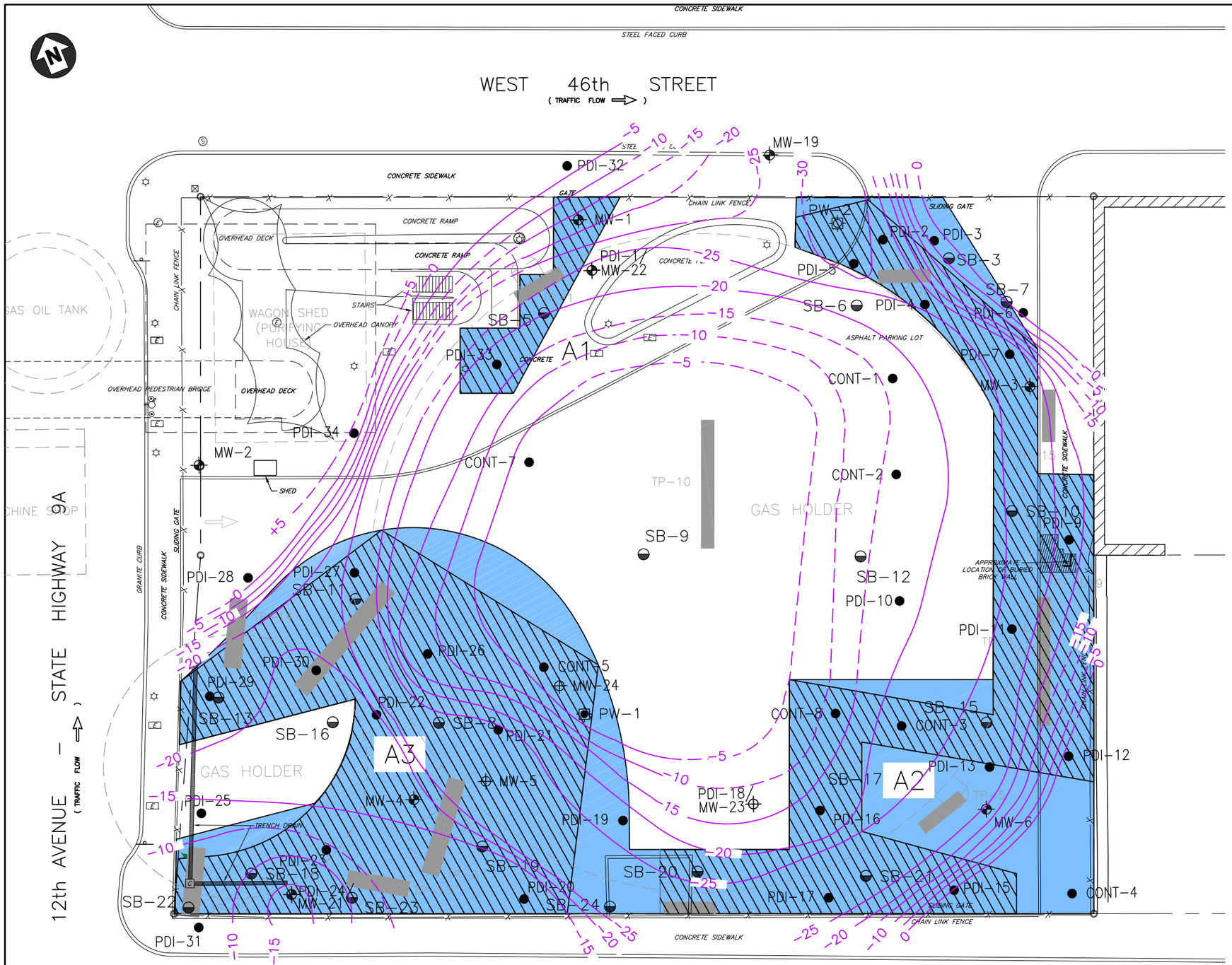
FILE NAME: P:\CONED\446672 – W45TH OU2\CAD\75% RD REPORT\FIGURES\446672-RD-SK007.DWG
PLOT DATE: 10/20/2016 10:29 AM PLOTTED BY: RUSSO, JILL

Figure 15
Qualitative Exposure Assessment
Former West 45th Street Gas Works - OU2
Alternative Analysis Report

Potential Sources	Impacted Media Constituents of Concern	Pathway Description	Potential Exposure Route	Potential Receptors (current/future)
Former MGP Operations	**Soils** VOCs and SVOCs	Excavation/grading for future development will expose impacted soils.	Direct dermal contact, ingestion, or inhalation (dust and volatilization).	The entire site is currently paved and half of site is fenced. Current receptors limited to visitors at the Site.
	Groundwater VOCs and SVOCs	Groundwater is not used as a source of potable water. Excavation/grading for future development may expose impacted groundwater.	Direct dermal contact or ingestion.	No current receptors. Future construction workers may be exposed to groundwater.
	Surface Water Temporary surface water on-site during wet conditions.	Excavation/grading for future development may require addressing surface water.	Direct dermal contact or ingestion.	Current receptors limited to construction and sampling personnel. Future construction workers may be exposed to surface water.
	Sediments No sediments are present onsite	Sediments are not present onsite, therefore no exposure pathway exists.	Sediments are not present onsite, therefore no exposure route exists.	Sediments are not present onsite, therefore there are no receptors.
	Air VOCs and SVOCs	Excavation/grading for future development may expose impacted soil. Potential release to air via volatilization.	Inhalation	No current receptors. Future construction workers may be exposed.
	NAPL MGP Coal Tar	Excavation/grading for future development may expose subsurface NAPL.	Direct dermal contact or ingestion.	No current receptors. Future construction workers may be exposed.

Current site use:
The entire site is paved. Remaining site is fenced and used for parking area and a pedestrian bridge

Future site use:
Commercial.



LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- TEST PIT LOCATION
- BEDROCK CONTOURS (DASHED IF INFERRED)
- EXCAVATION TO 15' BGS
- EXCAVATION TO 15' BGS AND ISS TO 30'

AREA	Area (sf)	EXCAVATION TO 15 FT BGS VOLUME (cy)	ISS 15-30 FT BGS VOLUME (cy)	TOTAL REMEDIATION VOLUME (cy)
AREA 1	820	900	600	1,500
AREA 2	9,910	5,500	5,100	10,600
AREA 3	10,520	5,800	4,300	10,100
TOTAL	21,250	12,200	10,000	22,200

30 15 0 30 60

SCALE: 1"=30'

FIGURE 16

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

ALTERNATIVE 1 – ESTIMATED REMEDIATION AREA EXCAVATE TO 15' AND ISS TO 30'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\EXCAVATIONS\450089-EXC-ALT 1.DWG
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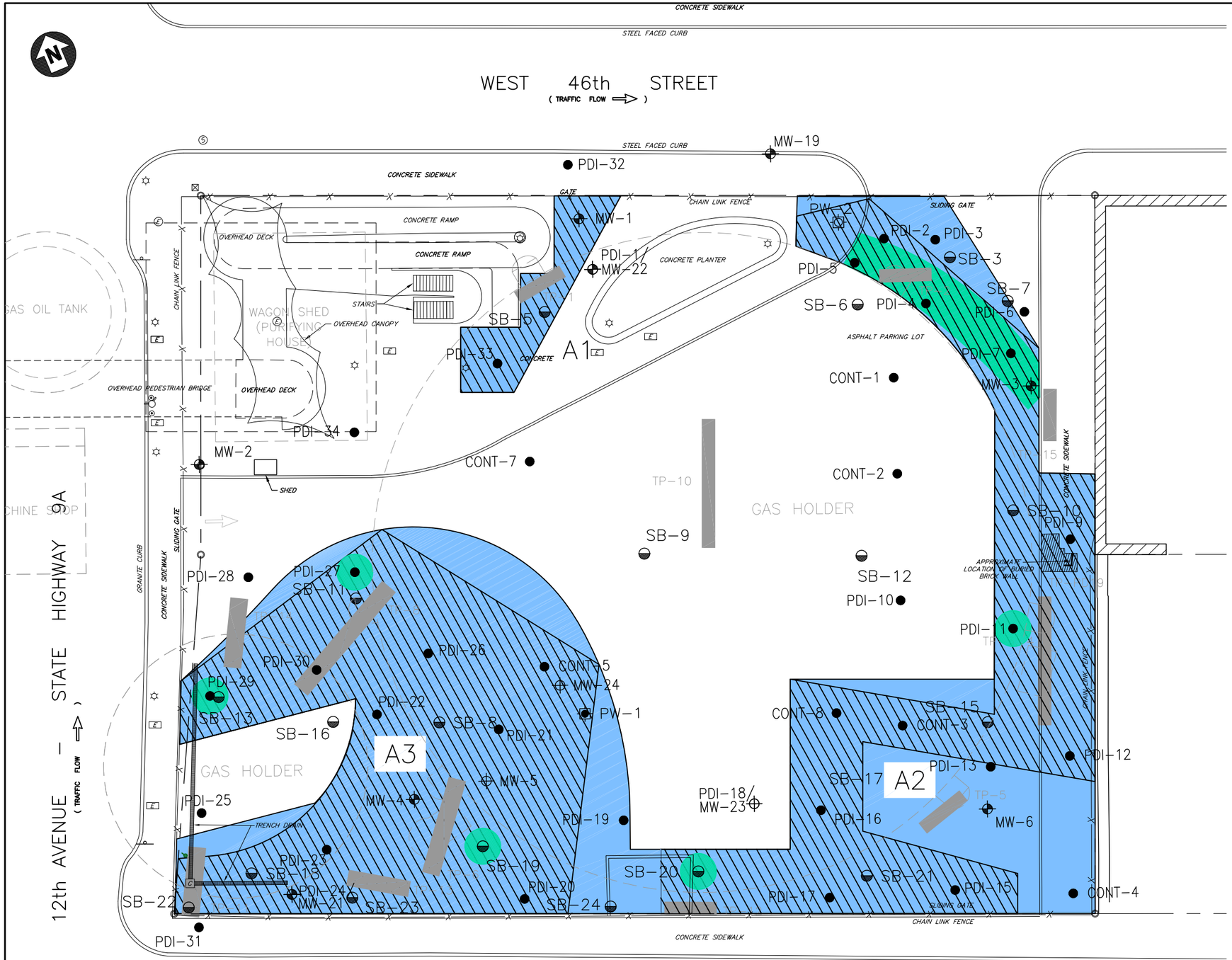


LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- TEST PIT LOCATION
- EXCAVATION TO 15' BGS
- EXCAVATION TO 15' BGS AND ISS TO 30'
- EXCAVATION TO 15' BGS AND ISS TO >30'

AREA	Area (sf)	EXCAVATION TO 15 FT BGS VOLUME (cy)	ISS 15-30 FT BGS VOLUME (cy)	ISS >30 FT BGS VOLUME (cy)	TOTAL REMEDIATION VOLUME (cy)
AREA 1	820	900	600	0	1,500
AREA 2	9,910	5,500	5,100	600	11,200
AREA 3	10,520	5,800	4,300	40	10,140
TOTAL	21,250	12,200	10,000	640	22,840

30 15 0 30 60

SCALE: 1"=30'

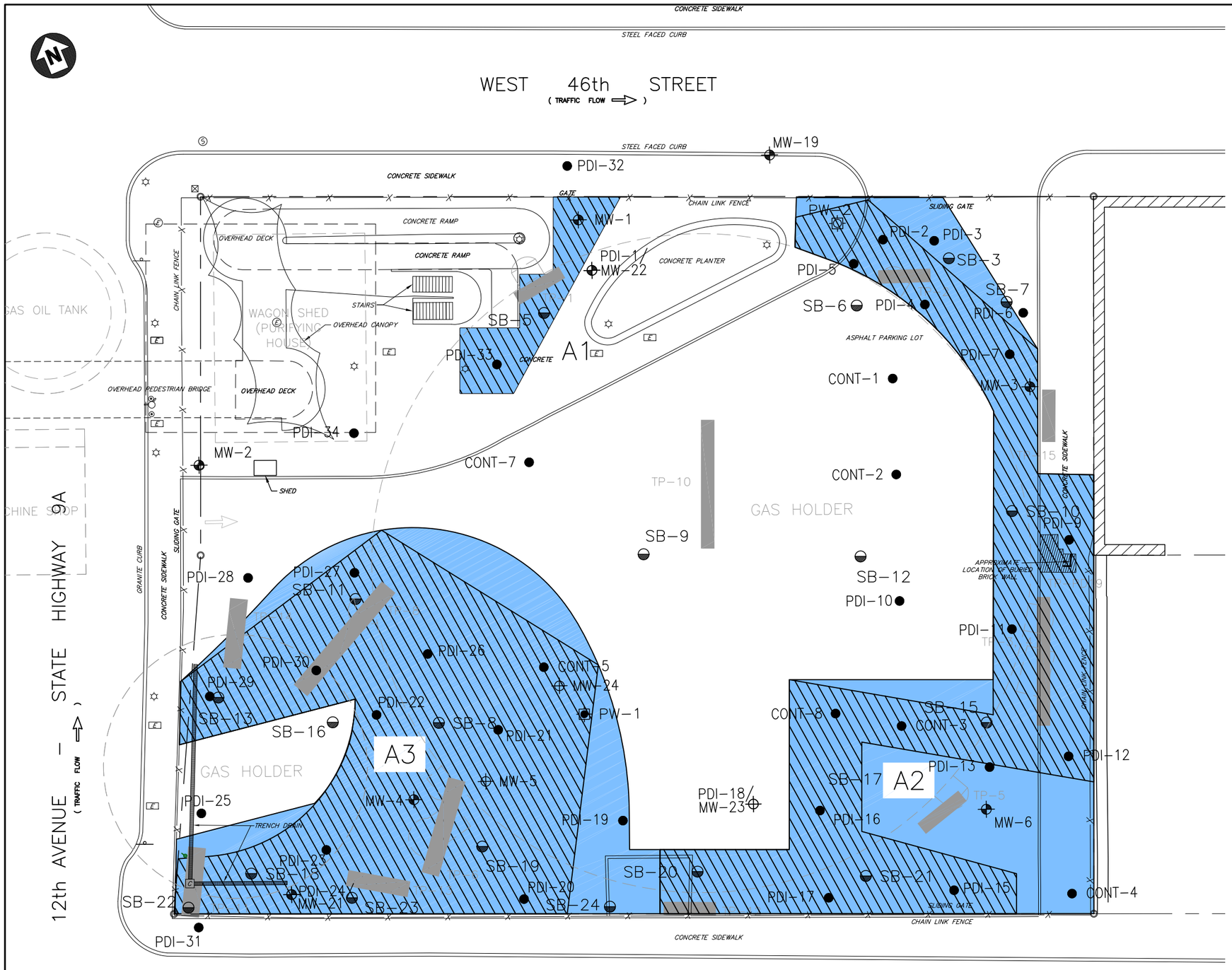
FIGURE 17

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

ALTERNATIVE 1A – ESTIMATED REMEDIATION AREA EXCAVATE TO 15' AND ISS TO >30'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\EXCAVATIONS\450089-EXC-ALT 1.DWG
PLOT DATE: 7/31/2017 1:26 PM PLOTTED BY: RUSSO, JILL



LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- TEST PIT LOCATION
- ISS TO 15'
- ISS TO 30'

AREA	Area (sf)	ISS TO 15 FT BGS VOLUME (cy)	ISS 15-30 FT BGS VOLUME (cy)	TOTAL REMEDIATION VOLUME (cy)
AREA 1	820	900	600	1,500
AREA 2	9,910	5,500	5,100	10,600
AREA 3	10,520	5,800	4,300	10,100
TOTAL	21,250	12,200	10,000	22,200

30 15 0 30 60

SCALE: 1"=30'

FIGURE 18

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

ALTERNATIVE 2 – ESTIMATED REMEDIATION AREA ISS TO 30'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\EXCAVATIONS\450089-EXC-ALT 2.DWG
PLOT DATE: 7/31/2017 10:19 AM PLOTTED BY: RUSSO, JILL

WEST 46th STREET
(TRAFFIC FLOW ⇒)

CONCRETE SIDEWALK
STEEL FACED CURB
CONCRETE SIDEWALK
CONCRETE RAMP
OVERHEAD DECK
CHAIN LINK FENCE
GATE
SLIDING GATE
STAIRS
OVERHEAD CANOPY
WAGON SHED (PURIFYING HOUSE)
GAS OIL TANK
OVERHEAD PEDESTRIAN BRIDGE
ASPHALT PARKING LOT
CONCRETE
SHED
TP-10
GAS HOLDER
APPROXIMATE LOCATION OF BURIED BRICK WALL
TRENCH DRAIN
GRANITE CURB
A1
A2
A3
MW-19
PDI-32
MW-1
PDI-1
MW-22
PW-2
PDI-2
PDI-3
SB-3
PDI-5
SB-6
PDI-4
SB-7
PDI-6
PDI-7
MW-3
SB-5
PDI-33
CONT-1
PDI-34
MW-2
CONT-7
CONT-2
SB-10
PDI-9
SB-9
SB-12
PDI-10
PDI-11
PDI-28
PDI-27
SB-1
PDI-30
PDI-29
SB-13
SB-16
PDI-26
CONT-5
MW-24
PW-1
PDI-22
SB-8
PDI-21
MW-5
MW-4
PDI-25
PDI-23
SB-14
PDI-24
MW-21
SB-23
SB-22
PDI-31
PDI-18/
MW-23
PDI-19
SB-19
PDI-20
SB-24
SB-20
RDI-17
SB-21
PDI-15
CONT-4
CONT-8
SB-15
CONT-3
PDI-12
PDI-13
SB-17
PDI-16
MW-6
-5
-10
-15
-20
-25
-30
0
+5
15

12th AVENUE – STATE HIGHWAY 9A (TRAFFIC FLOW ⇑)

(TRAFFIC FLOW ⇐) WEST 45th STREET

LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURES
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL
- ABANDONED PUMPING WELL
- EXISTING PUMPING WELL
- TEST PIT LOCATION
- BEDROCK CONTOURS (DASHED IF INFERRED)
- ISS TO 15'
- ISS TO 30'
- ISS >30'

AREA	Area (sf)	ISS TO 15 FT BGS VOLUME (cy)	ISS 15-30 FT BGS VOLUME (cy)	ISS >30 FT BGS VOLUME (cy)	TOTAL REMEDIATION VOLUME (cy)
AREA 1	820	900	600	0	1,500
AREA 2	9,910	5,500	5,100	600	11,200
AREA 3	10,520	5,800	4,300	40	10,140
TOTAL	21,250	12,200	10,000	640	22,840

30 15 0 30 60

SCALE: 1"=30'

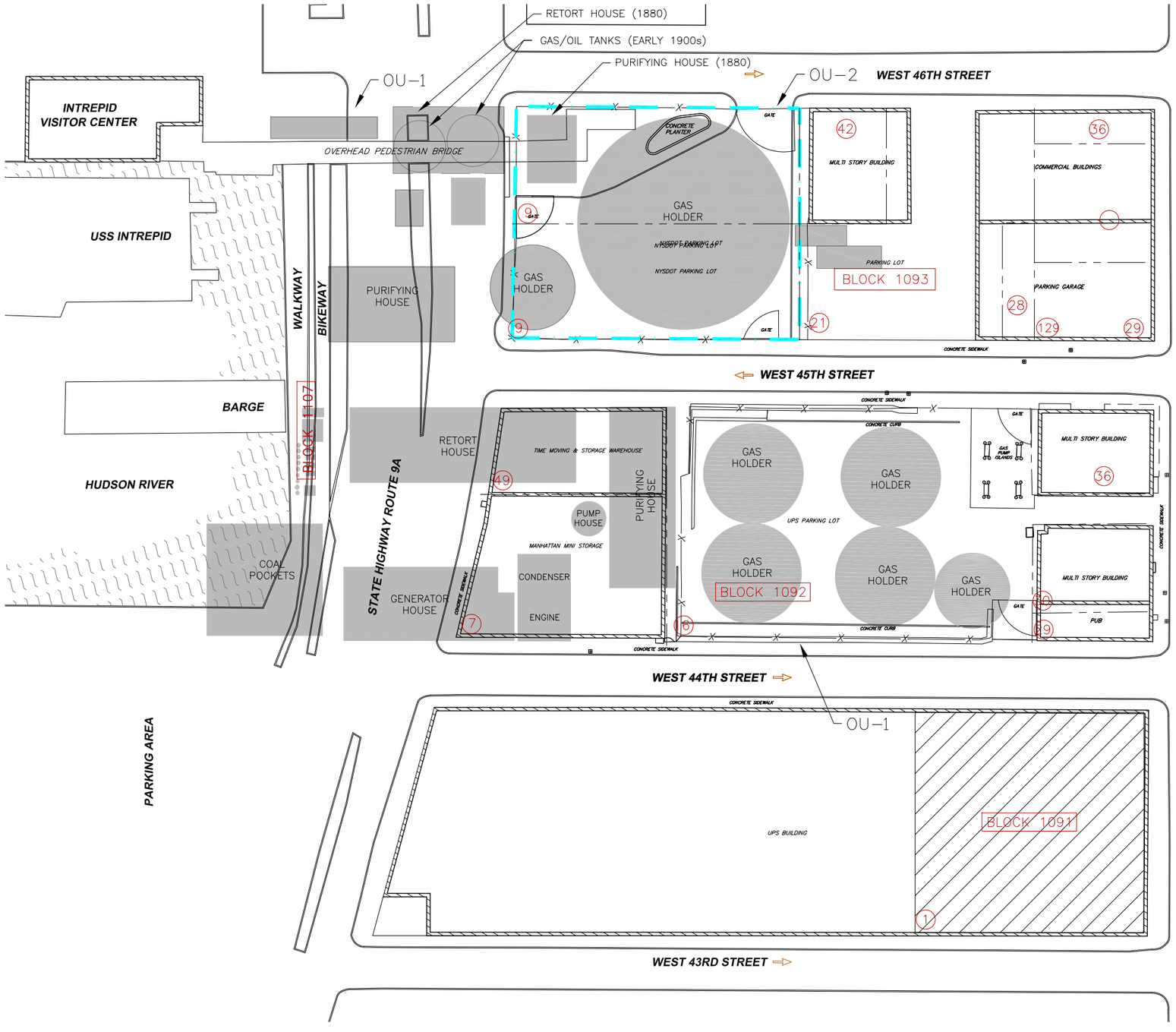
FIGURE 19

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

ALTERNATIVE 2A – ESTIMATED REMEDIATION AREA ISS TO >30'

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\EXCAVATIONS\450089-EXC-ALT 2.DWG
PLOT DATE: 7/31/2017 10:19 AM PLOTTED BY: RUSSO, JILL



LEGEND:

- CURRENT FEATURES
- HISTORICAL FEATURES (LOCATIONS ARE APPROXIMATE)
- EXISTING BUILDING
- CHAIN LINK FENCE
- AREA SUBJECT TO SITE MANAGEMENT PLAN, INSTITUTIONAL AND ENGINEERING CONTROLS
- BLOCK 1093 — TAX BLOCK NUMBER
- 21 — TAX LOT NUMBER FOR PARCELS WITHIN FORMER MGP
- TAX LOT BOUNDARIES
- APPROXIMATE EXTENT OF UPS PARKING GARAGE

100 50 0 100 200

SCALE: 1"=100'

FIGURE 20

CONSOLIDATED EDISON OF NEW YORK
WEST 45th STREET
NEW YORK, NEW YORK

ALTERNATIVE 3 – AREAS SUBJECT TO SITE MANAGEMENT PLAN

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: P:\CONED\450089 – W45TH OU-2 AAR 2016\ENGR\AAR-FIGURES\450089-AAR-SK008.DWG
PLOT DATE: 7/31/2017 10:25 AM PLOTTED BY: RUSSO, JILL

APPENDIX A

2012 PRE-DESIGN INVESTIGATION REPORT

APPENDIX B

ZONING MAP

APPENDIX C

TEST PIT LOGS

APPENDIX D

SOIL BORING LOGS

APPENDIX E

GROUNDWATER SAMPLING LOGS