FINAL ENGINEERING REPORT
For
WEST & WATTS DEVELOPMENT
460 WASHINGTON STREET
New York, New York

NYSDEC Site No. C231076

Prepared For:

Bridge Land West, LLC
c/o The Related Companies
60 Columbus Circle
New York, New York 10013

Prepared By:

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
21 Penn Plaza
360 West 31st Street, 8th Floor
New York, New York 10001

Jason Hayes, P.E.
Professional Engineer License No. 08949-1

December 15, 2014
170167504

LANGAN

CERTIFICATIONS

I, Jason Hayes, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established in for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant to ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement will be recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, and that such plan has been approved by Department.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Jason Hayes, of Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan), am certifying as Owner's Designated Site Representative for the site.

STATE OF NEW YORK
JASON JAMES HAYES
089491
LICENSED PROFESSIONAL ENGINEER

089491-1	12-15-2014	
NYS Professional Engineer #	Date	Stamp/Signature

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LIST OF ACRONYMS

Acronym	Definition
AMS	Air Monitoring Station
BCA	Brownfield Cleanup Agreement
BTEX	Benzene, toluene, ethylbenzene, xylene
bgs	Below grade surface
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
Cy	Cubic yard
DER	Division of Environmental Remediation
El	Elevation
FER	Final Engineering Report
FSO	Field Safety Officer
HASP	Health and Safety Plan
mg/Kg	Milligrams per kilogram
NYCDOB	New York City Department of Buildings
NYSDEC	New York State Department of Environmental Conservation
NYSDEP	New York State Department of Environmental Protection
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
ORC®	Oxygen Release Compound
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
PPE	Personal Protective Equipment
QA	Quality Assurance
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
SCO	Soil Cleanup Objective
sf	Square foot
SMP	Site Management Plan
SOP	Site Operations Plan
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 BACKGROUND AND SITE DESCRIPTION

Bridge Land West, LLC (the Volunteer) entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on March 15, 2012, to investigate and remediate a 25,800 square-foot (sf) property located at 281 West Street and 456 Washington Street (aka 460 Washington Street) in New York, New York (the Site). The Site was remediated in accordance with the NYSDEC-approved December 17, 2012 Remedial Action Work Plan (RAWP) to meet Track 4 standards and has been improved with the foundation of a multi-story residential building with a partial cellar level and paved courtyard area. Estimated completion date for the building is late in 2015. The December 17, 2012 RAWP and NYSDEC approval are included as Appendix A.

The Site is located in the County of New York and is identified as Tax Block 595, Lot 1 (formerly lots 1 and 22; now combined). A Site Location Map is included as Figure 1. The Site is located in an urban area characterized by residential and commercial buildings and parks.

Adjoining properties include:

- an eight-story residential building and an eight-story mixed-use residential and commercial building to the north;
- Watts Street, on the south side of which is a fifteen-story residential building with ground-level commercial space to the south;
- Washington Street, on the east side of which are multi-story residential buildings with ground-level commercial space further east; and
- West Street (Route 9A Highway) and the Hudson River State Park to the west.

Land use within a half-mile radius of the Site includes the sub-grade Holland Tunnel, cross streets, subway tunnels, parkland, and school facilities.

A Site layout plan is included as Figure 2.

2.0 SUMMARY OF SITE REMEDY

2.1 Remedial Action Objectives

A Remedial Investigation (RI) Report, dated December 14, 2012, was prepared by Langan to determine, to the extent possible, the nature and extent of contamination in soil, soil vapor, and groundwater. Based on the results of the RI, the following Remedial Action Objectives (RAOs) were identified for the Site.

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

- 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 to contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

2.2 Description of Selected Remedy

The Site was remediated in accordance with the December 17, 2012 Remedial Action Work Plan (RAWP), which was approved by the NYSDEC. Track 1 unrestricted cleanup levels were not considered achievable due to unacceptable risk factors. The additional excavation required to achieve a Track 1 cleanup was expected to extend below the water table and would substantially complicate support of excavation design for adjoining buildings and roadways, increase truck traffic, and prolong potential exposure to noise and contaminated dust associated with additional excavation. Therefore, a Track 4 remedy was selected for the Site, and residual contaminated media was left in place and managed through the use of engineering and institutional controls.

The factors considered during the selection of the remedy are those listed in 6 NYCRR 375-1.8. The following are components of the selected remedy:

1. A remedial design program was implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principles and techniques were implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:
   - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
   - Reducing direct and indirect greenhouse gas and other emissions;
   - Increasing energy efficiency and minimizing use of non-renewable energy;
   - Conserving and efficiently managing resources and materials;
   - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
   - Maximizing habitat value and creating habitat when possible;
   - Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
   - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
2. Excavation and off-site disposal of fill material impacted with petroleum compounds, metals, and/or polycyclic aromatic hydrocarbons (PAH) exceeding the Track 4 Site-Specific Soil Cleanup Objectives (SCO - Track 4 SCOs are included in Table 1). Remedial excavation extended up to 13 feet below grade

surface (ft bgs) in the proposed cellar (approx. el -7); on average 9 ft bgs in the petroleum-impacted area (approx. el -4); and up to 6 ft bgs in the remaining former Lot 1 area outside of the petroleum-impacted area (approx. el -1), which is the approximate depth of the groundwater table[1].

3. Collection and analysis of documentation soil samples to document contaminant concentrations in soil remaining on site.
4. Dewatering the cellar excavation to accommodate remedial excavation and foundation construction, followed by pre-treatment to meet NYCDEP standards prior to discharge to the city sewer.
5. In-situ Chemical Oxidation (ISCO) was utilized to treat petroleum-related volatile organic compounds (VOC) in groundwater with the application of a chemical oxidant (Oxygen Release Compound or ORC®) into the open excavation in the northwest corner of the Site.
6. Backfilling of remedial excavation areas to development grade with clean fill (meeting the Track 4 Site-Specific SCOs) or virgin, native imported crushed stone.
7. Construction and maintenance of a site cover system consisting of a concrete building slab that spans the entire footprint of the Site, including the courtyard, to prevent human exposure to contaminated soil remaining at the Site.
8. Installation of a vapor barrier below building slabs and outside foundation walls as a precautionary measure to protect against exposure from off-or on –site sources.
9. Post-remediation quarterly groundwater sampling to confirm the effectiveness of the remedy.
10. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to contamination remaining at the Site
11. Development and implementation of a Site Management Plan (SMP) for long-term management of residual contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance, and (4) reporting; and
12. Periodic certification of the institutional and engineering controls listed above.

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[1] All noted elevations are relative to Borough of Manhattan Datum (BMD), which is 2.75 feet above the Mean Sea Level at Sandy Hook, New Jersey, 1929 U.S. Geological Survey National Geodetic Vertical Datum (NGVD, 1929).

3.0 INTERIM REMEDIAL MEASURES, OPERABLE UNITS AND REMEDIAL CONTRACTS

The remedy for the Site was performed as a single project, and no interim remedial measures, operable units or separate construction contracts were performed.

4.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved December 17, 2012 RAWP. Remedial activities commenced with contractor mobilization on June 3, 2013 and were completed on March 14, 2014.

4.1 Governing Documents

4.1.1 Site Specific Health & Safety Plan (HASP)

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including site and worker safety requirements mandated by the Federal Occupational Safety and Health Administration (OSHA).

The Site-specific HASP was complied with for all remedial and invasive work performed at the Site. The HASP provided a mechanism for establishing on-site safe working conditions, safety organization, procedures, and personal protective equipment requirements. The HASP meets the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The HASP included, but was not limited to, the following components listed below:

- Organization and identification of key personnel;
- Training requirements;
- Medical surveillance requirements;
- List of site hazards;
- Excavation safety;
- Work zone descriptions;
- Personal safety equipment and protective clothing requirements;
- Decontamination requirements;
- Standard operating procedures;
- Contingency plans;
- Community Air Monitoring Plan; and
- Material Safety Data Sheets

4.1.2 Quality Assurance Project Plan (QAPP)

The QAPP was included as Appendix G of the RAWP approved by the NYSDEC. The QAPP describes the specific policies, objectives, organization, functional activities and quality assurance/ quality control activities designed to achieve the project data quality objectives.

4.1.3 Soil Excavation Method and Approach

Excavation was conducted using conventional hydraulic excavators (Komatsu PC 400LC excavator and Komatsu PC320C excavator) and hand tools. Following a Track 4 cleanup approach (RAWP Alternative II), soil exceeding the Track 4 SCOs was removed as shown on Figure 3 to depths ranging from 6 to 13 ft bgs (approximately el -1 to el -7).

Excavation structural support consisted of sheet piles with tiebacks and internal bracing around the perimeter of the cellar. Sheet piles were also installed along West and Washington Street to protect roadways immediately adjacent to the Site. Excavation support was not required along the northern sidewall due to the presence of cellar levels extending to approximately el -1.7. Limitations that prevented additional excavation included adjacent structures that may have been compromised.

Soil Dewatering

Construction dewatering was required to reach the proposed cellar excavation depth. Dewatering was conducted within the cellar level using a well point system. Dewatering fluids were pre-treated to reduce contaminant concentrations below the New York City Department of Environmental Protection (NYCDEP) effluent limitations prior to discharge. Pre-treatment included settling tanks, bag filters, and carbon filtration. Approximately 65,250,000 gallons of treated groundwater was discharged into the New York City sewer system in accordance with a NYCDEP permit.

Soil Stockpiles

Soil stockpile areas were constructed for staging soil, pending loading for off-site disposal or characterization testing. Separate stockpile areas were constructed to avoid co-mingling materials of differing types as needed. All stockpile areas met the following minimum requirements:

- Where material types were different (e.g., petroleum-impacted material stockpiled in a non-impacted area), excavated soil was placed onto liners of sufficient strength and thickness to prevent puncture during use;
- Equipment and procedures were used to place and remove the soil such that the potential to jeopardize the integrity of the liner was minimized.

- Stockpiles were covered with plastic sheeting or tarps, which were securely anchored to the ground. Stockpiles were routinely inspected and broken sheeting covers were promptly replaced.
- Stockpiles were covered upon reaching their capacity of approximately 1,000 cubic yards until ready for loading. Stockpiles that did not reach their capacity were covered at the end of each workday.
- Active stockpiles were covered at the end of each workday.
- Stockpiles were encircled with silt fences and hay bales, as needed, to contain and filter particulates from any rainwater that drained off the soils, and to mitigate the potential for surface water run-off.
- The stockpile areas were inspected daily, and noted deficiencies were promptly addressed.
- Individual stockpiles did not exceed 1,000 cubic yards.

Load Out, Transport and Off-Site Disposal Plan

A summary of the quantities of waste removed from the Site is provided in Section 4.3 and in Table 2. RCRA hazardous, petroleum-impacted, and contaminated, non-hazardous historic fill material were encountered during this remediation project. All hazardous and non-hazardous material was handled, transported and disposed in accordance with applicable Part 360 regulations and other applicable local, state and federal regulations. The waste removal contractor provided the appropriate permits, certifications, and written commitments from disposal facilities to accept the material throughout the life of the contract (see Appendix B). Non-hazardous historic fill and petroleum-impacted material was transported by waste removal contractors who possessed a valid New York State Part 364 Waste Transporter Permit under a non-hazardous waste manifests in order to track the waste. Hazardous waste was transported by a waste removal contractor who possessed a valid New York State Part 364 Waste Transporter Permit and a Hazardous Materials Safety Permit, under EPA-generated hazardous waste manifests in order to track the waste.

The Remedial Engineer (RE) reviewed proposed disposal facilities for regulated material before materials left the Site to document that the facilities had the proper permits and to review their requirements. Hazardous and non-hazardous contaminated soil was disposed at facilities licensed to handle this material. Commitment letters were supplied on the facility's letterhead, and included the Site as the originating site, the analytical data provided to and reviewed by the facility, and any restrictions on delivery schedules or other conditions that may have caused rejection of transported materials. Letters of acceptance were received from the following soil disposal facilities: Clean

Earth of Philadelphia, Clean Earth of Carteret, Clean Earth of North Jersey and Prospect Park.

The RE observed the load-out of excavated material. The container trucks were transported to the disposal facility when full. Loaded vehicles leaving the Site were appropriately lined, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (or other applicable transportation requirements).

Truck Traffic Control

The material excavated during this remediation was disposed outside of New York State, except for creosote-treated wood timbers, which were disposed of at 110 Sand Company in West Babylon, New York. Fill material was transported from the Site to the various disposal facilities in New Jersey and Pennsylvania via the West Side Highway to the Lincoln Tunnel or Holland Tunnel (Interstate 78). Truck routes were selected by considering the following:

- Limiting transport through residential areas;
- Use of defined truck routes;
- Minimizing to the extent possible off- Site queuing of trucks entering the facility
- Limiting the total distance to the major thoroughfares;
- Safety in access to highways; and
- Overall safety in transport.

The exterior of all outbound trucks was free of soil before leaving the Site. Locations where vehicles enter or exit the Site were inspected daily for evidence of off-site sediment tracking.

All egress points for truck and equipment transport from the Site were clean of dirt and other materials derived from the Site during remediation and development. Cleaning of the adjacent streets was performed as needed to maintain a clean condition with respect to site-derived materials.

4.1.4 Community Air Monitoring Plan (CAMP)

The CAMP was developed in accordance with the requirements of NYSDEC Division of Environmental Remediation (DER) Draft DER-10 – Technical Guidance for Site Investigation and Remediation and with the provisions of the New York State Department of Health (NYSDOH) Community Air Monitoring Plans (CAMP). The CAMP was developed to protect off-site receptors, including residences and businesses, from potential airborne contaminant releases during intrusive field activities. The CAMP provided for the upwind and downwind real-time monitoring of VOCs and particulates (i.e., dust).

Two stationary air-monitoring stations (AMS) were set up at Site perimeters (one upwind and one downwind) during intrusive Site work for continuous monitoring. Implementation of the CAMP was accomplished at each AMS using TSI Model 8530 DustTRAKs to monitor for particulates and MiniRAE 2000 photoionization detectors (PID) to monitor for VOCs. AMS locations are presented in Figure 4.

Action levels used for the protection of the community and visitors were set forth in the CAMP included in the HASP (Appendix F in the RAWP). As defined in the HASP, the particulate action level at the Site was set at 150 micrograms of dust per cubic meter of air ($\mu g/m^3$) above background, and the VOC action level at the Site was set at 25 parts per million (ppm) for instantaneous readings and above background or 5 ppm above background for a 15-minute average. DustTRAKs and PIDs were monitored on a continuous basis during remediation and construction activities. Fifteen minute running averages were calculated from the data recorded, and averages were compared to the action levels specified in the CAMP.

Field personnel observed ambient air conditions to check for visible dust emissions and/or odors; if observed, mitigation measures were implemented. Preventative measures for dust generation included wetting site fill and soil, construction of an engineered construction entrance with gravel pad, covering soils with tarps, and limiting vehicle speeds to five miles per hour.

Odor and vapor mitigation methods included limiting the time that the excavations remained open, minimizing stockpiling of contaminated-source soil, minimizing the handling of contaminated material, application of foam suppressants or tarps over the odor or VOC source area, and direct load-out of soils to trucks for off-Site disposal. CAMP results are discussed in further detail in Section 4.2.5.

4.1.5 Contractors Site Operations Plans (SOPs)

SOPs for this remedial project consisted of the construction specifications for the Site, including safety, health and emergency response, excavation, storage, handling, transport, and disposal (see Construction Specifications in Appendix C). The Remedial Engineer reviewed all plans and submittals for this remedial project (i.e., those listed above plus contractor and subcontractor submittals) and confirmed that they were in compliance with the RAWP. All required remedial documents were submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

4.1.6 Citizen Participation Plan

The Citizen Participation Plan established a protocol for citizen participation, including creating a document repository to contain a copy of all applicable project documents. A certification of mailing was sent to the NYSDEC project manager following the distribution of all Fact Sheets and notices that included: (1) certification that the Fact Sheets were mailed; (2) the date they were mailed; (3) a copy of the Fact Sheets; (4) a list of recipients (contact list); and (5) a statement that the repository was inspected on May 17, 2013 and that it contained all applicable project documents. Furthermore, no changes were made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC.

A document repository was established at the following location for the duration of the project and contains all applicable project documents:

Hudson Park Branch Library
66 Leroy Street
New York, NY 10014-3929
Phone: 212-243-6876

4.2 Remedial Program Elements

4.2.1 Contractors and Consultants

The Volunteer contracted with Monadnock Construction, Inc. (Monadnock) to act as the Construction Manager. Langan was retained as the Remedial Consultant. Mr. Jason Hayes, P.E. of Langan is the RE of record and is certifying the FER. The Construction Manager selected Darcon Construction (Darcon) to implement the remedial activities at the Site. Darcon is a foundation contractor and has experience performing remediation of contaminated urban sites. The Contractor maintained a full staff and complement of equipment to conduct the remedial activities outlined in the RAWP.

4.2.2 Site Preparation

Prior to commencing site remediation, the Remediation Contractor completed mobilization and site preparation for remedial activities during the last week of May, 2013. Descriptions of mobilization and site preparation activities are provided below.

- Identified the location of all aboveground and underground utilities (e.g., power, gas, water, sewer, telephone), equipment, and structures as necessary to implement the remediation;

- Mobilized necessary remediation personnel, equipment, and materials to the Site;
- Constructed stabilized construction entrances consisting of non-hazardous material capped with a gravel roadway at or near the site exit, which takes into consideration the site setting and site perimeter;
- Installed erosion and sedimentation control measures in accordance with the provisions of the Erosion and Sediment Control Plan;
- Installed temporary fencing or other temporary barriers to limit unauthorized access to areas where remediation activities will be conducted;
- Obtained agency approvals and permits, including DOB and DOT permits (e.g., perimeter fencing, signs, and sidewalk use).

A pre-construction meeting was held with the Volunteer, NYSDEC, Langan, Monadnock and Darcon on May 1, 2013.

A project sign was erected at the Site entrance in May 2013 and remained in place during all phases of the Remedial Action.

4.2.3 General Site Controls

Site Security

The Site was secured during the remedial activities by use of:

- Perimeter security fencing and access gates with locks were installed at the boundary of the Site to prevent access by unauthorized persons;
- Regular health and safety meetings, which included site security discussions. A Field Safety Officer (FSO) was present on-site during the day throughout the course of the remedial activities. The table below provides a list of relevant personnel involved in the Site:

Relevant Site Personnel Table	
Remedial Engineer	Jason Hayes, P.E. (Langan)
Construction Manager	Monadnock Construction, Inc.
Remediation Contractor	Darcon Construction
Health & Safety Officer	Tony Moffa (Langan)
Field Safety Officer (FSO)	Julia Leung (Langan)
Quality Assurance Officer (QAO)	Jennifer Armstrong (Langan)

- Safe work practices, which included:

- Removing heavy equipment from the Site at the end of each work day;
- Maintaining an organized work area, including the proper storage of tools, equipment, materials, and fuels; and
- Warning tape and/or barricades placed around open excavations, hot spots in the process of remediation, and other potentially unsafe areas as determined by the Remedial Engineer.

Problems Encountered

There were no problems encountered.

4.2.4 Soil Screening Results

Field screening was conducted during the invasive soil excavation work for petroleum or solvent odors, staining, and for VOCs using a PID. Excavation base and sidewalls were also screened. PID readings indicated the presence of elevated concentrations of VOCs in the northwest corner of the Site, which is consistent with petroleum impacts observed during remedial investigations.

Petroleum-impacted material was also encountered south of the area delineated during the RI. Documentation sample DS_15 was taken at the base of the excavation in this area, and the analytical results confirmed that the remaining soil exceeded the Track 4 site specific SCOs. Based on the screening results and documentation sample results, the excavation depth at this location was increased from el -1 to approximately el -4 (the extent practical, in order to not undermine the stability of the adjacent street structure).

4.2.5 Nuisance Controls

Nuisances

Potential nuisances related to the site remediation included odors and trucking, which are discussed in detail in Sections 4.1.3 and 4.1.4 above.

Complaints

No complaints related to trucking or odors were filed during the project.

4.2.6 CAMP Results

Air monitoring for particulates and VOCs began at the Site on May 20, 2013, one week prior to Darcon mobilizing to the site, and continued until project completion.

Implementation of the CAMP was accomplished at each AMS using TSI Model 8530 DustTRAKs to monitor for particulates and MiniRAE 2000 PIDs to monitor for VOCs. Fifteen minute running averages were calculated from the data recorded in each respective PID or DustTRAK, and averages were compared to the action levels prescribed in the CAMP.

Three VOC exceedances and two dust exceedances of the action levels occurred during the project. CAMP exceedances were attributable to on-site sources (i.e., concrete chipping and unloading imported backfill adjacent to the downwind station) and unrelated, off-site sources as well as weather conditions. Off-site sources included vehicle exhaust. On-site sources included construction excavation activities and equipment exhaust. Humid, foggy, and wet weather conditions also caused equipment malfunctions resulting in exceedances of VOC action levels. To address CAMP exceedances, mitigation measures were implemented. Mitigation was accomplished primarily through the use of water to suppress dust.

Copies of all field data sheets relating to the CAMP are provided in electronic format in Appendix D.

4.2.7 Reporting

Daily and monthly progress reports were submitted to NYSDEC by electronic media. The progress reports generally included a description of the following:

- Specific remedial activities conducted during the reporting period and those anticipated for the next reporting period;
- Description of approved modifications to the work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable;
- Update of schedule including percentage of project completion, unresolved delays encountered or anticipated that could affect the future schedule, and efforts made to mitigate such delays; and
- List of all types and quantities of waste generated and disposed of during the reporting period
- Qualitative results of daily CAMP monitoring, as well as mitigation measures employed

Daily and monthly progress reports are included in Appendix E. The digital photo log required by the RAWP is included in Appendix F.

4.3 Contaminated Materials Removal

The remedial action included the removal of fill and soil exceeding the Site-specific SCOs and underground storage tank (USTs) encountered during the excavation.

4.3.1 Soil

Material excavated from the Site included RCRA hazardous, petroleum-impacted, and contaminated, non-hazardous material. The Contractor arranged for transportation and off-Site disposal of the excavated material in accordance with applicable federal, state, and local regulations. NYCRR Part 364-permitted transporters were used as required to haul the excavated material to the designated disposal facilities.

A list of the Track 4 Site-Specific SCOs for the contaminants of concern for this project is provided in Table 1. Historic fill and soil exceeding the Track 4 Site-Specific SCOs were removed from the Site to depths of up to 13 feet ft bgs in the proposed cellar (approx. el -7); on average 9 ft bgs in the petroleum-impacted area (approx. el -4); and up to 6 ft bgs in the remaining former Lot 1 area outside of the petroleum-impacted area (approx. el -1), which is the approximate depth of the groundwater table. Table 2 summarizes excavation and disposal quantities and Figure 3 provides the excavation locations and depths.

Material was removed to the extent practical so as not to undermine the stability of the adjacent building and street structures. Excavation structural support consisted of sheet piles with tiebacks and internal bracing around the perimeter of the cellar. Sheet piles were also installed along West and Washington Streets to protect roadways immediately adjacent to the Site. Excavation was conducted using hand tools and conventional hydraulic excavators (Komatsu PC 400LC Komatsu PC320C excavators).

Approximately 8,600 cubic yards (cy) of soil was excavated and disposed of off-site. The excavated material was stockpiled adjacent to the excavation pending off-site soil disposal. Separate stockpile areas were constructed as needed to avoid co-mingling materials of differing types.

Excavation work was implemented in phases over the course of several months in order to maintain building and street stability. When excavation was completed in an area, documentation samples were collected from the excavation base throughout the Site (discussed in Section 4.4) using a grid system for guidance (refer to Figure 5).

Per the RAWP, a direct-application of chemical oxidant was implemented within the northwest corner of the Site during backfilling. Details of the chemical oxidant application are provided in Section 4.6 of this FER. After the oxidant application, the open excavation was backfilled with clean sand, which met NYSDEC Restricted Residential SCOs as specified in the RAWP. Figure 3 shows excavation areas and Table 2 details the quantities of material removed from each grid. Waste disposal manifests and weight tickets are included in Appendix G.

4.3.2 USTs

Seven USTs were encountered during the excavation. The discovery of USTs was consistent with the historical use of the Site as a gasoline filling station. The USTs were decommissioned in accordance with 6NYCRR Part 612.2 and 613.9, and DER-10 section 5.5.

Six 500-gallon USTs were discovered while excavating in the western-central part of the site on July 2, 2013. The USTs were found adjacent to each other and encased in concrete and were filled with a petroleum and water mixture. On July 2 and 3, 2013, Action Environmental pumped 3,450 gallons of oily water and sludge from the USTs. The tank contents were transported to Clean Water located in Staten Island, New York for off-site disposal. Following cleaning of the tanks, the USTs were removed from their concrete encasement, crushed and placed in a metal roll-off container. The tanks were transported to the New York Scrap Metal facility located in the Bronx, New York for off-site disposal as scrap metal on July 8 and 9, 2013.

A crushed 250-gallon UST was encountered while excavating concrete obstructions in the southwest part of the site (adjacent to West Street) on October 7, 2013. Concrete obstructions were removed and the petroleum-impacted material was transported for off-site disposal at a later date. The crushed UST was removed from the excavation on November 5, 2013. Action Environmental cleaned the UST and disposed of it as scrap metal.

Following tank removal, post-excavation soil samples were collected as per the NYSDEC DER-10 requirements. The samples were taken as part of the documentation plan (discussed in Section 4.4 below). A UST registration and closure request were submitted to the NYSDEC Petroleum Bulk Storage (PBS) Section on March 13, 2014, and the NYSDEC on-line PBS database now lists the tanks as closed and removed and the Site as "inactive."

UST closure documentation, such as contractor affidavits, bills of lading for sludge disposal, scrap metal receipts, and PBS Registration number 2-612176, is provided as Appendix H.

4.3.1.1 Disposal Details

Waste Characterization Soil Sampling

For soil requiring off-site disposal, the RE completed waste characterization sampling and analysis in accordance with typical requirements of the disposal facilities. Samples were collected to be representative of the material to be excavated.

The waste characterization sample was analyzed for the following parameters:

- Total petroleum hydrocarbons (TPH) by gas chromatograph/photoionization device (GC/PID);
- Total VOCs by Method 8260;
- Total SVOCs by Method 8270;
- Total PCBs by Method 8082;
- Total metals (14) by Method 6010B;
- Total cyanide;
- Hexavalent Chromium;
- Paint Filter (free liquid);
- RCRA Characteristics - Ignitability, corrosivity, and reactivity;
- Toxic Characteristics Leaching Procedure (TCLP) VOCs, SVOCs, metals and pesticides and herbicides; and
- Diesel Range Organics (DRO) and Gasoline Range Organics (GRO).

Waste characterization sample results identified fill material with hazardous concentrations of lead in the southwest corner of the Site. This area was delineated in a subsequent investigation. The Waste Characterization Report and Hazardous Lead Delineation Report are provided in Appendix I.

Total Quantities Removed

Approximately 8,600 cy of material was removed from Site as part of the Track 4 remedy. Materials transported off-site for disposal included approximately 578.5 cy of RCRA hazardous waste (based on lead concentrations), approximately 1,733.3 cy of petroleum-impacted soil, approximately 5,251.2 cy of contaminated, non-hazardous historic fill material, approximately 205.0 cy of creosote treated wood, and approximately 850.0 cy of concrete (former Site cap). The table below summarizes the quantities of each material and the disposal facilities approved to accept the material.

Hazardous lead material was transported off-site using NJDEP licensed hazardous waste and NYCRR Part 364 permitted transporters. Petroleum-impacted soil and contaminated, non-hazardous historic fill was transported off-site using NYCRR Part 364-permited transporters. Excavation activities occurred from May 29, 2013 through March 14, 2014. The approximate area of soil excavation is indicated on Figure 3, and disposal quantities are summarized in Table 2.

Material Type	Quantity of Material Excavated (cy)	Disposal Facility
Hazardous Lead Soil	578.5	Clean Earth of North Jersey
Petroleum-Impacted Soil	1011.1	Clean Earth of Carteret
Petroleum-Impacted Soil	722.2	Clean Earth of Philadelphia
Historic Fill	963.0	Prospect Park
Historic Fill	3814.1	Clean Earth of Carteret
Historic Fill	474.1	Clean Earth of Philadelphia
Creosote Treated Wood	205	110 Sand Company
Concrete	850.0	Tilcon Kearny

4.3.1.2 On-Site Reuse

Excavated material was not re-used at the Site.

4.4 Remedial Performance/Documentation Sampling

Per the RAWP and NYSDEC DER policy, documentation soil sample collection was completed at a frequency of one sample from the base of the excavation for every 900 square feet. Based on these criteria, twenty-eight base endpoint samples plus the required QA/QC samples, were collected. Tables 3A and 3B and Figure 5 summarize documentation soil sample and QC/QC sample results and include comparison to Site-specific SCOs. Full laboratory reports are included in Appendix J.

Data Usability Summary Reports (DUSRs) were prepared for all soil samples (and related QA/QC samples) collected during the remedy. The data usability review confirmed that the data presented in these reports is of an appropriate quality for its intended usage. These DUSRs are included in Appendix K, and associated raw data is provided in Appendix J.

4.5 In-Situ Chemical Oxidation (ISCO)

ISCO was the remedy selected to treat VOC-impacted groundwater in the northwest part of the Site. ISCO included the application (via direct application) of an aggressive chemical oxidant into the subsurface, with the aim of establishing direct contact between the ISCO chemical solution and the contaminated groundwater media. Based on the nature of the groundwater contamination present at the Site, ISCO (using ORC®) was selected as the technology to treat the groundwater contaminants. ORC® is a preferred technology because it has been demonstrated to be more effective on the major contaminants detected at the Site, including benzene, toluene, ethyl benzene, and xylenes (BTEX compounds). The ISCO application for the Site included a single application event to the northwest corner of the Site, after which, the excavation was backfilled with clean sand. The ORC® application was implemented between January 7 and January 11, 2014 by the Remedial Contractor. Approximately 660 pounds of ORC® was applied to Grid No. 8, and approximately 440 pounds was applied to Grid No.10 (approximately 0.3 pounds per square foot). Table 4 details the quantity of solution applied in the excavation area, and Figure 6 shows the location of the ISCO application.

4.6 Imported Backfill

Approximately 6,420 cy of backfill was imported on Site to bring the excavation to development grade. Materials transported on-site included blend backfill (a mixture of sand and RCA material), sand, recycled concrete aggregate (RCA), and crushed virgin stone. The table below summarizes the quantities of each material and the facilities that imported the fill.

Type of Material	Quantities Imported (cy)	Facility Name	Facility Location	Met Restricted Residential SCOs (Yes/No)
Blend Backfill	1050	Grasselli Point Industries, Inc.	Linden, NJ	Y
Sand	5200	D-Best	Flushing, NY	Y
Recycled Concrete Aggregate (RCA)*	20	RockCrush Grand Ave	Westbury, NY	NA
Blend Backfill*	60	D-Best	Flushing, NY	NA
Virgin 1-1/2" Stone	90	New York Recycling, LLC	Bronx, NY	Y

* Note: This material was imported to the site for temporary use and was subsequently removed from the site and properly disposed.

Imported materials are required to meet sampling requirements consistent with DER-10and Part 375 Restricted Residential Use SCOs. A list of the site-specific SCOs is included in Table 1.

RCA from RockCrush Grand Ave facility and blend backfill from D-Best facility was imported on-site to create a temporary ramp for truck traffic in the northeast corner of the Site. This material was not pre-approved as acceptable backfill prior to import on-site. Following decommission of the ramp, the backfill material was sampled, characterized, and shipped to CEC for off-site disposal.

Backfill activities occurred from July 18, 2013 through March 19, 2014. Imported material documentation, including weight tickets, is provided in Appendix L and backfilled locations are shown in Figure 7.

4.7 Soil Contamination Remaining at the Site

Material was removed from the Site to the extent practical and in order to protect the stability of the adjacent building and street structures. Per the RAWP and NYSDEC DER policy, documentation soil sample collection was completed from the excavation bottom for every 900 square feet of bottom area.

Based on the sampling results, some VOCs, SVOCs, and metals exceeded Track 4 Site-Specific SCOs (see Table 3A). In most cases, the exceedances were of less than one order of magnitude. Based on a review of previous groundwater samples results, groundwater at the Site is not adversely impacted by the compounds in documentation samples that exceed SCOs. Also, over-excavation in these areas is not practical as it would require additional support of excavation, underpinning of adjacent structures, and additional dewatering. Since contaminated soil remains beneath the Site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. These Engineering and Institutional Controls (ECs/ICs) are described in the following sections. Long-term management of these EC/ICs and residual contamination will be performed under the Site Management Plan (SMP) approved by the NYSDEC.

4.8 Post-Remediation Groundwater Sampling

Monitoring Well Installation and Sampling

To monitor the effectiveness of the remedy, two monitoring wells (RI-MW-1 and RI-MW-2) were installed within the eastern West Street sidewalk along the down-gradient side of the Site on October 19, 2012. The location of the two off-site monitoring wells is shown on Figure 8. Groundwater was observed at approximately 6 feet bgs. The wells were installed to a depth of 13 feet bgs, with a 10-foot screen between 3 feet and 13 feet bgs. Monitoring wells were constructed with 1-inch inner diameter (ID), threaded flush-joint, polyvinyl chloride (PVC) casings and screens, with 10 feet of 0.02 inch slotted screen. Clean sand was used to backfill the area around the screen to approximately 1 foot above the screen. A layer of hydrated bentonite was used to fill the annulus around the remainder of the riser to grade. Well construction logs are provided in Appendix M.

Following installation, the monitoring wells were developed by surging and pumping with a peristaltic pump until visually clear of fines. Approximately one week after development, the monitoring wells were sampled using low-flow purging techniques to minimize drawdown. Prior to sampling, the monitoring wells were purged using a Waterra® pump and dedicated, disposable polyethylene tubing. During purging, the turbidity, pH, temperature, conductivity, redox potential, and dissolved oxygen of the groundwater were monitored using a Horiba U-52 Water Quality meter with a flow-through cell. The groundwater was purged until the water quality parameters were stable and the turbidity was below 50 Nephelometric Turbidity Units (NTU) or purging had exceeded one hour. The monitored parameters were recorded on the groundwater sampling logs and are included in Appendix M.

After purging the wells, a groundwater sample was collected from each well in laboratory-supplied containers with appropriate preservatives and shipped under chain-of-custody protocol to York Analytical (a NYSDOH Environmental Lab Accreditation Program (ELAP)-certified laboratory) for analysis of VOCs, SVOCs, and metals (total and dissolved).

Quarterly monitoring is planned for wells RI-MW1 and RI-MW-2 to confirm the effectiveness of the remedy. The first post-remediation quarterly sampling event was completed in June 2014. Low flow sampling procedures were followed and samples were submitted to York Analytical for CP-51 VOCs and SVOCs.

Laboratory Results

Pre- and Post-remediation groundwater analytical results were compared to the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA Ambient Water Quality Standards (AWQS) and Guidance Values. Sample results for pre- and post- remediation groundwater sample results for wells RI-MW1 and RI-MW2 are summarized in Table 5 and shown spatially on Figure 8.

Post-remediation groundwater results showed a decrease (of one or two orders of magnitude) in VOC concentrations at RI-MW1. Concentrations of several VOCs exceeded TOGS Class GA AWQS in the pre-remediation groundwater sample from RI-MW1; however, post-remediation VOC concentrations at RI-MW1 did not exceed TOGS Class GA AWQS. Ethylbenzene and xylene concentrations in RI-MW2 increased to concentrations that marginally exceed TOGS GA AWQS compared to pre-remediation results that did not exceed the criteria. Other VOCs were either not detected or were reported at concentrations below TOGS Class GA AWQS in the post-remediation sample from RI-MW2. The marginal increase in select VOCs in RI-MW2 was likely caused by local disruption to the water table by excavation, sheeting installation, and dewatering. Overall, the data reflects a significant reduction of VOCs in groundwater as a result of the remedy. Continued quarterly monitoring will evaluate this trend.

4.9 Engineering Controls

4.9.1 Site Cover System

Exposure to residual contamination in soil/fill at the Site is prevented by a cover system comprised of concrete slabs that cover the entire footprint of the Site, including the courtyard. As an additional protective measure, a soil vapor mitigation system was installed as a continuous sub-slab membrane under slabs and outside cellar subsurface walls of the building. The vapor barrier has a minimum thickness of 20 mils and is a permanent engineering control for the Site. A survey showing the extent of the concrete cap and vapor barrier specifications are included in Appendix N.

An Excavation Work Plan, which outlines the procedures required in the event the cover system and/or underlying residual contamination are disturbed, is provided the SMP, which is provided in Appendix O.

4.9.2 Other Engineering Controls

The remedy for the Site did not require the construction of any other engineering control systems.

4.10 Institutional Controls

The Site remedy requires that an environmental easement be placed on the property to (1) implement, maintain and monitor the Engineering Controls; (2) prevent future exposure to residual contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the Site to restricted residential uses only. The environmental easement for the Site was executed by the NYSDEC on November 13, 2014, and submitted to the New York City Department of Finance Office of the City Register, with the Manhattan County Clerk on December 12, 2014. The filing transaction number is 2014000409969. A copy of the easement and proof of filing is provided in Appendix P.

4.11 Deviations from the Remedial Action Work Plan

Blend backfill from D-Best facility was imported on-site to create a temporary ramp for truck traffic in the northeast corner of the Site. This material was not pre-approved as acceptable backfill prior to import on-site. Following decommission of the ramp, the backfill material was sampled, characterized, and transported to the CEC facility for off-site disposal.

TABLES

TABLE 1 - Track 4 Site Specific SCOs
West & Watts Development

Contaminant	CAS Number	General Fill - Site SCOs (mg/kg)	Composite Cover Soil - Restricted Residential SCOs (mg/kg)
Metals			
Arsenic	7440-38-2	16	16
Barium	7440-39-3	400	400
Beryllium	7440-41-7	590	72
Cadmium	7440-43-9	9.3	4.3
Chromium, hexavalent	18540-29-9	400	110
Chromium, trivalent	16065-83-1	1,500	180
Copper	7440-50-8	270	270
Total Cyanide		27	27
Lead	7439-92-1	1,000	400
Manganese	7439-96-5	10,000	2,000
Total Mercury		2.8	0.81
Nickel	7440-02-0	310	310
Selenium	7782-49-2	1,500	180
Silver	7440-22-4	1,500	180
Zinc	7440-66-6	10,000	10,000
PCBs/Pesticides			
2,4,5-TP Acid (Silvex)	93-72-1	500	100
4,4'-DDE	72-55-9	62	8.9
4,4'-DDT	50-29-3	47	7.9
4,4'-DDD	72-54-8	92	13
Aldrin	309-00-2	0.68	0.097
alpha-BHC	319-84-6	3.4	0.48
beta-BHC	319-85-7	3	0.36
Chlordane (alpha)	5103-71-9	24	4.2
delta-BHC	319-86-8	500[b]	100
Dibenzofuran	132-64-9	350	59
Dieldrin	60-57-1	1.4	0.2
Endosulfan I	959-98-8	200	24
Endosulfan II	33213-65-9	200	24
Endosulfan sulfate	1031-07-8	200	24
Endrin	72-20-8	89	11
Heptachlor	76-44-8	15	2.1
Lindane	58-89-9	9.2	1.3
Polychlorinated biphenyls	1336-36-3	1	1
Semivolatile organic compounds			
Acenaphthene	83-32-9	500	100
Acenapthylene	208-96-8	500	100
Anthracene	120-12-7	500	100
Benz(a)anthracene	56-55-3	5.6	1
Benzo(a)pyrene	50-32-8	1	1

TABLE 1 - Track 4 Site Specific SCOs
West & Watts Development

Contaminant	CAS Number	General Fill - Site SCOs (mg/kg)	Composite Cover Soil - Restricted Residential SCOs (mg/kg)
Benzo(b)fluoranthene	205-99-2	5.6	1
Benzo(g,h,i)perylene	191-24-2	500	100
Benzo(k)fluoranthene	207-08-9	56	3.9
Chrysene	218-01-9	56	3.9
Dibenz(a,h)anthracene	53-70-3	0.56	0.33
Fluoranthene	206-44-0	500	100
Fluorene	86-73-7	500	100
Indeno(1,2,3-cd)pyrene	193-39-5	5.6	0.5
m-Cresol	108-39-4	500	100
Naphthalene	91-20-3	500	100
o-Cresol	95-48-7	500	100
p-Cresol	106-44-5	500	100
Pentachlorophenol	87-86-5	6.7	6.7
Phenanthrene	85-01-8	500	100
Phenol	108-95-2	500	100
Pyrene	129-00-0	500	100
Volatile organic compounds			
1,1,1-Trichloroethane	71-55-6	500	100
1,1-Dichloroethane	75-34-3	240	26
1,1-Dichloroethene	75-35-4	500	100
1,2-Dichlorobenzene	95-50-1	500	100
1,2-Dichloroethane	107-06-2	30	3.1
cis -1,2-Dichloroethene	156-59-2	500	100
trans-1,2-Dichloroethene	156-60-5	500	100
1,3-Dichlorobenzene	541-73-1	280	49
1,4-Dichlorobenzene	106-46-7	130	13
1,4-Dioxane	123-91-1	130	13
Acetone	67-64-1	500	100
Benzene	71-43-2	44	4.8
n-Butylbenzene	104-51-8	500	100
Carbon tetrachloride	56-23-5	22	2.4
Chlorobenzene	108-90-7	500	100
Chloroform	67-66-3	350	49
Ethylbenzene	100-41-4	390	41
Hexachlorobenzene	118-74-1	6	1.2
Methyl ethyl ketone	78-93-3	500	100
Methyl tert-butyl ether	1634-04-4	500	100
Methylene chloride	75-09-2	500	100
n - Propylbenzene	103-65-1	500	100
sec-Butylbenzene	135-98-8	500	100
tert-Butylbenzene	98-06-6	500	100

TABLE 1 - Track 4 Site Specific SCOs
West & Watts Development

Contaminant	CAS Number	General Fill - Site SCOs (mg/kg)	Composite Cover Soil - Restricted Residential SCOs (mg/kg)
Tetrachloroethene	127-18-4	150	19
Toluene	108-88-3	500	100
Trichloroethene	79-01-6	200	21
1,2,4-Trimethylbenzene	95-63-6	190	52
1,3,5-Trimethylbenzene	108-67-8	190	52
Vinyl chloride	75-01-4	13	0.9
Xylene (mixed)	1330-20-7	500	100

Table 2
Summary of Excavation and Disposal Quantities
West and Watts Development
New York, New York
Langan Project No. 170167504

Grid No.	Dates of Excavation	Depth Interval (ft bgs)	Approximate Quantity of Material Excavated (cy)	Disposal Facility
1	10/16/2013 - 11/25/2013	0-13	963.0	Prospect Park
2	7/9/2013 - 12/23/2013	0-13	740.0	Clean Earth of Carteret
2	12/13/2013 - 12/18/2013	7-13	197.1	Clean Earth of Philadelphia
2 (Hotspot at EB-15)	10/28/2013	0-7	25.9	Clean Earth of North Jersey
3	7/10/2013 - 3/14/2014	0-13	660.0	Clean Earth of Carteret
3	12/13/2013 - 12/18/2013	7-13	277.1	Clean Earth of Philadelphia
3 (Hotspot at EB-8)	10/28/2013	0-7	25.9	Clean Earth of North Jersey
4	7/12/2013 - 3/14/2014	0-13	963.0	Clean Earth of Carteret
5 (Haz Lead)	10/25/2013 - 11/4/2013	0-7	466.7	Clean Earth of North Jersey
5	11/27/2013 - 12/5/2013	7-14	466.7	Clean Earth of Carteret
6	11/7/2013 - 11/27/2013	0-6	184.4	Clean Earth of Carteret
6 (Haz Lead Hotspot)	11/4/2013	0-8	60.0	Clean Earth of North Jersey
7	11/4/2013 - 11/27/2013	0-9	433.3	Clean Earth of Carteret
8	10/30/2013 - 11/7/2013	0-5	407.4	Clean Earth of Philadelphia
8	11/4/2013 - 1/15/2014	5-9	325.9	Clean Earth of Carteret
9	7/11/2013 - 12/5/2013	0-6	511.1	Clean Earth of Carteret
10	10/30/2013 - 12/17/2013	0-5	314.8	Clean Earth of Philadelphia
10	12/20/2013 - 1/15/2014	5-9	251.9	Clean Earth of Carteret
11	7/12/2013 - 10/29/2013	0-6	288.9	Clean Earth of Carteret
Creosote Treated Wood	10/18/2013 - 12/6/2013	Site Excavation	205.0	110 Sand Company
Concrete	6/20/2013 - 11/8/2013	Former Site Cap/Asphalt and Concrete	850.0	Tilcon Kearny

Total: **8618.04 CY**

Notes:
1. ft bgs = feet below grade surface
2. cy = cubic yards

Table 3A
Documentation Sample Results Summary
West & Watts Development
460 Washington Street, New York, New York
NYSDEC BCP No. C231076

SampleID YorkID Sampling Date Elevation	NYSDEC Part 375 Restricted Use SCO	DS_01 13J1126-01 10/30/2013 14:10 -4		DS-02 13L0349-01 12/9/2013 13:15 -4		DUP_2 13L0349-03 12/9/2013 -4		DS_03 13J1074-01 10/29/2013 11:10 -1		DS_04 13J1074-02 10/29/2013 10:50:00 AM -1		DS_05 13G0541-01 7/16/2013 9:30:00 AM -1		DS_06 13G0541-02 7/16/2013 9:00:00 AM -1	
VOCs (mg/kg)															
1,2,4-Trimethylbenzene	190	0.23	U	0.0022	U	0.0044	J	0.0030	U	0.0043	U	0.0026	U	0.93	D
1,2-Dichlorobenzene	500	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	U
1,3,5-Trimethylbenzene	190	0.23	U	0.0030	J	0.0041	J	0.0030	U	0.0043	U	0.0030	J	0.37	J,D
2-Butanone	500	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	U
Acetone	500	0.23	U	0.0035	J	0.0026	U	0.0030	U	0.0043	U	0.014	B	0.28	U
Ethyl Benzene	390	0.26	J,D	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	U
Methylene chloride	500	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.32	J,D
n-Propylbenzene	500	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	U
o-Xylene	~	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	J,D
p- & m- Xylenes	~	0.46	U	0.0044	U	0.0053	U	0.0061	U	0.0085	U	0.0052	U	0.55	U
sec-Butylbenzene	500	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	U
Toluene	500	0.23	U	0.0022	U	0.0026	U	0.0030	U	0.0043	U	0.0026	U	0.28	U
Xylenes, Total	500	0.69	U	0.0067	U	0.0079	U	0.0091	U	0.013	U	0.0078	U	0.83	U
SVOCs (mg/kg)															
Acenaphthene	500	0.0742	U	0.815	D	0.244	J,D	0.186	J	1.18	U	11.9	J	2.32	
Acenaphthylene	500	0.0742	U	0.191	J,D	0.15	U	0.0958	J	1.18	U	11.6	U	1.09	
Anthracene	500	0.0742	U	1.83	D	0.369	J,D	0.425		1.58	J	24.3		6.17	
Benzo(a)anthracene	5.6	0.0742	U	4.16	D	1.21	D	1.12		4.70		**52.3**		**11.4**	
Benzo(a)pyrene	1	0.0742	U	**3.33**	D	**1.04**	D	**1.38**		**3.84**	J	**62.4**		**4.56**	
Benzo(b)fluoranthene	5.6	0.0742	U	3.04	D	0.831	D	1.27		3.56	J	**25.7**		4.24	
Benzo(g,h,i)perylene	500	0.148	U	1.34	D	0.42	J,D	0.874		3.67	J	8.83		0.499	J
Benzo(k)fluoranthene	56	0.0742	U	2.43	D	0.943	D	1.10		4.52	J	33.4		5.30	
Chrysene	56	0.0742	U	3.48	D	1.02	D	1.15		4.78		**57.0**		8.83	
Dibenzo(a,h)anthracene	0.56	0.0742	U	**0.676**	D	0.176	J,D	0.357	J	1.18	U	**4.67**		0.303	J
Dibenzofuran	350	0.0742	U	0.494	J,D	0.15	U	0.151	J	1.18	U	8.58		5.13	
Fluoranthene	500	0.0742	U	7.96	D	2.41	D	2.60		9.72		138		38.1	
Fluorene	500	0.0742	U	0.799	D	0.186	J,D	0.189	J	1.18	U	10.1		4.86	
Indeno(1,2,3-cd)pyrene	5.6	0.0742	U	1.43	D	0.411	J,D	0.803		3.28	J	**9.02**		0.599	J
Naphthalene	500	0.471		0.692	D	0.601	D	0.164	J	1.18	U	17.0		22.4	
Pentachlorophenol	6.7	0.148	U	0.297	U	0.299	U	0.192	U	2.35	U	2.33		0.484	
Phenanthrene	500	0.0742	U	6.91	D	1.33	D	2.27		6.26		149		52.7	
Phenol	500	0.0742	U	0.148	U	0.15	U	0.0958	U	1.18		1.16		0.242	
Pyrene	500	0.0742	U	7.03	D	2.31	D	2.38		9.26		154		34.2	
PCBs (mg/kg)															
Aroclor 1254	~	0.02	U	0.0200	U	0.0202	U	0.0291	U	0.0286	U	0.0188	U	0.0196	U
Total PCBs	1	0.02	U	0.0200	U	0.0202	U	0.0291	U	0.0286	U	0.0188	U	0.0196	U
Metals (mg/kg)															
Arsenic	16	2.51		3.90		3.33		5.22		5.00		5.17		2.96	
Barium	400	36		89.2		125		79.3		177		95.8		71.0	
Cadmium	9.3	0.353	U	0.353	U	0.356	U	0.342	U	0.336	U	0.332	U	0.346	U
Chromium	~	8.63		13.3		12.2		15.9		14.7		20.3		13.9	
Copper	270	13.5		22.0		30.1		68.0		56.3		34.1		17.1	
Lead	1000	16.4		146		199		84.5		533		156		78.0	
Manganese	10000	388		247		237		235		320		369		168	
Mercury	2.8	0.0271		2.63		2.37		**7.08**		**5.10**		1.70		0.522	
Nickel	310	17.4		22.1		20.4		19.7		19.5		23.2		15.8	
Selenium	1500	1.18	U	1.18	U	1.19	U	1.14	U	1.39		1.58		1.15	U
Zinc	10000	33.6		84.4		116		110		162		168		78.1	
Trivalent Chromium (mg/kg)	1500	8.63		13.3		12.2		15.9		14.7		20.3		13.9	
Hexavalent Chromium (mg/kg)	400	0.412	U	0.412	U	0.416	U	0.399	U	0.392	U	0.388	U	0.403	U

Notes:
1. Reults are compared to Site Specefic Soil Cleanup Objectives (SCOs), which are NYSDEC Part 375 Restricted
2. Only detected compounds are shown in table
3. NYSDEC Part 375 Restricted Use SCO exceedances are highlighted and BOLD
4. VOCs= Volatile Organic Compounds
5. SVOCs = Semi-Volatile Organic Compounds
6. PCBs = Polychlorinated Biphenyls
7. mg/kg = milligrams per kilogram
8. DUP is a duplicate sample of DS_25
9. DUP_2 is a duplicate sample of DS_02

Qualifiers:
B=analyte found in the analysis batch blank
D=result is from an analysis that required a dilution
J=analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U=analyte not detected at or above the level indicated
~=this indicates that no regulatory limit has been established for this analyte

Table 3A
Documentation Sample Results Summary
West & Watts Development
460 Washington Street, New York, New York
NYSDEC BCP No. C231076

SampleID	NYSDEC Part 375 Restricted Use SCO	DS_07		DS_08		DS-09		DS_10		DS-11		DS_12		DS_13	
YorkID		13G0541-03		13J1126-02		13L0349-02		13J1074-03		13K0156-01		13G0541-04		13K0812-01	
Sampling Date		7/16/2013 8:00:00 AM		10/30/2013 2:00:00 PM		12/9/2013 13:30		10/29/2013 11:00:00 AM		11/5/2013 1:45:00 PM		7/16/2013 9:30:00 AM		11/21/2013	
Elevation		-1		-4		-4		-1		-1		-1		-7	
VOCs (mg/kg)															
1,2,4-Trimethylbenzene	190	0.038		0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
1,2-Dichlorobenzene	500	0.0026	U	0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
1,3,5-Trimethylbenzene	190	0.036		0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
2-Butanone	500	0.0026	U	0.0066		0.0045		0.0033	U	0.0044	U	0.32	U	0.003	U
Acetone	500	0.0069	J,B	0.017		0.024		0.0033	U	0.037		0.32	U	0.003	U
Ethyl Benzene	390	0.0044	J	0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
Methylene chloride	500	0.0026	U	0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.44	J	0.003	U
n-Propylbenzene	500	0.0056		0.0036	J	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
o-Xylene	~	0.022		0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
p- & m- Xylenes	~	0.023		0.0043	U	0.0044	U	0.0065	U	0.0088	U	0.65	U	0.0061	U
sec-Butylbenzene	500	0.0026	U	0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
Toluene	500	0.0026	U	0.0022	U	0.0022	U	0.0033	U	0.0044	U	0.32	U	0.003	U
Xylenes, Total	500	0.045		0.0065	U	0.0066	U	0.0098	U	0.013	U	0.97	U	0.0091	U
SVOCs (mg/kg)															
Acenaphthene	500	1.05		0.0739	U	0.517	J,D	0.992	U	0.411	U	7.02		0.0673	U
Acenaphthylene	500	0.706	J	0.0739	U	0.158	U	0.992	U	0.411	U	1.46	J	0.0673	U
Anthracene	500	3.32		0.0739	U	1.14	D	2.83	J	0.737	J	12.7		0.0673	U
Benzo(a)anthracene	5.6	**6.29**		0.0739	U	1.24	D	**8.28**		1.89		**29.8**		0.151	J
Benzo(a)pyrene	1	**2.88**		0.0739	U	0.173	J,D	**9.09**		**1.07**	J	**10.9**		0.151	J
Benzo(b)fluoranthene	5.6	3.09		0.0739	U	0.469	J,D	**7.00**		0.773	J	**14.0**		0.0973	J
Benzo(g,h,i)perylene	500	0.631	J	0.148	U	0.316	U	4.73		0.822	U	2.32	U	0.135	U
Benzo(k)fluoranthene	56	3.19		0.0739	U	0.726	D	7.37		0.701	J	11.5		0.131	J
Chrysene	56	5.75		0.0739	U	1.02	D	8.49		1.74		31.9		0.139	J
Dibenzo(a,h)anthracene	0.56	0.309	J	0.0739	U	0.158	U	**2.45**	J	0.411	U	1.16	U	0.0673	U
Dibenzofuran	350	2.29		0.0739	U	1.12	D	0.992	U	0.411	U	7.93	D	0.0673	U
Fluoranthene	500	12.8		0.0739	U	3.21	D	18.5		3.86		63.6		0.251	J
Fluorene	500	2.03		0.0739	U	1.24	D	0.992	U	0.411	U	6.70		0.0673	U
Indeno(1,2,3-cd)pyrene	5.6	0.660	J	0.0739	U	0.315	J,D	5.11		0.411	U	1.88	J	0.0684	J
Naphthalene	500	6.56		0.0739	U	4.33	D	0.992	U	0.411	U	14.8		0.0673	U
Pentachlorophenol	6.7	0.486		0.148	U	0.316	U	1.98	U	0.822	U	2.32		0.135	U
Phenanthrene	500	14.0		0.0739	U	5.17	D	10.1		2.73		77.2		0.11	J
Phenol	500	0.243		0.0739	U	0.158	U	0.992		0.411	U	1.16		0.0673	U
Pyrene	500	14.8		0.0739	U	2.66	D	14.9		3.43		68.3		0.265	J
PCBs (mg/kg)															
Aroclor 1254	~	0.0197	U	0.02	U	0.0213	U	0.276		0.0222	U	0.0188	U	0.0182	U
Total PCBs	1	0.0197	U	0.02	U	0.0213	U	0.276		0.0222	U	0.0188	U	0.0182	U
Metals (mg/kg)															
Arsenic	16	7.48		1.43		4.24		6.01		5.18		3.76		1.07	U
Barium	400	354		50.9		46.4		**434**		235		94.1		31.3	
Cadmium	9.3	0.925		0.352	U	0.376	U	1.85		0.760		0.331	U	0.321	U
Chromium	~	38.6		11.4		19.6		11.4		22.3		17.3		9.85	
Copper	270	34.2		7.68		26.3		37.9		39.7		24.9		8.61	
Lead	1000	279		6.66		54.8		**1590**		501		159		11.2	
Manganese	10000	260		109		307		262		383		275		56.6	
Mercury	2.8	0.588		0.0651		0.452		**3.34**		**5.32**		2.26		0.0353	U
Nickel	310	20.1		18.9		43.2		17.2		31.1		21.1		14.5	
Selenium	1500	2.07		1.17	U	1.25	U	1.18	U	1.30	U	1.59		1.07	U
Zinc	10000	392		17.8		55.8		7930	D	252		121		16	
Trivalent Chromium (mg/kg)	1500	38.6		11.4		19.6		11.4		22.3		17.3		9.85	
Hexavalent Chromium (mg/kg)	400	0.405	U	0.411	U	0.439	U	0.413	U	0.456	U	0.386	U	0.374	U

Notes:
1. Reults are compared to Site Specefic Soil Cleanup Objectives (SCOs), which are NYSDEC Part 375 Restricted
2. Only detected compounds are shown in table
3. NYSDEC Part 375 Restricted Use SCO exceedances are highl
4. VOCs= Volatile Organic Compounds
5. SVOCs = Semi-Volatile Organic Compounds
6. PCBs = Polychlorinated Biphenyls
7. mg/kg = milligrams per kilogram
8. DUP is a duplicate sample of DS_25
9. DUP_2 is a duplicate sample of DS_02

Qualifiers:
B=analyte found in the analysis batch blank
D=result is from an analysis that required a dilution
J=analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U=analyte not detected at or above the level indicated
~=this indicates that no regulatory limit has been established for this analyte

Table 3A
Documentation Sample Results Summary
West & Watts Development
460 Washington Street, New York, New York
NYSDEC BCP No. C231076

SampleID	NYSDEC Part 375 Restricted Use SCO	DS-14		DS-15		DS-15A		DS_16		DS_17		DS_18		DS-19	
YorkID		13K0913-01		13K0156-02		13K0913-02		13L0137-01		13L0137-02		13L0173-04		13L0282-01	
Sampling Date		11/23/2013		11/5/2013 1:50:00 PM		11/23/2013 12:45:00 PM		12/3/2013 9:30		12/3/2013 15:00		12/5/2013 9:45		12/5/2013 14:00	
Elevation		-7		-1		-4		-7		-7		-7		-7	
VOCs (mg/kg)															
1,2,4-Trimethylbenzene	190	0.0029	U	0.023		0.019		0.0035	U	0.0032	U	0.0036	U	0.0029	U
1,2-Dichlorobenzene	500	0.0029	U	0.0069		0.0031	U	0.0035	U	0.0032	U	0.0036	U	0.0029	U
1,3,5-Trimethylbenzene	190	0.0029	U	0.019		0.0078		0.0035	U	0.0032	U	0.0036	U	0.0029	U
2-Butanone	500	0.0029	U	0.0027	U	0.0031	U	0.0035	U	0.0032	U	0.0098		0.011	
Acetone	500	0.012		0.017		0.042		0.056		0.093		0.047		0.08	
Ethyl Benzene	390	0.0029	U	0.0027	U	0.0074		0.0035	U	0.0032	U	0.0036	U	0.0029	U
Methylene chloride	500	0.0029	U	0.0027	U	0.0031	U	0.029		0.022		0.0036	U	0.0029	U
n-Propylbenzene	500	0.0029	U	0.0047	J	0.049		0.0035	U	0.0032	U	0.0036	U	0.0029	U
o-Xylene	~	0.0029	U	0.0081		0.0031	U	0.0035	U	0.0032	U	0.0036	U	0.0029	U
p- & m- Xylenes	~	0.0057	U	0.0091	J	0.0063	U	0.007	U	0.0063	U	0.0072	U	0.0059	U
sec-Butylbenzene	500	0.0029	U	0.0068		0.017		0.0035	U	0.0032	U	0.0036	U	0.0029	U
Toluene	500	0.0029	U	0.0027	U	0.0031	U	0.0035	U	0.0032	U	0.0038	J	0.0029	U
Xylenes, Total	500	0.0086	U	0.017		0.0094	U	0.011	U	0.0095	U	0.011	U	0.0088	U
SVOCs (mg/kg)															
Acenaphthene	500	0.0666	U	0.442	J	2.4		0.0883	U	0.0794	U	0.0562	U	0.0578	U
Acenaphthylene	500	0.0666	U	0.355	U	0.361	U	0.0883	U	0.0794	U	0.0562	U	0.0578	U
Anthracene	500	0.0666	U	1.02	J	0.667	J	0.0883	U	0.149	J	0.074	J	0.0578	U
Benzo(a)anthracene	5.6	0.165	J	2.39		0.896	J	0.0883	U	0.247	J	0.163	J	0.0578	U
Benzo(a)pyrene	1	0.188	J	**1.71**		0.756	J	0.0883	U	0.0794	U	0.124	J	0.0578	U
Benzo(b)fluoranthene	5.6	0.178	J	1.55		0.799	J	0.0883	U	0.0794	U	0.113	J	0.0578	U
Benzo(g,h,i)perylene	500	0.133	U	0.710	U	0.721	U	0.177	U	0.159	U	0.112	U	0.116	U
Benzo(k)fluoranthene	56	0.169	J	2.01		0.836	J	0.0883	U	0.0794	U	0.119	J	0.0578	U
Chrysene	56	0.188	J	2.36		1.01	J	0.0883	U	0.487		0.138	J	0.0578	U
Dibenzo(a,h)anthracene	0.56	0.0666	U	0.355	U	0.361	U	0.0883	U	0.0794	U	0.0562	U	0.0578	U
Dibenzofuran	350	0.0666	U	0.355	U	1.2	J	0.0883	U	0.0794	U	0.0562	U	0.0578	U
Fluoranthene	500	0.243	J	5.23		3.76		0.0883	U	0.11	J	0.353		0.0578	U
Fluorene	500	0.0666	U	0.406	J	1.33	J	0.0883	U	0.422		0.0562	U	0.0578	U
Indeno(1,2,3-cd)pyrene	5.6	0.0666	U	0.575	J	0.361	U	0.0883	U	0.0794	U	0.0562	U	0.0578	U
Naphthalene	500	0.0666	U	0.527	J	1.6		0.0883	U	0.439		0.0616	J	0.0578	U
Pentachlorophenol	6.7	0.133	U	0.710	U	0.721		0.177	U	0.159	U	0.112	U	0.116	U
Phenanthrene	500	0.118	J	3.74		5.64		0.0883	U	0.784		0.327		0.0578	U
Phenol	500	0.0666	U	0.355		0.361		0.0883	U	0.0794	U	0.0562	U	0.0578	U
Pyrene	500	0.225	J	4.48		2.88		0.0883	U	0.602		0.313		0.0578	U
PCBs (mg/kg)															
Aroclor 1254	~	0.018	U	0.0192	U	0.0195	U	0.0238	U	0.0214	U	0.0341	U	0.0234	U
Total PCBs	1	0.018	U	0.0192	U	0.0195	U	0.0238	U	0.0214	U	0.0341	U	0.0234	U
Metals (mg/kg)															
Arsenic	16	1.45		4.73		3.79		8.59		6.77		6.75		8.43	
Barium	400	50.6		155		109		34.1		27.8		42.8		27.3	
Cadmium	9.3	0.317	U	0.338	U	0.367		0.42	U	0.378	U	0.401	U	0.413	U
Chromium	~	10.3		13.4		12.2		22.8		19.7		21.4		18.9	
Copper	270	12.5		60.8		61.7		13.2		12.2		18.4		11.5	
Lead	1000	31.6		272		244		18.4		12.7		47.2		12.1	
Manganese	10000	263		315		246		1060		929		473		485	
Mercury	2.8	0.101		**5.08**		2.38		0.0942		0.253		0.415		0.0454	U
Nickel	310	16.9		20.8		20.4		30.4		27.5		28.2		25.6	
Selenium	1500	1.06	U	1.13	U	1.14	U	1.4	U	1.26	U	1.34	U	1.38	U
Zinc	10000	45.9		240		175		57.8		55.9		67.4		49.3	
Trivalent Chromium (mg/kg)	1500	10.3		13.4		12.2		22.8		19.7		21.4		18.9	
Hexavalent Chromium (mg/kg)	400	0.37	U	0.394	U	0.401	U	0.49	U	0.441	U	0.468	U	0.482	U

Notes:
1. Reults are compared to Site Specefic Soil Cleanup Objectives (SCOs), which are NYSDEC Part 375 Restricted
2. Only detected compounds are shown in table
3. NYSDEC Part 375 Restricted Use SCO exceedances are highl
4. VOCs= Volatile Organic Compounds
5. SVOCs = Semi-Volatile Organic Compounds
6. PCBs = Polychlorinated Biphenyls
7. mg/kg = milligrams per kilogram
8. DUP is a duplicate sample of DS_25
9. DUP_2 is a duplicate sample of DS_02

Qualifiers:
B=analyte found in the analysis batch blank
D=result is from an analysis that required a dilution
J=analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U=analyte not detected at or above the level indicated
~=this indicates that no regulatory limit has been established for this analyte

Table 3A
Documentation Sample Results Summary
West & Watts Development
460 Washington Street, New York, New York
NYSDEC BCP No. C231076

SampleID YorkID Sampling Date Elevation	NYSDEC Part 375 Restricted Use SCO	DS_20 13L0736-03 12/20/2013 7:50 -7		DS_21 13L0736-02 12/20/2013 7:40:00 AM -4		DS-22 13K0913-03 11/23/2013 10:45:00 AM -1		DS-23 13K0913-04 11/23/2013 10:50:00 AM -1		DS_24 13L0173-01 12/4/2013 9:00 -7		DS_25 13L0173-03 12/5/2013 9:00 -7		DUP 13L0173-05 12/5/2013 9:00:00 AM -7	
VOCs (mg/kg)															
1,2,4-Trimethylbenzene	190	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
1,2-Dichlorobenzene	500	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
1,3,5-Trimethylbenzene	190	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
2-Butanone	500	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.027		0.01		0.012	
Acetone	500	0.044		0.13		0.024		0.012		0.13		0.049		0.061	
Ethyl Benzene	390	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
Methylene chloride	500	0.0026	U	0.19		0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
n-Propylbenzene	500	0.0026	U	0.0089	U	0.0025	U	0.004	J	0.004	U	0.0029	U	0.0037	U
o-Xylene	~	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
p- & m- Xylenes	~	0.0053	U	0.018	U	0.005	U	0.006	U	0.008	U	0.0058	U	0.0074	U
sec-Butylbenzene	500	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
Toluene	500	0.0026	U	0.0089	U	0.0025	U	0.003	U	0.004	U	0.0029	U	0.0037	U
Xylenes, Total	500	0.0079	U	0.027	U	0.0075	U	0.009	U	0.012	U	0.0087	U	0.011	U
SVOCs (mg/kg)															
Acenaphthene	500	0.0923	U	0.0453	U	1.09		0.145	U	0.0648	U	0.064	U	0.0644	U
Acenaphthylene	500	0.0923	U	0.0453	U	0.149	U	0.145	U	0.0648	U	0.064	U	0.0644	U
Anthracene	500	0.155	J,D	0.0453	U	0.378	J	0.145	U	0.0648	U	0.064	U	0.0644	U
Benzo(a)anthracene	5.6	0.51	D	0.0453	U	0.541	J	0.145	U	0.0695	J	0.064	U	0.0644	U
Benzo(a)pyrene	1	0.411	D	0.0453	U	0.546	J	0.161	J	0.0648	U	0.064	U	0.0644	U
Benzo(b)fluoranthene	5.6	0.328	J,D	0.0453	U	0.513	J	0.213	J	0.0648	U	0.064	U	0.0644	U
Benzo(g,h,i)perylene	500	0.185	U	0.0907	U	0.298	U	0.29	U	0.13	U	0.128	U	0.129	U
Benzo(k)fluoranthene	56	0.346	J,D	0.0453	U	0.525	J	0.187	J	0.0648	U	0.064	U	0.0644	U
Chrysene	56	0.437	D	0.0453	U	0.624		0.19	J	0.0648	U	0.064	U	0.0644	U
Dibenzo(a,h)anthracene	0.56	0.0923	U	0.0453	U	0.149	U	0.145	U	0.0648	U	0.064	U	0.0644	U
Dibenzofuran	350	0.0923	U	0.0453	U	0.58	J	0.145	U	0.0648	U	0.064	U	0.0644	U
Fluoranthene	500	0.785	D	0.0453	U	2.37		0.4	J	0.17	J	0.064	U	0.0644	U
Fluorene	500	0.0923	U	0.0453	U	0.666		0.145	U	0.0648	U	0.064	U	0.0644	U
Indeno(1,2,3-cd)pyrene	5.6	0.147	J,D	0.0453	U	0.149	U	0.145	U	0.0648	U	0.064	U	0.0644	U
Naphthalene	500	0.0923	U	0.0453	U	0.889		0.145	U	0.0648	U	0.064	U	0.0644	U
Pentachlorophenol	6.7	0.185	U	0.0907	U	0.298		0.29	U	0.13	U	0.128	U	0.129	U
Phenanthrene	500	0.5	D	0.0453	U	3.73		0.324	J	0.147	J	0.064	U	0.0644	U
Phenol	500	0.0923	U	0.0453	U	0.149		0.145	J	0.0648	U	0.064	U	0.0644	U
Pyrene	500	0.842	D	0.0453	U	1.93		0.334	J	0.136	J	0.064	U	0.0644	U
PCBs (mg/kg)															
Aroclor 1254	~	0.028	U	0.0275	U	0.0201	U	0.0195	U	0.0394	U	0.0389	U	0.0391	U
Total PCBs	1	0.028	U	0.0275	U	0.0201	U	0.0195	U	0.0394	U	0.0389	U	0.0391	U
Metals (mg/kg)															
Arsenic	16	1.61		1.26		3.63		4.22		7.06		8.5		8.62	
Barium	400	42		39.2		79.1		88.3		71.1		40.8		41.5	
Cadmium	9.3	0.33	U	0.324	U	0.355	U	0.345	U	0.463	U	0.457	U	0.46	U
Chromium	~	9.82		15.2		11.9		15		21.7		24.1		26.3	
Copper	270	13.4		8.75		52		36.9		39.5		26.6		23.8	
Lead	1000	26.2		4.45		152		125		137		57.1		56.5	
Manganese	10000	141		87.7		277		272		516		505		550	
Mercury	2.8	0.123		0.00551		2.46		1.51		0.0509	U	0.0503	U	0.0506	U
Nickel	310	15.5		16.6		23.9		34.6		32.1		33.2		35.4	
Selenium	1500	1.1	U	1.08	U	1.18	U	1.15	U	1.54	U	1.52	U	1.53	U
Zinc	10000	37.3		19.7		137		76.5		81.5		68.9		72.7	
Trivalent Chromium (mg/kg)	1500	9.82		15.2		11.9		15		21.7		24.1		26.3	
Hexavalent Chromium (mg/kg)	400	0.385	U	0.378	U	0.414	U	0.402	U	0.54	U	0.533	U	0.537	U

Notes:
1. Reults are compared to Site Specefic Soil Cleanup Objectives (SCOs), which are NYSDEC Part 375 Restricted
2. Only detected compounds are shown in table
3. NYSDEC Part 375 Restricted Use SCO exceedances are highl
4. VOCs= Volatile Organic Compounds
5. SVOCs = Semi-Volatile Organic Compounds
6. PCBs = Polychlorinated Biphenyls
7. mg/kg = milligrams per kilogram
8. DUP is a duplicate sample of DS_25
9. DUP_2 is a duplicate sample of DS_02

Qualifiers:
B=analyte found in the analysis batch blank
D=result is from an analysis that required a dilution
J=analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U=analyte not detected at or above the level indicated
~=this indicates that no regulatory limit has been established for this analyte

Table 3A
Documentation Sample Results Summary
West & Watts Development
460 Washington Street, New York, New York
NYSDEC BCP No. C231076

SampleID YorkID Sampling Date Elevation	NYSDEC Part 375 Restricted Use SCO	DS-26 13L0282-02 12/5/2013 14:00 -7		DS_27 13L0736-04 12/20/2013 8:00 -4		DS_28 13L0736-01 12/20/2013 7:30:00 AM -4	
VOCs (mg/kg)							
1,2,4-Trimethylbenzene	190	0.003	U	0.0025	U	0.0028	U
1,2-Dichlorobenzene	500	0.003	U	0.0025	U	0.0028	U
1,3,5-Trimethylbenzene	190	0.003	U	0.0025	U	0.0028	U
2-Butanone	500	0.003	U	0.0025	U	0.0028	U
Acetone	500	0.033		0.0025	U	0.035	
Ethyl Benzene	390	0.003	U	0.0025	U	0.0028	U
Methylene chloride	500	0.003	U	0.0025	U	0.0028	U
n-Propylbenzene	500	0.003	U	0.0025	U	0.0028	U
o-Xylene	~	0.003	U	0.0025	U	0.0028	U
p- & m- Xylenes	~	0.006	U	0.0049	U	0.0055	U
sec-Butylbenzene	500	0.003	U	0.0025	U	0.0028	U
Toluene	500	0.003	U	0.0025	U	0.0028	U
Xylenes, Total	500	0.009	U	0.0074	U	0.0083	U
SVOCs (mg/kg)							
Acenaphthene	500	0.0537	U	0.0445	U	0.0453	U
Acenaphthylene	500	0.0537	U	0.0445	U	0.0453	U
Anthracene	500	0.069	J	0.0445	U	0.0453	U
Benzo(a)anthracene	5.6	0.264		0.0445	U	0.0453	U
Benzo(a)pyrene	1	0.233		0.0445	U	0.0453	U
Benzo(b)fluoranthene	5.6	0.157	J	0.0445	U	0.0453	U
Benzo(g,h,i)perylene	500	0.114	J	0.089	U	0.0907	U
Benzo(k)fluoranthene	56	0.202	J	0.0445	U	0.0453	U
Chrysene	56	0.23		0.0445	U	0.0453	U
Dibenzo(a,h)anthracene	0.56	0.0537	U	0.0445	U	0.0453	U
Dibenzofuran	350	0.0537	U	0.0445	U	0.0453	U
Fluoranthene	500	0.514		0.0445	U	0.0453	U
Fluorene	500	0.0537	U	0.0445	U	0.0453	U
Indeno(1,2,3-cd)pyrene	5.6	0.105	J	0.0445	U	0.0453	U
Naphthalene	500	0.0537	U	0.0445	U	0.0453	U
Pentachlorophenol	6.7	0.107	U	0.089	U	0.0907	U
Phenanthrene	500	0.312		0.0445	U	0.0453	U
Phenol	500	0.0537	U	0.0445	U	0.0453	U
Pyrene	500	0.484		0.0445	U	0.0453	U
PCBs (mg/kg)							
Aroclor 1254	~	0.0217	U	0.027	U	0.0275	U
Total PCBs	1	0.0217	U	0.027	U	0.0275	U
Metals (mg/kg)							
Arsenic	16	5.68		1.13		1.16	
Barium	400	47.4		32		40.6	
Cadmium	9.3	0.384	U	0.318	U	0.324	U
Chromium	~	18		8.37		8.36	
Copper	270	25.4		8.98		7.65	
Lead	1000	79		7.45		4.60	
Manganese	10000	430		69.5		77.9	
Mercury	2.8	0.0422	U	0.0143		0.00464	
Nickel	310	24.9		13.7		12.8	
Selenium	1500	1.28	U	1.06	U	1.08	U
Zinc	10000	67.6		15.8		15.5	
Trivalent Chromium (mg/kg)	1500	18		8.37		8.36	
Hexavalent Chromium (mg/kg)	400	0.448	U	0.371	U	0.378	U

Notes:
1. Reults are compared to Site Specefic Soil Cleanup Objectives (SCOs), which are NYSDEC Part 375 Restricted
2. Only detected compounds are shown in table
3. NYSDEC Part 375 Restricted Use SCO exceedances are highl
4. VOCs= Volatile Organic Compounds
5. SVOCs = Semi-Volatile Organic Compounds
6. PCBs = Polychlorinated Biphenyls
7. mg/kg = milligrams per kilogram
8. DUP is a duplicate sample of DS_25
9. DUP_2 is a duplicate sample of DS_02

Qualifiers:
B=analyte found in the analysis batch blank
D=result is from an analysis that required a dilution
J=analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
U=analyte not detected at or above the level indicated
~=this indicates that no regulatory limit has been established for this analyte

Table 3B
QA/QC Sample Results Summary
West & Watts Development
460 Washington Street, New York, New York
NYSDEC BCP No. C231076

SampleID YorkID Sampling Date	Field Blank_120913 13L0349-04 12/9/2013 2:00:00 PM	FB_120413 13L0173-02 12/4/2013 3:00:00 PM
VOCs (µg/L)		
Total VOCs	ND	ND
SVOCs (µg/L)		
Total SVOCs	ND	ND
PCBs (µg/L)		
Total PCBs	ND	ND
Metals (µg/L)		
Zinc	15	18
Trivalent Chromium (µg/L)	ND	ND
Hexavalent Chromium (µg/L)	ND	ND

Notes:
1. Only detected compounds are shown in table
2. VOCs = Volatile Organic Compounds
3. SVOCs = Semi-Volatile Organic Compounds
4. PCBs = Polychlorinated Biphenyls
5. µg/L = micrograms per liter

Qualifiers:
ND=analyte not detected

Table 4
Summary of ORC Application - Direct Topical Application
West & Watts Development
New York, New York
Langan Project No. 170167504

Grid No.	Application Date	ORC Applied (lb)
8	1/7/2014	220.4
8	1/8/2014	220.4
8	1/9/2014	220.4
10	1/10/2014	220.4
10	1/11/2014	220.4

Total: **1102 lb**

Notes:
1. lb = pounds
2. ORC = Oxygen Release Compound

Table 5: Pre- and Post Remediation Groundwater Sample Results
Final Engineering Report
West & Watts Development
460 Washington Street
New York, New York
Langan Project No. 170167504

		RI-MW1						RI-MW-2					
Sample ID	**NYSDEC TOGS Standards and Guidance Values - GA**	**RI-MW1**		**R1-MW-1_061014**		**R1-MW-3_061014**		**R1-MW2**		**DUP-03**		**R1-MW-2_061014**	
Laboratory ID		**12L0797-01**		**14F0473-01**		**14F0473-03**		**12L0753-01**		**12L0753-06**		**14F0473-02**	
Sampling Date		**12/20/2012**		**6/10/2014**		**6/10/2014**		**12/19/2012**		**12/19/2012**		**6/10/2014**	
Compound													
Volatile Organic Compounds (VOCs) (ug/L)													
1,2,4-Trimethylbenzene	5	**180**		4.2	J	3.8	J	1.4	J	1.3	J	3.8	J
1,3,5-Trimethylbenzene	5	**59**		0.48	U	0.48	U	0.48	U	0.48	U	1.2	J
2-Butanone	50	4.1	J	NA		NA		1.5	U	1.5	U	NA	
Acetone	50	7.5	J	NA		NA		6.1	U	6.1	U	NA	
Benzene	1	**14**		0.3	U	0.3	U	1	J	1	J	0.3	U
Ethyl Benzene	5	**90**		1.5	J	1.6	J	0.9	J	0.87	J	**15**	
Isopropylbenzene	5	**22**		0.85	J	0.63	U	0.63	U	0.63	U	1.2	J
n-Butylbenzene	5	**9.9**		0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
n-Propylbenzene	5	**62**		1.4	J	1.2	J	1.2	J	1.3	J	2.4	J
Naphthalene	10	**47**		1.2	U	1.2	U	2.8	J,B	2.5	J,B	1.2	JB
o-Xylene	~	55		0.85	J	1	J	0.21	U	0.21	U	19	
p- & m- Xylenes	~	170		1.7	J	2	J	1.3	J	1.3	J	47	
sec-Butylbenzene	5	**5.3**		0.59	U	0.59	U	0.59	U	0.59	U	0.59	U
Toluene	5	**9.7**		0.17	U	0.17	U	0.17	U	0.17	U	0.83	J
Xylenes, Total	5	**230**		2.6	J	3	J	1.3	J	1.3	J	**66**	
Semi-volatile Organic Compounds (SVOCs) (ug/L)													
2-Methylnaphthalene	~	5.34						3.15	U	3.15	U		
Acenaphthene	20	0.277		0.056	U	0.054	U	0.831		0.0332	U	0.056	U
Fluoranthene	50	0.154		0.056	U	0.054	U	0.892		0.0163	U	0.056	U
Fluorene	50	0.133		0.056	U	0.054	U	0.0331	U	0.0331	U	0.056	U
Naphthalene	10	3.96	U	0.27		0.23		3.96	U	3.96	U	0.22	
Phenanthrene	50	0.133		0.056	U	0.054	U	0.954		0.0371	U	0.056	U
Pyrene	50	0.103		0.056	U	0.054	U	0.0246	U	0.0246	U	0.056	U
Metals, Dissolved (ug/L)													
Aluminum	~	10	U	NA		NA		10	U	10	U	NA	
Antimony	3	**5**		NA		NA		**6**		3	U	NA	
Arsenic	25	4	U	NA		NA		4	U	4	U	NA	
Barium	1000	234		NA		NA		272		271		NA	
Beryllium	~	1	U	NA		NA		1	U	1	U	NA	
Cadmium	5	2	U	NA		NA		2	U	2	U	NA	
Calcium	~	356000		NA		NA		567000	D	566000	D	NA	
Chromium	50	2	U	NA		NA		2	U	2	U	NA	
Cobalt	~	2	U	NA		NA		2	U	2	U	NA	
Copper	200	2	U	NA		NA		2	U	2	U	NA	
Iron	~	10	U	NA		NA		10	U	21		NA	
Lead	25	2	U	NA		NA		4		4		NA	
Magnesium	35000	**124000**		NA		NA		**188000**		**187000**		NA	
Manganese	300	**416**		NA		NA		**3010**		**3040**		NA	
Nickel	100	5		NA		NA		7		7		NA	
Potassium	~	106000		NA		NA		83600		85400		NA	
Selenium	10	7	U	NA		NA		**20**		**14**		NA	
Silver	50	2	U	NA		NA		2	U	2	U	NA	
Sodium	~	833000	D	NA		NA		987000	D	960000	D	NA	
Thallium	~	3	U	NA		NA		3	U	3	U	NA	
Vanadium	~	2	U	NA		NA		2	U	2	U	NA	
Zinc	~	2	U	NA		NA		2	U	2	U	NA	
Mercury	0.7	0.039	U	NA		NA		0.039	U	0.039	U	NA	
Total Metals (ug/L)													
Aluminum	~	1620		NA		NA		25700		17500		NA	
Antimony	3	**5**		NA		NA		3	J	3	U	NA	
Arsenic	25	4	J	NA		NA		**33**		**30**		NA	
Barium	1000	307		NA		NA		893		804		NA	
Calcium	~	362000		NA		NA		630000	D	621000	D	NA	
Chromium	50	7		NA		NA		**99**		**62**		NA	
Cobalt	~	2	J	NA		NA		43		33		NA	
Copper	200	18		NA		NA		**219**		171		NA	
Iron	~	3260		NA		NA		67400		49000		NA	
Lead	25	**78**		NA		NA		**544**		**483**		NA	
Magnesium	35000	**126000**		NA		NA		**208000**		**202000**		NA	
Manganese	300	**657**		NA		NA		**5390**		**5090**		NA	
Nickel	100	11		NA		NA		**195**		**129**		NA	
Potassium	~	109000		NA		NA		95100		91400		NA	
Selenium	10	7	U	NA		NA		**11**		7	J	NA	
Sodium	~	828000	D	NA		NA		976000	D	946000	D	NA	
Vanadium	~	2	J	NA		NA		82		65		NA	
Zinc	~	56		NA		NA		223		173		NA	
Mercury	0.7	0.04	U	NA		NA		0.5		0.2		NA	

NOTES:

1. Only detected compounds are shown.

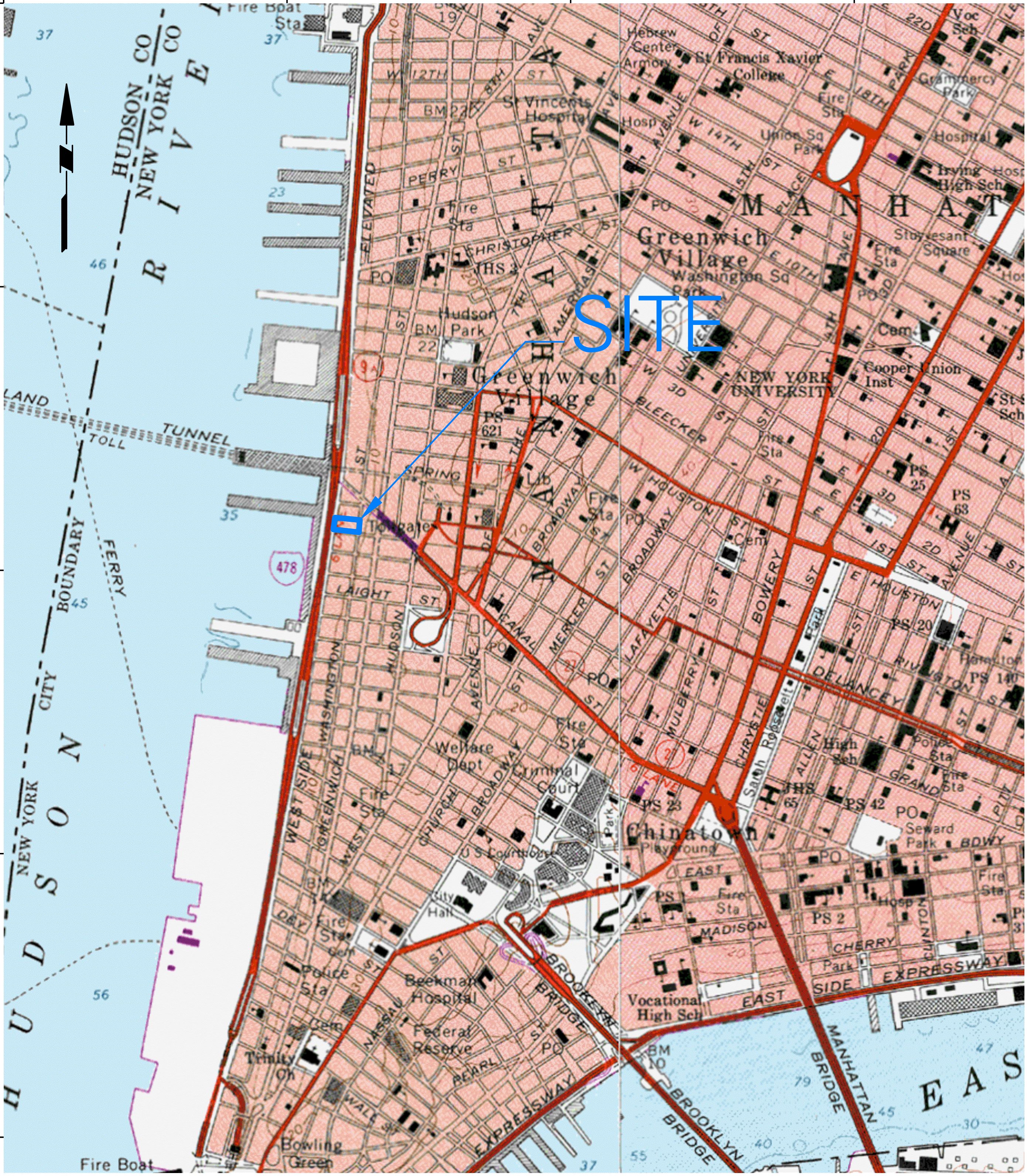
2. Compounds which exceed the New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) Class GA Ambient Water Quality Standards (AWQS) are highlighted and **BOLD.**

3. ~ indicates that no regulatory limit has been established for this analyte.
4. DUP-03 is a duplicate sample of RI-MW2.
5. RI-MW-3_061014 is a duplicate sample of RI-MW-1_061014.
6. ug/L = microgram per liter

QUALIFIERS:

U = Analyte not detected
J = Analyte was detected at or above the MDL but below the reporting limit. The result is an estimate.
B = Analyte found in the analysis batch blank
D = Result is from an analysis that required a dilution
NA = Not analyzed

FIGURES



WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

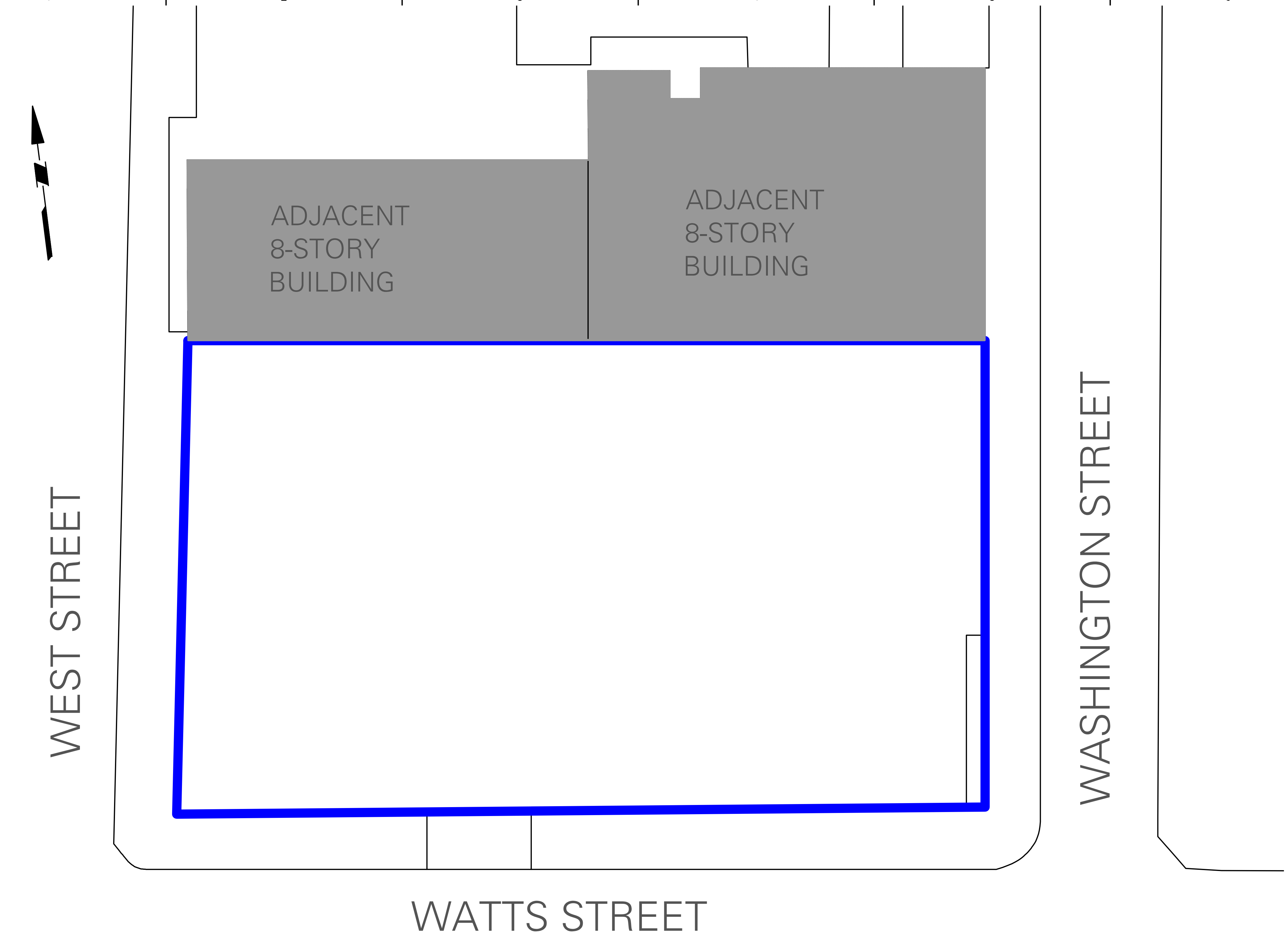
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan International LLC
Collectively known as Langan

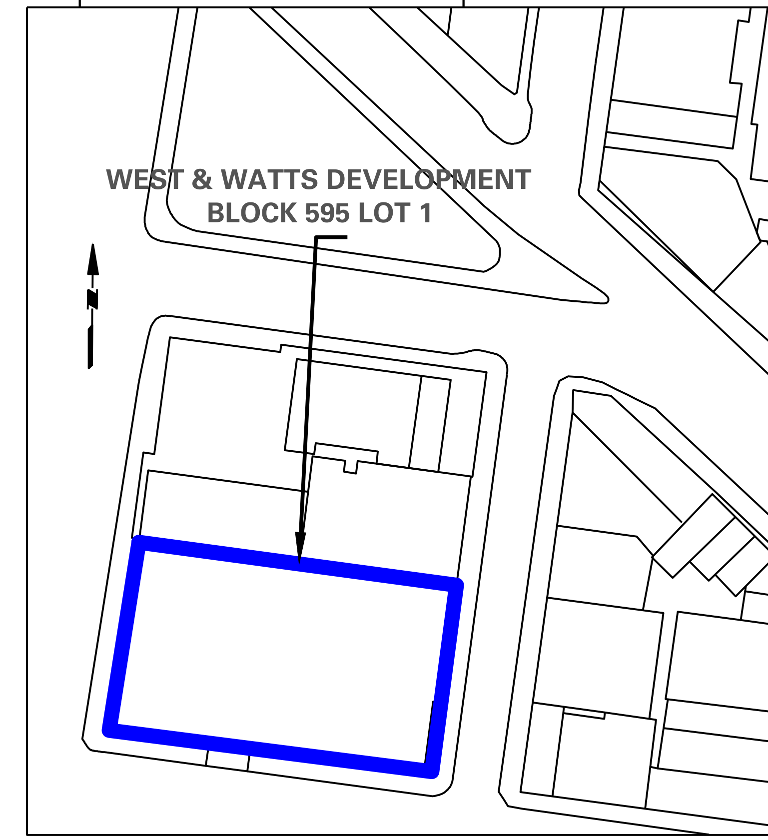
WEST AND WATTS DEVELOPMENT

BLOCK No. 595, LOT No. 1
NEW YORK
NEW YORK NEW YORK

SITE LOCATION PLAN

Project No. 170167502	Drawing No. 1
Date 01/17/13	
Scale NTS	
Drawn By JPD	
Submission Date 01/17/13	Sheet 1 of 9





SITE LAYOUT
N.T.S

LEGEND

SITE BOUNDARY

NOTES
1. SITE LAYOUT BASE MAP OBTAINED FROM NEW YORK STATE OFFICE OF ENVIRONMENTAL REMEDIATION SEARCHABLE PROPERTY ENVIRONMENTAL E-DATABASE.

60 0 20 40 60
SCALE IN FEET

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan International LLC
Collectively known as Langan

Project
WEST & WATTS DEVELOPMENT
460 WASHINGTON STREET
NEW YORK **NEW YORK**

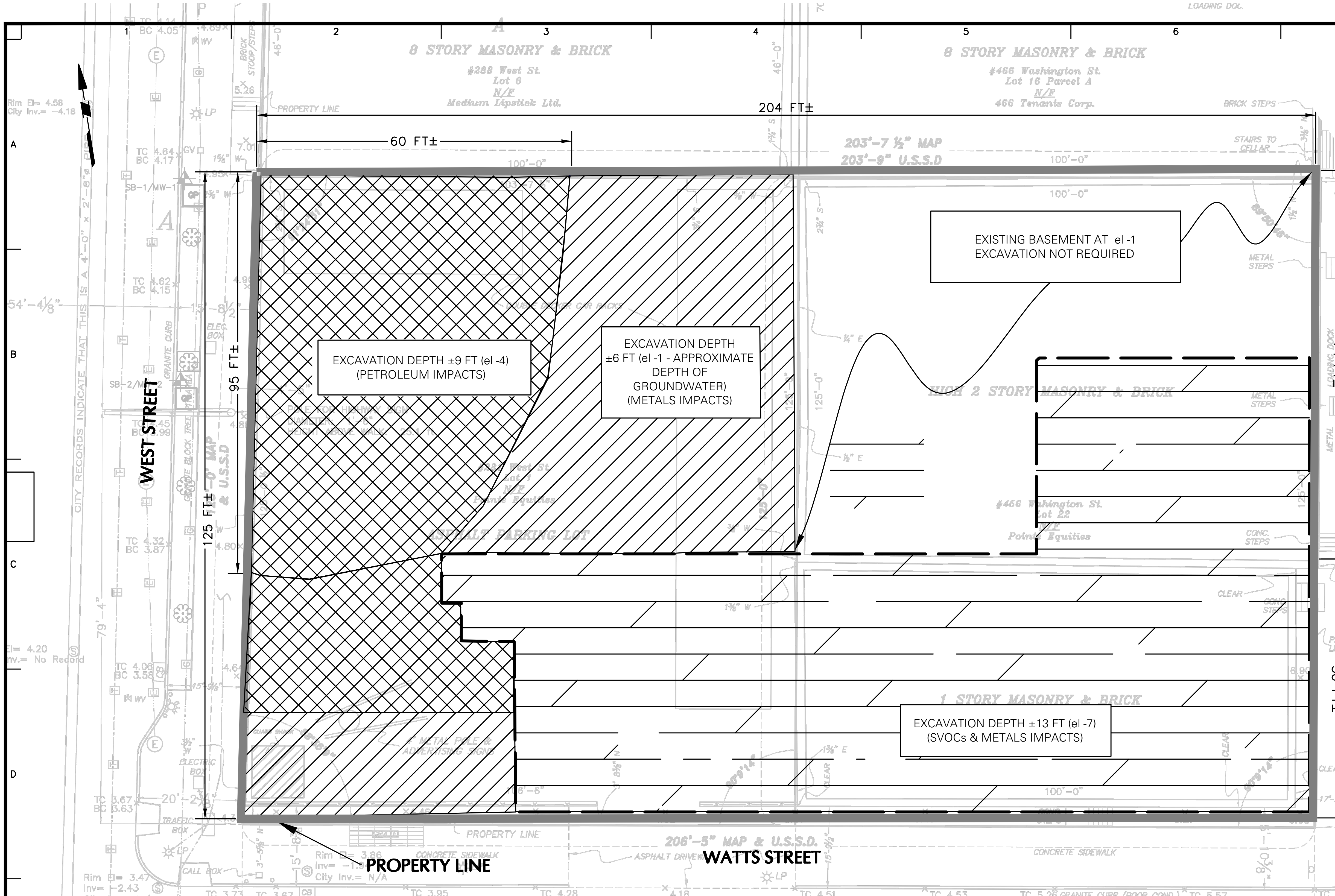
Drawing Title
SITE LAYOUT MAP

Project No. 170167504
Date 1/15/2014
Scale 1"=50'
Drawn By JL
Submission Date X

Drawing No.
2

Sheet 2 of 8

Filename: \\langan.com\data\NY\data5\170167504\Cadd Data - 170167504\2D-DesignFiles\FER\Figure 2 - Site Layout Map.dwg Date: 7/15/2014 Time: 10:00 User: jarmstrong Style Table: Langan.stb Layout: ANSIB-BL



LEGEND

- EXTENT OF EXCAVATION OF PETROLEUM-IMPACTED FILL
- EXTENT OF METAL EXCAVATION OUTSIDE BASEMENT FOOTPRINT
- EXTENT OF METAL AND SVOC EXCAVATION WITHIN PROPOSED BASEMENT FOOTPRINT
- PROPERTY BOUNDARY
- BASEMENT OUTLINE

GENERAL NOTES

1. BASE MAP TAKEN FROM MANHATTAN-SURVEYING'S ARCHITECTURAL SURVEY, DATED 22 SEPTEMBER 2011, REVISED 21 NOVEMBER 2011.
2. AFTER REACHING ELEVATION -1.7 (APPROXIMATE DEPTH OF THE FOOTING ON THE NORTHERN ADJOINING BUILDING), THE PETROLEUM EXCAVATION WAS SET BACK A MINIMUM OF 4 FEET FROM THE BUILDING TO NOT COMPROMISE THE STRUCTURE.
3. NOTED ELEVATIONS ARE RELATIVE TO BOROUGH OF MANHATTAN DATUM, WHICH IS 2.75 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK, NEW JERSEY, 1929 UNITED STATES GEOLOGICAL SURVEY (USGS) NATIONAL GEODETIC VERTICAL DATUM (NGVD)

20 0 5 10 20

SCALE IN FEET

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
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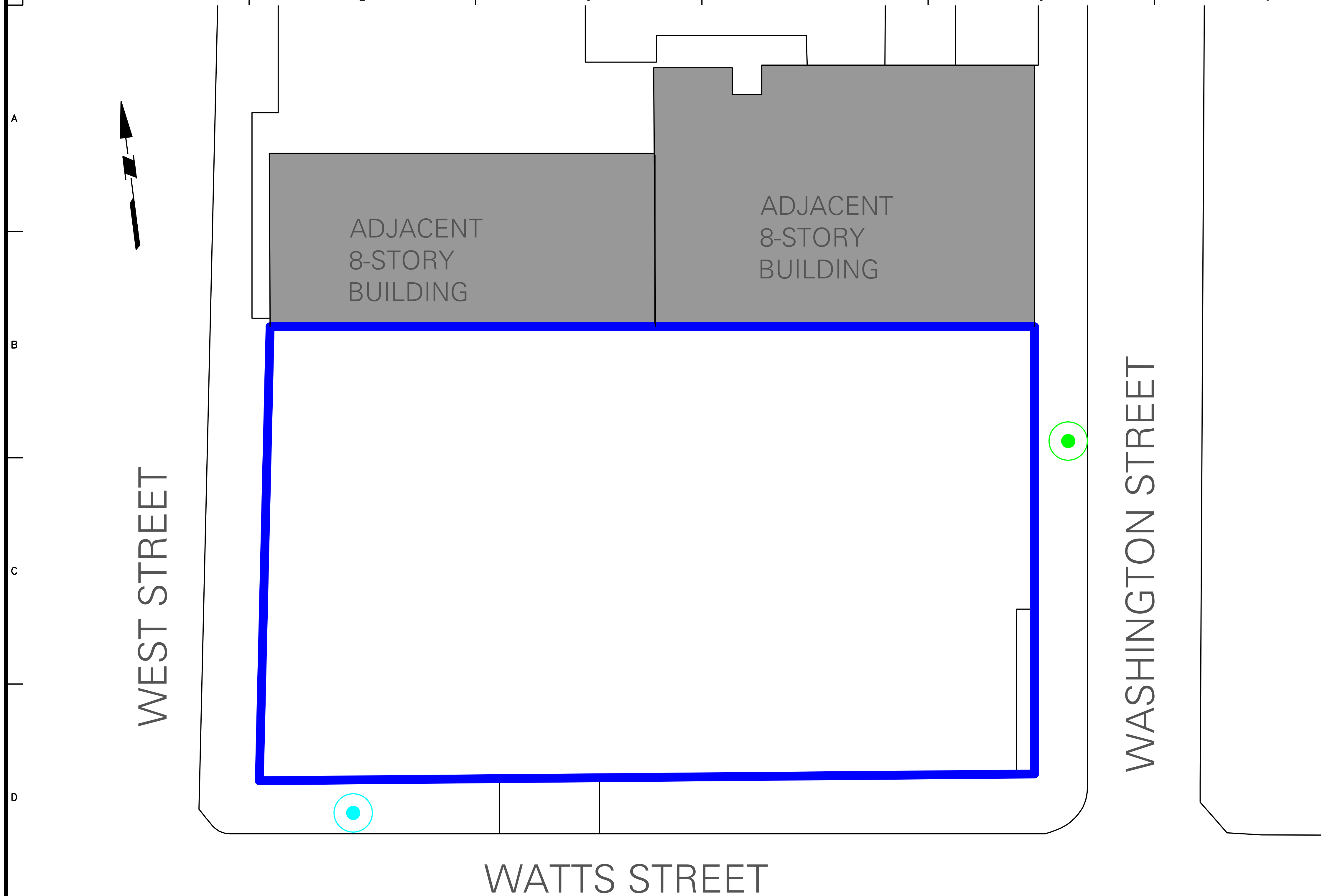
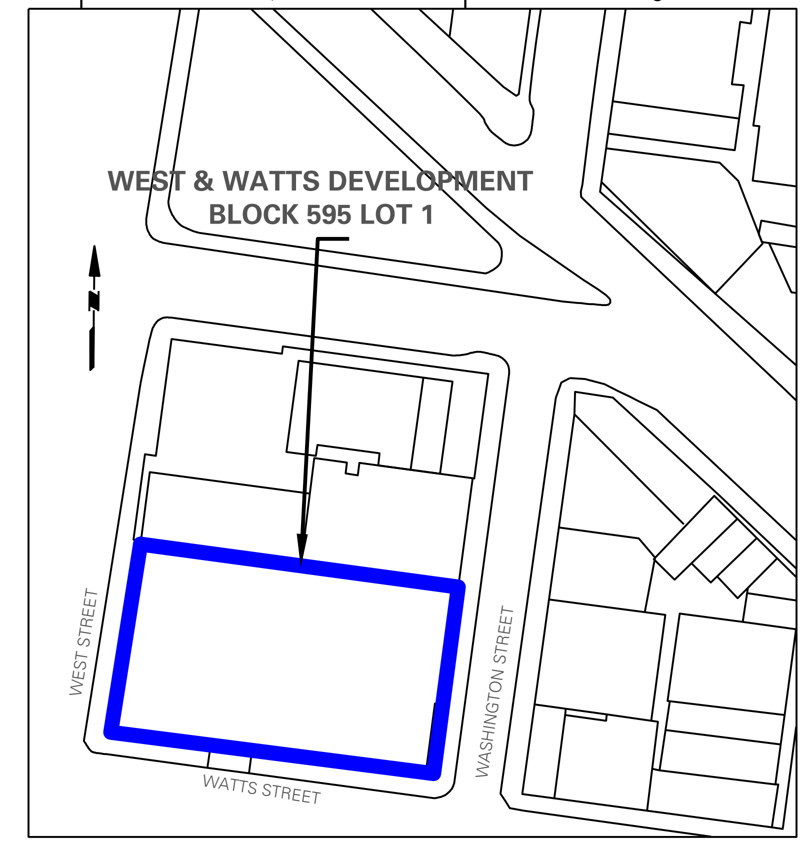
Project: WEST & WATTS DEVELOPMENT, 460 WASHINGTON STREET, NEW YORK NEW YORK	Drawing Title: EXTENT OF EXCAVATION MAP	Project No. 170167504	Drawing No. 3
		Date 1/13/2014	
		Scale 1"=20'	
		Drawn By JL	
		Submission Date X	Sheet 3 of 8





SITE LAYOUT
N.T.S

LEGEND

SITE BOUNDARY

UPWIND MONITORING STATION

DOWNWIND MONITORING STATION

NOTES
1. SITE LAYOUT BASE MAP OBTAINED FROM NEW YORK STATE OFFICE OF ENVIRONMENTAL REMEDIATION SEARCHABLE PROPERTY ENVIRONMENTAL E-DATABASE.

60 0 20 40 60
SCALE IN FEET

LANGAN
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T: 212.479.5400 F: 212.479.5444 www.langan.com

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Collectively known as Langan

Project
WEST & WATTS DEVELOPMENT
460 WASHINGTON STREET
NEW YORK **NEW YORK**

Drawing Title
AIR MONITORING STATION LOCATION MAP

Project No. 170167504
Date 1/15/2014
Scale 1"=50'
Drawn By JL
Submission Date X

Drawing No.
4
Sheet 4 of 8

Sample ID	DS_03
Elevation (feet)	-1
Sampling Date	10/29/2013
VOCs (mg/kg)	
Total VOCs	ND
SVOCs (mg/kg)	
Benzo(a)pyrene	1.38
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Mercury	7.08

Sample ID	DS_04	
Elevation (feet)	-1	
Sampling Date	10/29/2013	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)pyrene	3.84	J
PCBs (mg/kg)		
Total PCBs	ND	
Metals (mg/kg)		
Mercury	5.10	

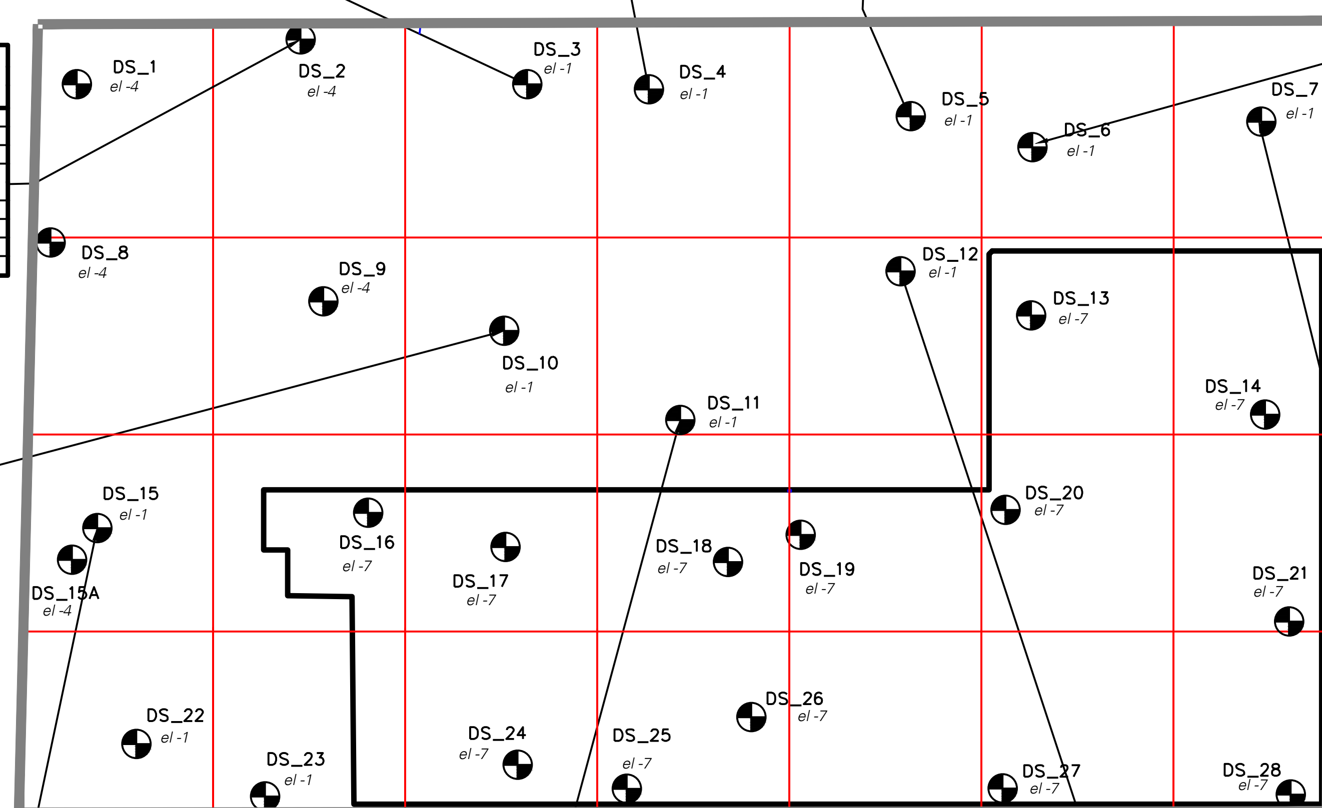
Sample ID	DS_05
Elevation (feet)	-1
Sampling Date	7/16/2013
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Benzo(a)anthracene	52.3
Benzo(a)pyrene	62.4
Benzo(b)fluoranthene	25.7
Chrysene	57.0
Dibenzo(a,h)anthracene	4.67
Indeno(1,2,3-cd)pyrene	9.02
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Total Metals	NE

Sample ID	DUP_2		DS_02	
Elevation (feet)	-4		-4	
Sampling Date	12/9/2013		12/9/2013	
VOCs (mg/kg)				
Total VOCs	NE		NE	
SVOCs (mg/kg)				
Benzo(a)pyrene	1.04	D	3.33	D
Dibenzo(a,h)anthracene	NE		0.676	D
PCBs (mg/kg)				
Total PCBs	ND		ND	
Metals (mg/kg)				
Total Metals	NE		NE	

Sample ID	DS_06
Elevation (feet)	-1
Sampling Date	7/16/2013
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Benzo(a)anthracene	11.4
Benzo(a)pyrene	4.56
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Total Metals	NE

Sample ID	DS_10	
Elevation (feet)	-1	
Sampling Date	10/29/2013	
VOCs (mg/kg)		
Total VOCs	ND	
SVOCs (mg/kg)		
Benzo(a)anthracene	8.28	
Benzo(a)pyrene	9.09	
Benzo(b)fluoranthene	7.00	
Dibenzo(a,h)anthracene	2.45	J
PCBs (mg/kg)		
Total PCBs	NE	
Metals (mg/kg)		
Barium	434	
Lead	1590	
Mercury	3.34	

Sample ID	DS_07
Elevation (feet)	-1
Sampling Date	7/16/2013
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Benzo(a)anthracene	6.29
Benzo(a)pyrene	2.88
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Total Metals	NE



Sample ID	DS_15
Elevation (feet)	-1
Sampling Date	11/5/2013
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Benzo(a)pyrene	1.71
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Mercury	5.08

Sample ID	DS_11	
Elevation (feet)	-1	
Sampling Date	11/5/2013	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)pyrene	1.07	J
PCBs (mg/kg)		
Total PCBs	ND	
Metals (mg/kg)		
Mercury	5.32	

Sample ID	DS_12
Elevation (feet)	-1
Sampling Date	7/16/2013
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Benzo(a)anthracene	29.8
Benzo(a)pyrene	10.9
Benzo(b)fluoranthene	14.0
PCBs (mg/kg)	
Total PCBs	ND
Metals (mg/kg)	
Total Metals	NE

LEGEND

DILUTION

PROPERTY BOUNDARY

BASEMENT EXTENTS

DOCUMENTATION SAMPLE GRID LINE

DS_01 el -4 — EXCAVATION DOCUMENTATION SOIL SAMPLE. SURVEYED ELEVATION OF SAMPLE IS INDICATED IN ITALICS.

NOTES

1. SURVEYED LOCATIONS BASED ON THE MANHATTAN BOROUGH DATUM
2. BASE MAP TAKEN FROM MANHATTAN-SURVEYING'S ARCHITECTURAL SURVEY, DATED 22 SEPTEMBER 2011, REVISED 21 NOVEMBER 2011.
3. DOCUMENTATION SAMPLE, DS_15 WAS RETAKEN AT A LOWER ELEVATION AND NAMED DS_15A.
4. DOCUMENTATION SAMPLE RESULTS WERE COMPARED TO THE TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVES (SCO). ONLY RESULTS EXCEEDING THE SCO ARE SHOWN.
5. ONLY CONCENTRATIONS EXCEEDING TRACK 4 SITE-SPECIFIC SCO ARE SHOWN.
6. NOTED ELEVATIONS ARE RELATIVE TO BOROUGH OF MANHATTAN DATUM, WHICH IS 2.75 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK, NEW JERSEY, 1929 UNITED STATE GEOLOGICAL SURVEY (USGS) NATIONAL GEODETIC VERTICAL DATUM (NGVD, 1929).
7. NE = NO EXCEEDANCES
8. ND = NO DETECTIONS
9. mg/kg = MILLIGRAM PER KILOGRAM
10. VOC = VOLATILE ORGANIC COMPOUND
11. SVOC = SEMI-VOLATILE ORGANIC COMPOUND
12. J = ANALYTE DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT BUT BELOW THE REPORTING LIMIT - DATA IS ESTIMATED
13. D = RESULT IS FROM ANALYSIS THAT REQUIRED A

Track 4 Site Specific SCOs	
SVOCs (mg/kg)	
Benzo(a)anthracene	5.6
Benzo(a)pyrene	1
Benzo(b)fluoranthene	5.6
Chrysene	56
Dibenzo(a,h)anthracene	0.56
Indeno(1,2,3-cd)pyrene	5.6
Metals (mg/kg)	
Barium	400
Lead	1000
Mercury	2.8

30 0 15 30

SCALE IN FEET

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21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
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Project

WEST & WATTS DEVELOPMENT

460 WASHINGTON STREET

NEW YORK **NEW YORK**

Drawing Title

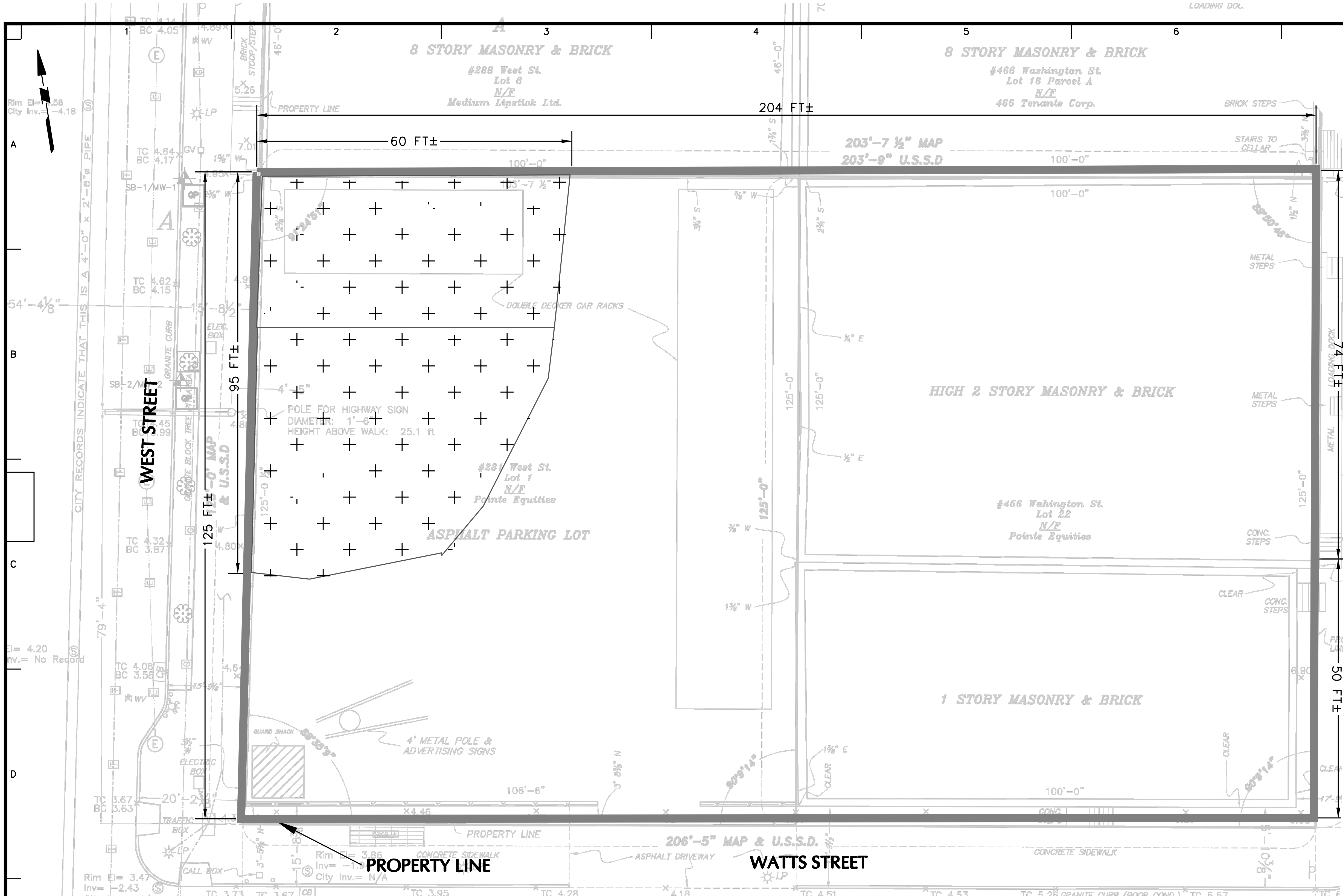
DOCUMENTATION SOIL SAMPLE EXCEEDANCES MAP

Project No.	170167504
Date	1/29/2014
Scale	1:30
Drawn By	JL
Submission Date	

Drawing No.

5

Filename: \\langan.com\data\NY\data5\170167504\Cadd Data - 170167504\2D-DesignFiles\FER\Figure 5 - Documentation Sample Tag Map.dwg Date: 7/15/2014 Time: 10:17 User: jarmstrong Style Table: Langan.stb Layout: ANSIB-BL (1)



LEGEND

PROPERTY BOUNDARY

APPROXIMATE EXTENT OF OXYGEN RELEASE COMPOUND (ORC) APPLICATION

GENERAL NOTES

1. BASE MAP TAKEN FROM MANHATTAN-SURVEYING'S ARCHITECTURAL SURVEY, DATED 22 SEPTEMBER 2011, REVISED 21 NOVEMBER 2011.
2. AFTER REACHING ELEVATION -1.7 (APPROXIMATE DEPTH OF THE FOOTING ON THE NORTHERN ADJOINING BUILDING), THE PETROLEUM EXCAVATION WAS SET BACK A MINIMUM OF 4 FEET FROM THE BUILDING TO NOT COMPROMISE THE STRUCTURE

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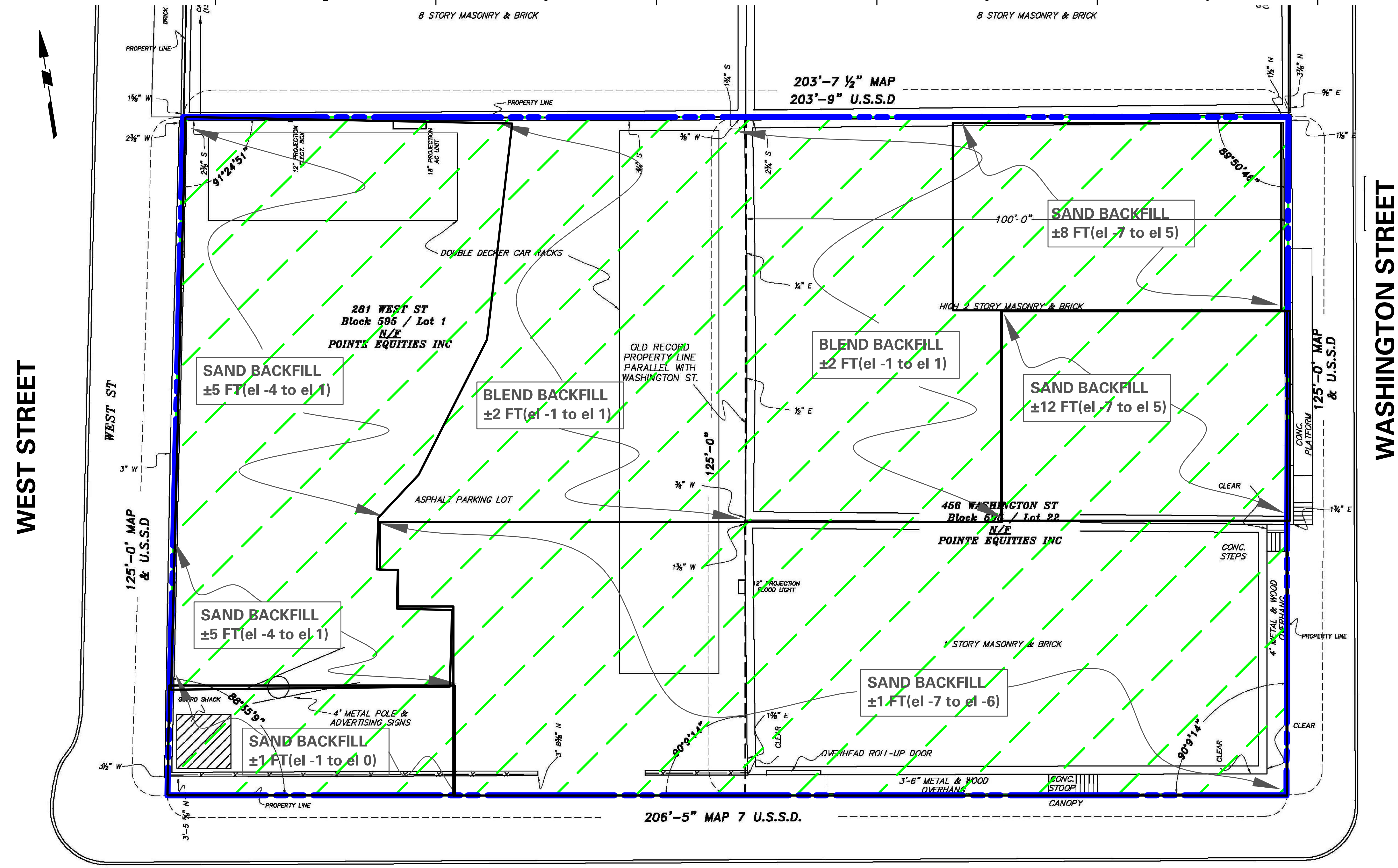
Project	Drawing Title	Project No. 170167504	Drawing No.
WEST & WATTS DEVELOPMENT 460 WASHINGTON STREET NEW YORK NEW YORK	ORC APPLICATION LAYOUT MAP	Date 1/20/2014 Scale 1"=20' Drawn By JL Submission Date X	6 Sheet 6 of 9



WATTS ST
(64'-0" WIDE)

SURVEY NOTES:
1. SOUTH PROPERTY LINE ESTABLISHED BY RECORD DOCUMENTS AND FIELD LOCATIONS.
2. TITLE SURVEY SUBJECT TO FINDING THAT CURRENT TITLE SEARCH MAY REVEAL.

LEGEND:

SITE BOUNDARY

BACKFILLED AREA

NOTES:

1. SURVEY MAP PREPARED BY MANHATTAN-SURVEYING AND DATED JULY 26, 2011.
2. BACKFILL MATERIAL USED WAS EITHER SAND OR BLEND BACKFILL THAT MET RESTRICTED RESIDENTIAL SOIL CLEANUP OBJECTIVES OR "VIRGIN" CRUSHED STONE.
3. NOTED ELEVATIONS ARE RELATIVE TO BOROUGH OF MANHATTAN DATUM, WHICH IS 2.75 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK, NEW JERSEY, 1929 UNITED STATES GEOLOGICAL SURVEY (USGS) NATIONAL GEODETIC VERTICAL DATUM (NGVD)

20' 0 10' 20'
SCALE IN FEET

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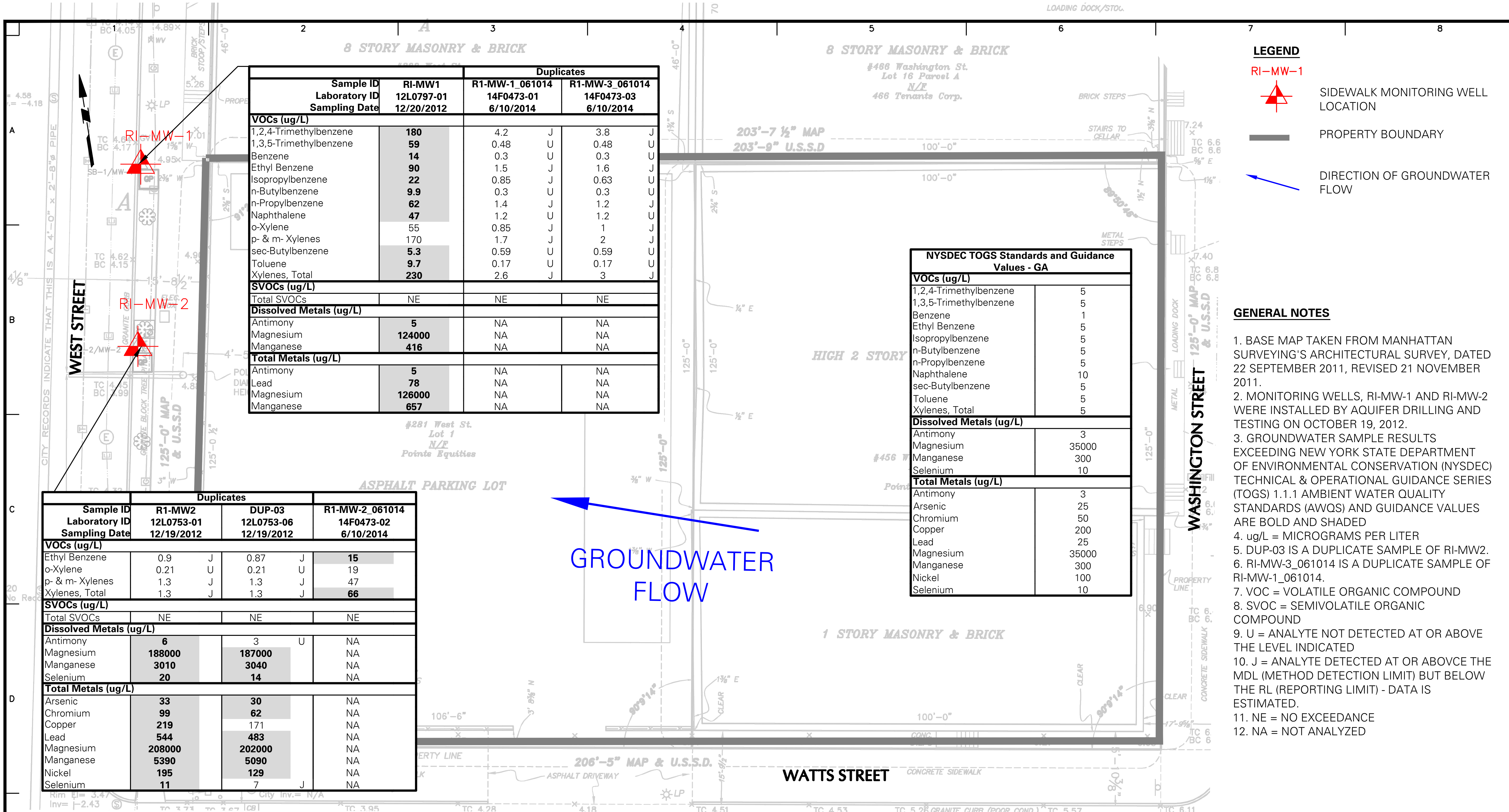
Project	Drawing Title	Project No.	Drawing No.
WEST & WATTS DEVELOPMENT 460 WASHINGTON STREET NEW YORK NEW YORK	BACKFILL AREA LOCATION MAP	170167504	7
		Date 1/22/2014	
		Scale 1"=20'	
		Drawn By JL	
		Submission Date X	Sheet 7 of 8

Filename: \\langan.com\data\NY\data5\170167504\Cadd Data - 170167504\2D-DesignFiles\FER\Figure 7 - Backfilled Areas.dwg Date: 7/15/2014 Time: 13:40 User: jarmstrong Style Table: Langan.stb Layout: ANSIB-BL



Sample ID Laboratory ID Sampling Date	RI-MW1 12L0797-01 12/20/2012	Duplicates R1-MW-1_061014 14F0473-01 6/10/2014		R1-MW-3_061014 14F0473-03 6/10/2014	
VOCs (ug/L)					
1,2,4-Trimethylbenzene	**180**	4.2	J	3.8	J
1,3,5-Trimethylbenzene	**59**	0.48	U	0.48	U
Benzene	**14**	0.3	U	0.3	U
Ethyl Benzene	**90**	1.5	J	1.6	J
Isopropylbenzene	**22**	0.85	J	0.63	U
n-Butylbenzene	**9.9**	0.3	U	0.3	U
n-Propylbenzene	**62**	1.4	J	1.2	J
Naphthalene	**47**	1.2	U	1.2	U
o-Xylene	55	0.85	J	1	J
p- & m- Xylenes	170	1.7	J	2	J
sec-Butylbenzene	**5.3**	0.59	U	0.59	U
Toluene	**9.7**	0.17	U	0.17	U
Xylenes, Total	**230**	2.6	J	3	J
SVOCs (ug/L)					
Total SVOCs	NE	NE		NE	
Dissolved Metals (ug/L)					
Antimony	**5**	NA		NA	
Magnesium	**124000**	NA		NA	
Manganese	**416**	NA		NA	
Total Metals (ug/L)					
Antimony	**5**	NA		NA	
Lead	**78**	NA		NA	
Magnesium	**126000**	NA		NA	
Manganese	**657**	NA		NA	

Sample ID Laboratory ID Sampling Date	Duplicates R1-MW2 12L0753-01 12/19/2012		DUP-03 12L0753-06 12/19/2012		R1-MW-2_061014 14F0473-02 6/10/2014
VOCs (ug/L)					
Ethyl Benzene	0.9	J	0.87	J	**15**
o-Xylene	0.21	U	0.21	U	19
p- & m- Xylenes	1.3	J	1.3	J	47
Xylenes, Total	1.3	J	1.3	J	**66**
SVOCs (ug/L)					
Total SVOCs	NE		NE		NE
Dissolved Metals (ug/L)					
Antimony	**6**		3	U	NA
Magnesium	**188000**		**187000**		NA
Manganese	**3010**		**3040**		NA
Selenium	**20**		**14**		NA
Total Metals (ug/L)					
Arsenic	**33**		**30**		NA
Chromium	**99**		**62**		NA
Copper	**219**		171		NA
Lead	**544**		**483**		NA
Magnesium	**208000**		**202000**		NA
Manganese	**5390**		**5090**		NA
Nickel	**195**		**129**		NA
Selenium	**11**		7	J	NA

NYSDEC TOGS Standards and Guidance Values - GA	
VOCs (ug/L)	
1,2,4-Trimethylbenzene	5
1,3,5-Trimethylbenzene	5
Benzene	1
Ethyl Benzene	5
Isopropylbenzene	5
n-Butylbenzene	5
n-Propylbenzene	5
Naphthalene	10
sec-Butylbenzene	5
Toluene	5
Xylenes, Total	5
Dissolved Metals (ug/L)	
Antimony	3
Magnesium	35000
Manganese	300
Selenium	10
Total Metals (ug/L)	
Antimony	3
Arsenic	25
Chromium	50
Copper	200
Lead	25
Magnesium	35000
Manganese	300
Nickel	100
Selenium	10

LEGEND

RI-MW-1 SIDEWALK MONITORING WELL LOCATION

PROPERTY BOUNDARY

DIRECTION OF GROUNDWATER FLOW

GENERAL NOTES

1. BASE MAP TAKEN FROM MANHATTAN SURVEYING'S ARCHITECTURAL SURVEY, DATED 22 SEPTEMBER 2011, REVISED 21 NOVEMBER 2011.
2. MONITORING WELLS, RI-MW-1 AND RI-MW-2 WERE INSTALLED BY AQUIFER DRILLING AND TESTING ON OCTOBER 19, 2012.
3. GROUNDWATER SAMPLE RESULTS EXCEEDING NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL & OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS (AWQS) AND GUIDANCE VALUES ARE BOLD AND SHADED
4. ug/L = MICROGRAMS PER LITER
5. DUP-03 IS A DUPLICATE SAMPLE OF RI-MW2.
6. RI-MW-3_061014 IS A DUPLICATE SAMPLE OF RI-MW-1_061014.
7. VOC = VOLATILE ORGANIC COMPOUND
8. SVOC = SEMIVOLATILE ORGANIC COMPOUND
9. U = ANALYTE NOT DETECTED AT OR ABOVE THE LEVEL INDICATED
10. J = ANALYTE DETECTED AT OR ABOVCE THE MDL (METHOD DETECTION LIMIT) BUT BELOW THE RL (REPORTING LIMIT) - DATA IS ESTIMATED.
11. NE = NO EXCEEDANCE
12. NA = NOT ANALYZED

20 0 5 10 20
SCALE IN FEET

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Project
WEST & WATTS DEVELOPMENT
460 WASHINGTON STREET
NEW YORK NEW YORK

Drawing Title
PRE- AND POST-REMEDIATION GROUNDWATER SAMPLING RESULTS MAP

Project No. 170167504
Date 6/23/2014
Scale 1"=20'
Drawn By JL
Submission Date X
Drawing No. 8
Sheet 8 of 8