Excavation Management Plan for Handling Regulated Soil and Groundwater for the New Jersey-New York Expansion Project

May 2012

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

Spectra Energy Corp ("Spectra Energy") is proposing to expand its pipeline systems in the New Jersey-New York region to meet the immediate and future demand for natural gas in the largest United States ("U.S.") metropolitan area. To accomplish this, Spectra Energy pipeline companies, Texas Eastern Transmission, LP ("Texas Eastern") and Algonquin Gas Transmission, LLC ("Algonquin") have jointly filed an application for Certificates of Public Convenience and Necessity ("Certificates") from the Federal Energy Regulatory Commission ("FERC"). Texas Eastern and Algonquin (collectively referred to as the "Applicants") are requesting authorization to construct and operate the New Jersey-New York Expansion Project ("NJ-NY Project" or "Project") to expand their existing pipeline systems located in New Jersey, New York, and Connecticut under Section 7(c) of the Natural Gas Act ("NGA"); and to abandon certain facilities under Section 7(b) of the NGA. Refer to Figure 1-1 for Project an overview map that shows the location of all proposed facilities and their association with the Applicants' existing pipeline facilities.

The Applicants have conducted extensive research into the condition of soil and groundwater likely to be encountered along the NJ-NY Expansion pipeline route and reviewed files for over 250 sites in the cities of Linden, Bayonne and Jersey City, New Jersey and in the boroughs of Staten Island and Manhattan, New York. Based on this file review, Applicants have created a comprehensive database, including graphical representations of critical environmental parameters.

A large portion of the NJ-NY Expansion pipeline route, especially in the cities of Bayonne and Jersey City, will cross areas of "historic fill", which is a heterogeneous mixture that can contain reworked soil, construction debris, brick, glass, wood, coal, coal ash, coal cinders, industrial residues (such as metal slag), and other anthropogenic debris. Texas Eastern expects that much of the soil generated during excavation and pipeline installation will be slightly contaminated, particularly with the metals and polycyclic aromatic hydrocarbons that are contained in coal and coal waste. Other types of contamination could include petroleum contamination of soil and groundwater near former and existing refining and storage facilities, and metal slag used for fill.

Due to the industrial history of the area, the land and groundwater have been impacted with a broad suite of contaminants. The contaminants that may be present along the pipeline facilities include:

- Volatile organic compounds ("VOCs") – including those present in petroleum products (such as benzene, toluene, ethylbenzene and xylenes) and chlorinated solvents (such as trichloroethene, tetrachloroethene, and trichloroethane);
- Polycyclicaromatic hydrocarbons ("PAHs")– typically found in petroleum fuels, asphalt and coal;
- Pure petroleum products including gasoline, fuel oil and other liquids and tars;
- Polychlorinated biphenyls ("PCBs");
- Pesticides; and
- Metals including but not limited to lead, arsenic, cadmium, and chromium.

In addition to the chemicals associated with past and present industrial practices, the material that was used to fill in wetland areas often contained contaminants due to the use of coal cinders and ash, construction debris, and other waste materials as fill. Typical contaminants associated with this "historic fill" include PAHs and metals. Several properties in Bayonne and Jersey City have been filled with the residue from the refining of chromate ore in the early 20th century. These properties present additional concerns with respect to potential exposure to hexavalent chromium and other associated metals.

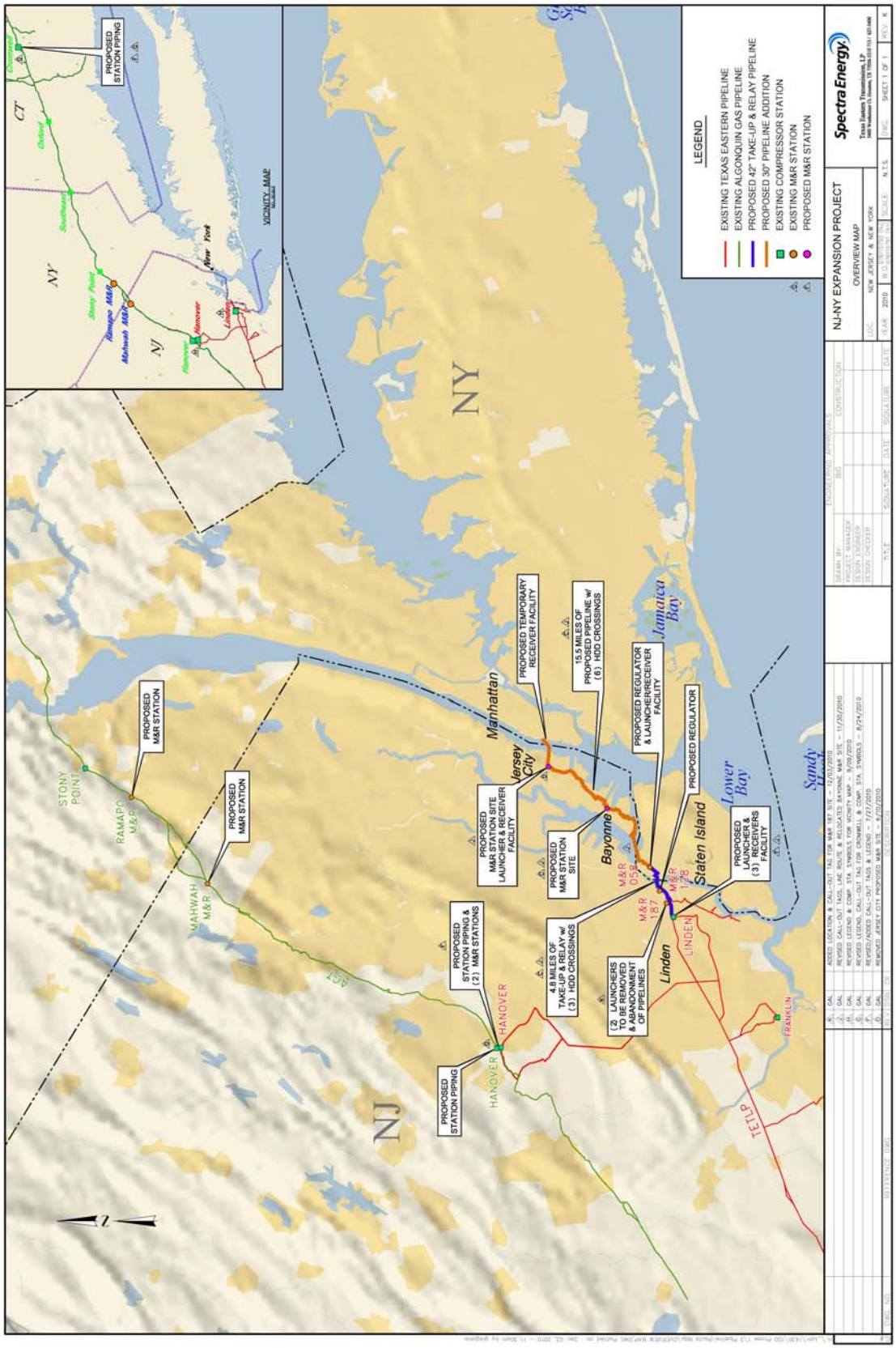

Figure 1-1. Project Overview Map

The Applicants have developed this Excavation Management Plan ("EMP" or "Plan") for Handling Regulated Soil and Groundwater. This EMP will be submitted to the New York State Department of Environmental Conservation ("NYSDEC") for their review and consultation. The New Jersey Department of Environmental Protection ("NJDEP") will not review this EMP. Instead, in accordance with NJDEP's Draft Linear Construction Projects Guidance, the Applicants will retain a Licensed Site Remediation Professional ("LSRP") to review this document and oversee the management of contamination encountered during this project. Soils and groundwater generated during pipeline trench excavation, installation of aboveground facilities along the pipeline, including the work at the Texas Eastern Hanover Compressor Station, will be managed in accordance with this Plan. A Final Linear Construction Report will be prepared for the entire project. In addition to the comprehensive Report for the entire project, this report will be subdivided into two smaller reports describing the portions of the project in New Jersey and New York separately. The New York portion of the report will be submitted to the NYSDEC for their review and files. The New Jersey portion of the report will be submitted to the NJDEP and maintained by the Project LSRP in his records.

This EMP was prepared following NJDEP Technical Requirements for Site Remediation ("TRSR") N.J.A.C. 7:26E, the NJDEP Alternative and Clean Fill Guidance for SRP ("Site Remediation Program") Sites(December 2011), the NJDEP Linear Construction Technical Guidelines (January 21012) and the NYSDEC (6 NYCRR Part 375 and DER-10) regulations and guidance documents.

1.1 Objectives, Specification Plans and Schedules

Objective: The objective of this EMP is consistent with the general provisions set forth by the NJDEP (TRSR N.J.A.C. 7:26E) and the NYSDEC (6 NYCRR 375 and DER-10). The EMP was prepared to provide a defined set of procedures to be employed when contaminated soil and groundwater are encountered during pipeline construction activities. It also serves as a proactive mechanism for gaining regulatory input on management procedures for contaminated material as well as a means for communicating the responsibilities of the parties involved in the construction of the pipeline and related facilities.

Conformance and compliance with the provisions of NJDEP and NYSDEC regulations and guidelines will be achieved through the implementation of Project specific, and site-specific, soil management, groundwater management and health and safety plans. The Groundwater Management Plan ("GMP") is included as Appendix A, and the Soil Management Plan ("SMP") is included as Appendix B.

Key components of the EMP include:

- Soil management procedures;
- Dewatering fluid management procedures;
- Health and safety procedures;
- Compliance with federal and state codes and standards; and
- Emergency response procedures.

1.2 Data Review and Characterization Program

Applicants have reviewed publicly available files for more than 250 known contaminated sites along the proposed pipeline route. These files were obtained from the NJDEP, the NYSDEC, the New York City Department of Environmental Protection ("NYCDEP"), and the U.S. Environmental Protection Agency ("USEPA")-Region 2. The information obtained from these files has been compiled in an interactive

database that has provided the Applicants with an initial understanding of the types and magnitude of soil and groundwater contamination along the proposed route. It is anticipated that a considerable portion of the soil and groundwater encountered will contain contaminants at concentrations above New Jersey and New York acceptable standards and guidelines. A summary of the information obtained from the file reviews is presented in Tables 1 and 2 in Appendix C.

The Applicants are currently performing a pre-characterization boring program to verify the locations and extent of petroleum impacts and potentially hazardous materials along the proposed pipeline route, and to characterize the soil and groundwater along the route for proper disposal. Applicants anticipate completion of the majority of the pre-characterization program by the start of construction in June 2012. Soil borings drilled as part of this program are being advanced along the route at locations selected based on evaluation of the afore-mentioned database, and at locations where data is absent. At these borings, the earth and fill materials penetrated are being described physically in boring logs, and soil samples are being collected for chemical analysis. At selected borings, temporary monitoring wells have been installed. Groundwater samples have been collected from these temporary wells to provide data regarding groundwater quality, and short-term pumping tests have been performed to provide data regarding the hydraulic properties of the soils below the water table. These hydraulic data will be used to estimate the rate of groundwater inflow to the trench at various sections of the route.

Maps showing pre-characterization sampling locations, and discs containing soil and groundwater analytical data collected as of March 15, 2012, are provided in Appendix D.

The collected soil and groundwater data will be utilized to refine the assumptions and procedures in this EMP. There are portions of the route (e.g., roads, parking lots) where the applicants plan to remove all existing material and fill the excavated trench with imported clean fill of know geotechnical properties, to ensure proper compaction, In these areas, the Applicants are supplementing the pre-characterization data is being supplemented through the advancement of more closely spaced borings and the collection of additional soil samples for waste classification purposes. The Applicants are in close communication with several regional licensed disposal and beneficial re-use facilities that can accept the different materials likely to be encountered, and are in the process of procuring pre-approvals for disposal of the soils that will be generated from specific portions of the alignment. The sample frequencies and analytical parameters vary, depending on the anticipated receiving facilities' permit requirements. In areas where free and residual product has been detected during the pre-characterization program, a similar effort is underway to collect additional waste classification samples so that pre-approvals for disposal of this material can be obtained.

The pre-characterization and waste-classification data have identified areas where the soils will be characterized as Resource Conservation and Recovery Act ("RCRA") hazardous waste, s and facilities permitted to accept these materials have been identified; these materials will be transported, handled and disposed in accordance with applicable federal and state laws and regulations..

The remaining soils will be handled in accordance with all applicable state and federal regulations. For example, in New Jersey, the NJDEP Linear Construction Technical Guidance allows contaminated material to be replaced directly back into the excavation in the same location from which it came except when free or residual product is present. This NJDEP Guidance recommends that 6 inches of clean fill or other suitable capping material (asphalt or concrete) be placed at the surface to prevent direct contact exposure with contaminated soil. More stringent requirements apply to chromium contamination. The NYSDEC similarly allows historic fill materials with low-level contamination to be placed back in the excavation from which it was derived. The NYSDEC has indicated that contaminated material placed back in an excavation must be capped with 1-foot of clean soil or other material in industrial and commercial areas. Clean fill is defined in New York State as fill that has been tested at a frequency

defined in NYSDEC DER-10 Table5.4(e)10 and found not to contain concentrations of compounds exceeding corresponding 6 NYCRR Part 375 SCOs. In New Jersey, certified clean fill is defined in the NJDEP Alternate and Clean Fill Guidance for SRP Sites (December 2011). Management of soil and groundwater contaminated with oil and/or hazardous materials encountered during construction activities along the NJ-NY Expansion Project pipeline route will be performed under one continuous EMP, consistent with NJDEP and NYSDEC regulations and guidelines. While this EMP focuses on information obtained regarding known sites, it has also been structured to address unknown areas where contaminated soil and/or groundwater may be encountered.

In the event that significant environmental concerns are encountered (such as free-flowing petroleum product, noxious vapors, explosive conditions and other hazards), these conditions will be addressed using the procedures outlined in the Immediate Response Plan (Appendix E).

2.0 PIPELINE CONSTRUCTION METHODS

The Applicants will install the NJ-NY Expansion Pipeline using conventional overland, buried pipeline construction techniques. The sequence of construction activities, described below, is necessary for the installation of a stable, safe, and reliable transmission facility consistent with federal requirements and regulations. Installation of the proposed pipeline will typically be performed as a continuous, assembly-line progression which includes the following activities: clearing (where required), ROW and temporary construction workspace grading, removal or abandonment of existing pipeline (where required), trench excavation, blasting (where required), stringing, bending, welding, nondestructive weld inspection, coating inspection and repair, lowering-in, tie-ins, backfilling, cleaning, hydrostatic testing, and restoration and re-vegetation.

Clearing: Minimal clearing will be required for construction of the NJ-NY Expansion pipeline since existing, cleared roadway, railway, utility ROWs, and other industrial/commercial sites will be used for a significant portion of the construction ROW. Initial clearing operations will include the removal of vegetation within the pipeline ROW and the temporary construction workspace either by mechanical or hand cutting. The limits of clearing will be identified and flagged in the field prior to any clearing operations. In wetlands, trees and brush will either be cut with rubber-tired and/or tracked equipment, or hand-cut. Unless grading is required for safety reasons, wetland vegetation will be cut off at ground level, leaving existing root systems intact, and the aboveground vegetation removed from the wetlands for chipping or disposal, except in wetlands that will be crossed using the horizontal directional drilling ("HDD") method. In uplands, tree stumps and rootstock will be left in the temporary workspace wherever possible to encourage natural revegetation. Stumps will be removed from the ROW to approved disposal locations. Brush and tree limbs will be chipped and removed from the ROW for approved disposal. Wood chips will be sold as fuel or other marketable products, spread in approved locations and used as mulch, or hauled off site for disposal.

Grading: Minimal grading will be required on this Project as the terrain is relatively flat or the work will be in streets and no grading will occur in streets or parking lots. The entire width of the construction ROW, including the temporary construction workspace, will be rough graded as necessary to allow for safe passage of equipment and to prepare a work surface for pipeline installation activities. Typically, the grading of the ROW will be completed with bulldozers. Backhoes will be used in conjunction with bulldozers in areas where boulders and tree stumps require removal. A travel lane or traffic control will be maintained to allow for the passage of daily traffic.

Removal or Abandonment of Existing Pipeline: Approximately 2.4 miles of 12-inch diameter pipeline and 2.3 miles of 20-inch diameter pipeline will be removed. In addition, approximately 3.0 miles of 12-inch diameter pipeline, 0.1 mile of 20-inch diameter pipeline and 0.09 mile of 24-inch diameter pipeline will be abandoned.

Trenching: A trench will be excavated by a backhoe to the proper depth to allow for the burial of the pipe. In general, the trench will be deep enough (approximately 7 feet deep for the 42-inch diameter pipeline and 6 feet deep for the 30-inch diameter pipeline) to provide for a minimum of 3 feet of cover over the pipelines as required by 49 CFR Part 192 of the U.S. Department of Transportation ("USDOT") regulations. Deeper burial may be required in specific areas. The excavated material will be placed next to the trench so as to avoid unnecessary movement of machinery across the terrain. Material appearing to be contaminated will be managed in accordance with the SMP (Appendix B).

Rock may be encountered which is too difficult to excavate with a mechanical backhoe. In these cases, a tractor-mounted tooth or ripper or hydraulic ram may be employed to loosen or break the material. The backhoe will then remove the rock and soil from the trench. In areas underlain with bedrock, portions of the pipeline construction may require controlled blasting to grade the ROW and to excavate the trench. Based on the review of the geologic information in the files for known contaminated sites, it is not anticipated that bedrock will be encountered during pipe installations, but boulders entrained in the glacial till or used for fill may be encountered.

Stringing: Once the trench is excavated, the next process in conventional pipeline construction is stringing the pipe along the trench. Stringing involves initially hauling the pipe by tractor-trailer, generally in 40-foot lengths from the pipe storage yard, onto the ROW. The pipe will be off-loaded from trucks and placed next to the trench using a side boom tractor. The pipe joints are lined up end-to-end to allow for welding into continuous lengths known as strings. However, because much of the Project is in urban areas and will utilize mini-crews, it is anticipated that each crew will have the pipe hauled to the work site daily. Some pipe will be stockpiled on the ROW and will be fenced and stabilized if left over night, but will not be left along the ditch unattended.

Bending: Once the sections of pipe have been placed on the ROW, the pipe is bent as necessary so the pipe fits the horizontal and vertical contours of the excavated trench. The Bending Engineer will survey the trench to determine the location and amount of each field bend. This information is marked on each piece of pipe so that the Bending Foreman can make the appropriate pipe bends. Pipe is usually bent with a hydraulic pipe-bending machine. Pipe bends will be relatively long and gradual, which must be considered when the trench is dug. However, it is likely that bending will be conducted in one of the pipe yards and the bent pipe will be hauled to the ROW. It is not feasible to have a bending machine with each crew for the Project.

Welding: All welding is performed in accordance Texas Eastern's specifications. The individual joints of pipe are welded together in two steps. The front-end welding crew, or pipe gang, will perform the first step. This crew will clean and align the pipe bevels in preparation for welding and place at least the first two passes in the welding process. The firing line, or back-end welders, performs the second step, completing the welds started by the front-end welders.

Nondestructive Weld Inspection: After welding, each weld is inspected by independent experts to ensure its structural integrity is consistent with 49 CFR Part 192 of the USDOT's regulations. Radiographs or ultrasonic images are taken and processed on site for virtually instantaneous results. Those welds that do not meet the requirements established by Texas Eastern's specifications will be repaired or replaced.

Coating Inspection and Repair: The pipeline is coated to prevent corrosion. The pipe lengths will be coated (usually with a heat-applied epoxy) at a coating mill prior to being delivered to the Project. The ends of each piece are left bare to allow for welding. Once welds have been inspected and accepted, the weld area is field coated by the coating crew. Because pipeline coatings are electrically insulating, the coating is inspected using equipment that emits an electric charge to ensure there are no locations on the pipeline where there is a defect in the coating.

Lowering-In: After a pipe string has been coated and inspected, the trench is prepared for the installation of the pipeline. The trench is cleared of loose rock and debris. In sandy soils, the trench is shaped to support the pipe. In areas where the trench contains bedrock, a sand bedding is placed on the bottom of the trench, and/or pads made of sandbags and/or clay are placed at regular intervals along the trench bottom to support the pipe. The lowering-in crew places the pipeline in the trench. Lowering-in is usually done with side boom tractors.

Tie-Ins: Once the sections of pipe are lowered-in, the tie-in crew makes the final welds in the trench. Additional excavations as needed, lowering in, lining up, welding, weld nondestructive inspection and coating the final welds are accomplished by this crew.

Backfilling: All suitable material excavated during trenching will be re-deposited into the trench, except where the pipeline will be installed under roadways and paved parking areas, or where the excavated material contains free or residual petroleum product.. In these locations controlled density fill ("CDF") will be used to backfill the trench. Soil or other material that contains free or residual product will not be used as backfill. Clean fill or other suitable capping material (asphalt or concrete) will be placed at the surface to prevent direct contact exposure. . Where excavated material is unsuitable for backfilling, additional "clean" fill may be required. In New York, clean fill to be used as backfill must be tested at a frequency defined in NYSDEC DER-10 Table5.4(e)10 and found not to contain concentrations of compounds exceeding corresponding 6 NYCRR Part 375 SCOs. In New Jersey, clean fill must meet the testing requirements specified in NJDEP's Alternate and Clean Fill Guidance for SRP Sites document.
Cleaning: Once the pipeline tie-ins are completed, it is internally cleaned with pipeline "pigs." A manifold is installed on one end of the long pipeline section and a pig is propelled by compressed air through the pipeline into an open pig catcher. The purpose is to remove any dirt, water or debris that was inadvertently collected within the pipeline during installation.

Hydrostatic Testing: After cleaning, the pipeline will be pressure tested in accordance with Texas Eastern's requirements to ensure its integrity for the intended service and operating pressures.

Restoration and Revegetation: The cleanup crew completes restoration and revegetation of the ROW and temporary construction workspace. In general, every effort will be made, weather and soil conditions permitting, to complete final cleanup (including final grading) and installation of permanent erosion control measures within 20 days after the trench is backfilled. These restoration activities will be completed in residential areas within 10 days of backfilling. In conjunction with backfilling operations, any woody material and construction debris will be removed from the ROW. The ROW will be fine-graded to prepare for restoration. Fences, sidewalks, driveways, stone walls and other structures will be restored or repaired as necessary.

2.1 Other Construction Methods

Take-up/Relay: Approximately 4.8 miles of the NJ-NY Expansion pipeline will involve replacing removed pipeline with a larger diameter pipeline by the take-up/relay method. This will generally involve excavating a trench to remove the old pipe; backfilling the trench and re-excavating the trench wider and deeper (as appropriate) in order to accommodate the new, larger diameter pipeline; and installing the replacement pipe at approximately the same location as the old pipe using the standard construction methods previously discussed.

Road/Railroad Bores: Roadway crossing construction will generally occur using one of the following methods:

- Open Cut – This method is used on driveways, parking lots, and roads with low traffic densities where pipeline installation activities will not adversely impact the general public. The first step is to install the proper traffic control devices. Traffic will have to be detoured around the open trench during the installation process. The pipeline crossing is installed one lane at a time. As the pipe is installed, successive lanes are alternately taken out of service for pipe installation until the crossing is completed. Another option is to detour traffic around the work area through the use of adjacent roadways.

If the roadway surface is paved, pavement over the proposed trench is cut, removed, and properly disposed. The trench is excavated using a combination of a backhoe and hand shoveling around existing utilities once the ditch is completed and the pipe is installed (welded, radiographed and coated). All existing utilities exposed during excavation will be supported at their existing elevation to avoid damage. Support will be maintained until backfill of the pipeline ditch and the exposed utility are completed. The trench is then backfilled. A 15:1 sand to concrete mix called flowable fill, or CDF, may be used as backfill material for 1 foot over the pipeline. The additional backfill must be compacted properly to reduce stresses on the pipeline and to ensure the roadway supports the traffic load without settling. The existing trench subsoil may be used in the backfill if it can be compacted properly. In those cases where existing trench material is not used, backfill material will be obtained from an outside source and hauled in, in accordance with the applicable state's guidance and regulations. If the roadway surface was paved, the paving will be properly restored in accordance with the permit requirements.

- Bored – On roads with higher traffic densities and for railroads where service must be maintained, the pipeline may be installed by boring a hole under the road or railway. Specialized boring equipment is used. The soil and or rock are bored by a drill that contains a cutting head which cuts through the soil. Dummy casing, which is slightly larger in diameter than the pipeline, may be installed immediately behind the cutting head. An auger is placed inside the pipe to remove the cuttings. The cuttings will be tested and disposed of in accordance with federal, state and local regulations. When completed, the bored hole is slightly larger than the outside diameter of the pipeline to be installed. Once the bore is completed, the pipeline section is welded to the boring pipe and pulled into place as the boring pipe is removed. Any voids between the pipeline and the subsoil are filled with grout (a sand-cement mix) to prevent settlement of the roadway surface or railroad track. This method allows the road or railroad to remain in service while the installation process takes place and eliminates the potential for trench settlement.

- Cased – The procedure for a cased crossing is similar to a bored crossing with one exception. A section of steel casing pipe, which is several inches in diameter greater than the pipeline, is bored into place. Casing sections are welded together to ensure water does not enter the casing. Once the casing pipe has been installed, the pipeline is pulled through the casing. To prevent potential corrosion of the pipeline due to contact between the pipeline and the casing, the pipeline is insulated from the casing pipe, usually the pipeline is coated with a layer of concrete. To prevent water from entering the casing, the ends of the casing are sealed with rubber or polyethylene seals. The space between the casing and the pipeline is vented to the atmosphere through the use of sections of small diameter pipe (vent pipe), which are welded to the casing ends and run from the casing to several feet above the surface of the ground.

  Casing pipe is installed when required by permit or when there is a likelihood of encountering rock during the boring. Generally, crossings of major federal and state highways and certain railroads are installed with casings.

- Hammer technique – In addition to the boring techniques described above, pipeline contractors sometimes use another technique to complete road crossings. This technique consists of driving casing pipe that is slightly larger in diameter than the proposed pipeline under the roadway with a horizontal air operated reciprocating hammer. The casing pipe is placed against the end of the trench near the edge of the roadway and driven under the paved road. Once in place, the material inside the casing is augured out and the pipe is installed through the casing. The casing pipe is then removed while grout is placed around the pipeline. Where required, the casing pipe may be left in place as casing.

- In-Street Construction – The first step for this method is to install the proper traffic control devices. Traffic will have to be detoured or directed around the construction area during the installation process. The working area along any street will be limited to areas designated in state and municipal road opening permits, expected to be 400 to 600 feet long. All construction activities will be limited to this section, and this work area will move along the street as construction advances. Pavement over the proposed trench is cut, removed, and properly disposed in accordance with federal, state and local regulations. The trench is excavated using a combination of backhoe and hand shovel digging around existing utilities. Once completed and the pipe is installed (welded, radiographed, and coated). All existing utilities exposed during excavation will be supported at their existing elevation to avoid damage. Support will be maintained until backfill of the pipeline ditch and the exposed utility are completed.

  Excavation of the trench will proceed ahead of pipe installation to provide the contractor information regarding the existing utilities that will have to be crossed and to make vertical or horizontal adjustments in the alignment of the pipeline. The trench is then backfilled. No trench will be left unprotected over night as the trench will be backfilled or plated to ensure public safety. CDF will be used to fill the trench to one foot over the pipe. The backfill must be compacted properly to reduce stresses on the pipeline and to ensure the roadway supports the traffic load without settling. The existing trench subsoil may be used in the backfill if it can be compacted properly, is non-hazardous, does not contain free product, and is authorized by the permitting agency. In those cases where existing trench material is not used, backfill material will be obtained from an outside source and hauled in. Any backfill obtained from an off-site source must be tested in accordance with NJDEP's Fill Guidance at SRP Sites document to determine whether it can be used as backfill in New Jersey or the NYSDEC DER-10 Table5.4(e)10, 6 and NYCRR Part 375 SCOs in New York. The material used and methods of placement will comply with the requirements of the permitting agency which includes the Alternate and Clean Fill Guidance for SRP Sites in New Jersey or the NYSDEC DER-10 Table5.4(e)10, 6 and NYCRR Part 375 SCOs in New York. If the roadway surface was paved, the paving will be properly restored in accordance with the permit requirements.

2.2 Waterbody Construction Methods

Horizontal Directional Drilling ("HDD"): HDD is a trenchless installation process that uses equipment and techniques derived from oil well drilling technology. The installation is a multi-stage process consisting of establishing a small diameter pilot hole along the crossing profile, followed by enlargement of the pilot hole to accommodate pull back of the proposed pipeline.

Dry Stream Crossings - Dam and Pump or Flumed: Dry stream crossings are designed to route the water within a stream around the work area to provide a dry working environment. There are two types of dry crossings: dam and pump and the flumed crossing.

The dam and pump involves the installation of upstream and downstream dams (typically sandbags). Once the dams are installed, pump(s) are used to provide downstream flow of water around the construction work area. The rate of pumping should be monitored to minimize draining of the intake sump and the resulting cessation in flow. Alternatively, pumping should be monitored and increased as necessary to prevent overtopping of the dams. The flumed crossing also uses upstream and downstream dams; however, a flume/culvert is used to convey stream flow across the work area instead of pumps and hoses.

In order to mitigate potential migration of contaminants or free product along preferential pathways created by the pipeline and backfill material, impervious seals will be installed within the pipeline trench at specific locations along the installed pipeline. Decisions regarding which areas along the pipeline route will require these seals will be made based on the data gathered in file reviews, characterization sampling data, field screening results and field observations. Also considered will be depth to groundwater at a given location with respect to the depth of the pipeline and groundwater quality data gathered during reviews of available historical information and pre-characterization data.

2.3 Waste Management

As described in the GMP (Appendix A) and SMP (Appendix B), the Contractor has specific requirements for handling these media. These plans were written to conform to requirements of the NJDEP and the NYSDEC regulations.

It is anticipated that the dewatering fluids generated during dewatering activities will be discharged to surface water (the nearest storm sewer or water body), to groundwater or to tanker trucks for transport to a permitted facility. If necessary, the water will be treated and discharged in compliance with discharge permits that will be obtained from the NJDEP and NYSDEC. Specific dewatering guidelines are contained in the GMP in Appendix A. All excavated materials will be field screened, segregated, and stockpiled (on polyethylene sheeting, if warranted), or in dump trucks or roll offs. Field screening will consist of visual inspection for the presence of free product, use of a photoionization detector ("PID") to detect for the presence of organic vapors, and olfactory screening for the presence of noxious odors. During backfilling activities, excavated materials that can be reused will be placed in the trench. Excess soils will be transported to pre-approved disposal facilities, or to temporary staging areas where soils will be characterized for proper disposal. In New Jersey, once the soil is removed to a temporary staging area, it may not be re-used within the pipeline corridor as backfill unless it is tested in accordance with the NJDEP Fill Guidance at SRP Sites document. Soils that are not reused will be disposed of in accordance with applicable federal and state regulations. The specific procedures for soil management are provided in the SMP in Appendix B.

3.0 REPORTING

Field summary reports will be prepared on a daily basis during EMP activities. The daily field reports will provide the basis for preparation of the EMP Completion Report, which will be prepared after the pipeline has been installed and all excavation, backfilling and restoration work is complete. At a minimum, daily field reports will include the following:

- Status of response actions;
- Any significant new site information or data;
- Information regarding management of excavation waste, dewatering fluids generated during dewatering, and remedial activities;
- Detailed information including location and testing information.
- Field monitoring data required per the Groundwater Management, Soil Management and the Project's Health and Safety Plans; and
- Field monitoring data for any remedial systems that may be employed at a given location. At a minimum, the EMP Completion Report will include the following:
    - Techniques used to manage regulated material to protect adjoining properties and workers and visitors to the Project Limits against exposure to regulated material and to prevent release of regulated material to the environment.
    - Standard operating procedures for excavation, stockpiling, transporting, measurement, and disposal of regulated material.
    - Receiving facility certification and permits.
    - Licensed hauler qualifications.
    - Waste characterization forms.
    - The sampling and analysis protocol used for characterizing the regulated material for "clean fill", on-site reuse (including receiving site analytical data) and off-site disposal.
    - Receiving facility requirements for accepting the regulated material.
    - Documentation of the management of regulated material, including the location and dates of excavation, stockpiling, sampling, off-site management (Bill of Lading and Hazardous Waste Manifests), and on-site placement of regulated material. Include plans depicting the exact location of placement of regulated material.
    - Sampling logs, chain of custody and analytical reports for soil and groundwater,
    - Sampling logs for the water collection, monitoring and handling activities (groundwater treatment systems).

4.0 REFERENCES

NYSDEC Department of Environmental Remediation Technical Guidance for Site Investigation and Remediation ("DER-10") May 3, 2010.

New York State Groundwater Quality Standards – 6 NYCRR Part 703, August 4, 1999.

NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations – Technical and Operational Guidance Series ("TOGS") 1.1.1 June 1998, last updated 2004.

6 New York Code of Rules and Regulations ("NYCRR") Part 375, December 14, 2006.

Title 6, New York Code of Rules and Regulations ("NYCRR") Part 750 et seq., also known as the State Pollutant Discharge Elimination System (SPDES) regulations.

New York State Standards and Specifications for Erosion and Sediment Control, August 2005.

New York State Stormwater Management Design Manual, August 2010.

New Jersey Department of Environmental Protection - *Field Sampling Procedures Manual*, August 2005.

New Jersey Department of Environmental Protection – N.J.A.C. 7:14A "New Jersey Pollutant Discharge Elimination System (NJPDES) Rules." 10. New Jersey Department of Environmental Protection – N.J.A.C. 7:26C "Administrative Requirements for the Remediation of Contaminated Sites," April 2010.11. New Jersey Department of Environmental Protection – N.J.A.C. 7:26D "Remediation Standards," November 2009.

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New Jersey Department of Environmental Protection - Fill Guidance at SRP Sites, August 11, 2011.

APPENDIX A

GROUNDWATER MANAGEMENT PLAN

TABLE OF CONTENTS

1.0 INTRODUCTION

The Applicants has submitted applications for permits to the New Jersey Department of Environmental Protection ("NJDEP") and the New York State Department of Environmental Conservation ("NYSDEC") to discharge fluids generated from the dewatering of excavated trenches. Based on the range of chemical constituents identified during the Applicants pre-characterization program, Applicants contractors will retain licensed operators and treatment equipment capable of meeting applicable discharge standards.

In New Jersey, the Applicants applied for two types of permits: 1) to discharge treated water to surface water bodies and wetlands, and 2) to discharge treated water onto the ground or into injection wells or pits. Separate applications for permits have been submitted in each of the three New Jersey municipalities transected by the NJ-NY Expansion Project (Linden, Bayonne and Jersey City). Specifically, three applications have been submitted for General Permit Authorization ("GPA") under Surface Water BGR – General Remediation Cleanup, NJPDES Permit NJG 0199893 to allow for the temporary discharge of treated dewatering effluents to surface water bodies and wetlands. These permits will allow the discharge of treated effluents to specific discharge locations identified in each GPA. The treatment limits in effect will be the limits set in State-wide Surface Water BGR – General Remediation Cleanup, NJPDES Permit NJG 0199893.

The Applicants have also applied for New Jersey Pollution Discharge Elimination System ("NJPDES")-Discharge to Groundwater ("DGW") Permits in the same three municipalities to allow for the discharge of potentially contaminated dewatering effluents onto the ground in the near vicinity of the excavation. The NJPDES-DGW Permits will require less treatment, and will be "monitor only" permits and will not have effluent limits set.

In New York, the Applicants have been issued a Draft State Pollution Discharge Elimination System ("SPDES") Permit that will allow the discharge of treated dewatering effluents to specific locations identified in the permit in Staten Island and Manhattan. The Draft SPDES Permit sets discharge limits for a select group of parameters.

This Groundwater Management Plan ("GMP") has been prepared to address contaminated groundwater that may be encountered during dewatering activities conducted as part of the construction of the NJ-NY Expansion Project to ensure compliance with the discharge permits described above. Management of contaminated groundwater will be performed under this GMP. This GMP is one component of a comprehensive Excavation Management Plan ("EMP") that will govern the management of all waste materials generated during construction of the Project. The EMP and associated GMP were prepared following NJDEP, NYSDEC, Clean Water Act and Municipal Sewer Use regulations and guidance.

Management of contaminated groundwater encountered during construction activities along the NJ-NY Expansion Project pipeline route will be performed under one continuous EMP in accordance with NJDEP and NYSDEC regulations and guidelines. This GMP is designed to address contaminants known to exist at sites identified in the EMP, and the contaminants identified during the pre-characterization program, and it is sufficiently comprehensive to address unknown areas where contaminated groundwater may be encountered. The environmental activities including, trench dewatering, treatment and/or discharge, must be performed in accordance the discharge permits described above, and with other applicable federal and state regulations and guidelines.

The objectives of this GMP are to:

- Ensure consistency during the various phases of construction;
- Limit potential liabilities to the Applicants associated with improper management of contaminated groundwater; and,
- Ensure compliance with State (NJDEP and NYSDEC) discharge permits, and other federal and state regulations, as applicable.

This GMP presents the methodologies and treatment technologies to be implemented by the Applicants' construction contractor ("the Contractor") during the pipeline project. Treatment schemes described in this GMP have been selected to treat the range of known contaminants and meet the limits specified in the permits described above. In specific instances, it may prove necessary to provide additional treatment because of unforeseen types of contamination.

2.0 DEWATERING FLUID DISCHARGE ALTERNATIVES

All liquids to be removed from the site, including excavation dewatering fluids and groundwater monitoring well purge and development waters, will be handled, transported and disposed of in accordance with applicable federal and state regulations. It is anticipated that the dewatering fluids generated during dewatering activities will be discharged to surface water (the nearest storm sewer, water body or wetlands), groundwater, or to tanker trucks for transport to a permitted facility. The water will be treated and discharged in compliance with discharge permits that will be obtained from the NJDEP and the NYSDEC. The discharge locations specified in the GPAs for the Surface Water BGR NJPDES Permit (New Jersey) and the SPDES Permit (New York) are shown in Appendix A.1.

Groundwater in the excavation areas, including Horizontal Directional Drilling ("HDD") entry and exit points and bore pit locations, could be contaminated with free product, VOCs, semi-volatile organic compounds ("SVOCs)", metals and other contaminants. Treatment prior to discharge to surface water, groundwater, or to New York City combined sewers is regulated by the NYSDEC, New York City Department of Environmental Protection ("NYCDEP") and the NJDEP. Depending on the selected discharge option, a NYCDEP sewer use permit may be obtained to discharge treated groundwater to a combined sewer in Manhattan.

A treatment system capable of reducing contaminant levels to the extent needed to satisfy the requirements of the NYCDEP sewer discharge criteria, and the permit limits established in the Surface Water BGR NPDES Permit and the draft SPDES permit will be operated on-site. It is expected that the treatment system will include settling tanks, an oil-water separator, particulate filters, activated carbon units, and other filtration media to remove dissolved metals and emulsified oil, if present. Effluent discharge compliance sampling will be performed in accordance with permit requirements.

In areas in New Jersey where treated effluent will be discharged onto the ground under the NJPDES-DGW Permits, there will be no specific constituent discharge limits, provided the treated water is discharged in the near vicinity to the trench or pit from which it was pumped. The NJPDES-DGW Permit will require sediment filtration and the removal of separate-phase petroleum and other products prior to discharge. In areas where the pre-characterization data indicate high VOC concentrations in groundwater, the NJPDES-DGW Permit may require filtration with activated carbon to reduce VOC concentrations prior to discharge.

If the groundwater infiltration rate is minimal, the potentially contaminated water may be pumped directly to tank trucks or holding tanks that will transport the water to a facility for proper disposal in accordance with federal and state regulations.

3.0 POTENTIAL DISCHARGE CRITERIA

As described in Section 1.0 of this GMP, treated dewatering fluids will be discharged under the Surface Water BGR NJPDES Permit or NJPDES_DGW Permits in New Jersey. In New York, treated dewatering fluids will be discharged under the SPDES Permit or a NYCDEP sewer use permit. The Surface Water BGR NJPDES Permit (New Jersey) and the SPDES Permit (New York) have specific limits for several chemical parameters. When discharging to the surface water discharge locations identified in these permits, the applicable permit limits will be in effect.

The NYCDEP sewer use permit is likely to contain pre-treatment requirements and discharge limits; these limits are not known at the time of this plan's preparation.

In New Jersey, the NJPDES-DGW Permits will not contain specific limits, providing the treated effluent is discharged in the near vicinity of the area from which it was pumped. The NJPDES-DGW Permit will require sediment filtration and the removal of separate-phase petroleum and other products prior to discharge. In areas where the pre-characterization data indicate high VOC concentrations in groundwater, the NJPDES-DGW Permit may require filtration with activated carbon to reduce VOC concentrations prior to discharge.

4.0 PROPOSED TREATMENT

Historical information and the pre-characterization program have identified the contaminants that will be encountered along the project alignment. These contaminants include free-phase petroleum product (and potentially other separate-phase product), dissolved total petroleum hydrocarbons ("TPH"), dissolved petroleum VOCs, dissolved chlorinated solvents, and dissolved metals.

Mobile treatment units will be constructed on flat-bed trucks and set up adjacent to identified surface water discharge locations, or other locations as needed. The units will all be of similar design, so they are interchangeable within the parameters of the applicable permits. The units will all have a maximum flow capacity of 500 gallons per minute ("gpm"). In areas where it will be necessary to treat more than 500 gpm for prolonged durations, two similar treatment systems, each with 500 gpm capacity, will be located near the discharge point.

A conceptual design was incorporated into the draft SPDES Permit in New York, and to support the Surface Water Permit in New Jersey, the Applicants are submitting applications for Treatment Works Approval. The applications will specify the detailed design and provide supporting documentation for treatment system design parameters.

Extracted groundwater from dewatering efforts associated with construction usually contains significant amounts of silt. This material will be removed before subsequent treatment and discharge. Removal is accomplished by the use of both settling fractionation ("frac") tanks and filters.

Free-phase product will be removed in oil water separators that will be positioned before the units designed for dissolved constituent filtration.

Removal of dissolved VOCs and TPH from water will be accomplished by carbon adsorption. The removal of dissolved metals, where necessary to meet discharge requirements, will be accomplished with filtering media (such as greensands) capable of removing dissolved metals. As a polishing step for metals, and for entrained oil that may have bypassed oil/water separators, vessels with organoclay or comparable media will be used where warranted.

4.1 Sampling

Samples of the treated effluent will be collected in accordance with the applicable permits. Each permit has its particular requirements for sampling frequency and analytical parameters. It will be the responsibility of the treatment contractor to collect and analyze the required samples, and ensure permit compliance. The EMP Inspector assigned to each construction crew will document sample collection and other pertinent treatment system information.

4.2 Monitoring and Change-Out

Following settling, the groundwater will be filtered with bag filters to remove any remaining particulates that could clog the downstream equipment. Groundwater from the excavation would first be pumped to an equalization and settling or frac tank, where suspended particulates would be allowed to settle out. Particulates collected in the settling tank will be removed on a regular basis, tested and disposed off-site in accordance with the SMP (*see* Appendix B) and NJDEP or NYSDEC guidelines, depending on site location.

Following the filter bags will be a liquid phase granular activated carbon ("GAC") system consisting of a number of containers of GAC arranged in a parallel/series configuration. The system will consist of several parallel branches of GAC containers. On each parallel branch, at least two GAC containers will be arranged in a series configuration with a sampling port located between them to allow for determination of contaminant breakthrough. Effluent from the GAC system will be discharged in accordance with the selected method (*see* Section 3.0). Spent carbon will be removed from the system and returned to the manufacturer for regeneration, or disposed offsite at an appropriately permitted facility.

Appropriate field screening methods should be used to monitor samples from between each pair of GAC containers to identify breakthrough in the first container. When breakthrough is identified, the first container will be removed, and replaced by the second container. A fresh container will then be placed at the tail of the system.

5.0 RESPONSIBILITIES

The general activities or steps, summarized below, will be followed prior to and during dewatering of each excavation:

Review of Groundwater Management Plan

Prior to beginning dewatering for an excavation in the pipeline construction areas, the Construction Contractor and the Water Treatment Contractor will review this GMP and all applicable discharge permits. They will be provided pre-characterization data and other information for the relevant sections of the construction alignment.

Water Treatment Contractor

The Treatment Contractor will provide all the treatment systems and other necessary equipment, and will provide the licensed operators and other staff to operate the systems in accordance with the applicable permits. The Treatment Contractor's staff will collect the samples required by each applicable permit, and ensure permit compliance. The Treatment Contractor will provide the analytical results to the EMP Inspector when they become available.

EMP Inspector

The EMP Inspector assigned to each construction crew will document the Treatment Contractor's operation of the treatment system and sample collection. The onsite EMP Inspector will compile daily field notes. These notes, with the sampling results provided by the Treatment Contractor, will be incorporated into the Final Linear Construction Report that will be prepared when the project is complete.

Worker Health and Safety

The Contractor will be responsible for preparing and implementing a site-specific Health and Safety Plan in accordance with the minimum requirements of the Applicant's Health and Safety requirements.

Discharge Permist

All appropriate permits, as described in Section 1.0 of this GMP, will be obtained prior to any dewatering activities. The Construction Contractor and Treatment System Contractor must review and be familiar with the appropriate permits and must insure compliance with the permits.

Dewatering System

The Contractor performing the construction excavation, and the Treatment Contractor providing and operating the treatment systems, will be responsible for all phases of the dewatering system, including installation, monitoring, and maintenance. The minimum treatment scheme presented in this GMP should be supplemented if the Contractor determines that additional contaminants require modification of the treatment system.

Sampling

The Contractor and Treatment Contractor are responsible for meeting applicable discharge criteria, including protocol for influent and effluent sampling. Sampling of system influent and effluent should be

performed at the schedule identified in the applicable permits. The Treatment Contractor will ensure that all sampling is conducted in accordance with all applicable permits.

All samples will be collected in laboratory-supplied sample jars approved for each specific method. Appropriate preservatives will be added in the field to assure sample integrity. All metal and PCB samples will be field filtered, followed by appropriate sample preservation, to assure that dissolved contaminant concentrations are being measured.

The Contractor shall maintain records of all procedures and sampling locations. They must adhere to sampling Quality Control ("QC") and Chain-of-Custody record procedures in accordance with NJDEP, NYSDEC and USEPA requirements. They shall submit two copies of all sampling results to the Environmental Project Manager within 1 week after testing.

If the results of the sampling and analysis indicate that applicable discharge criteria have been exceeded, the Contractor shall immediately cease discharge until the exceedance has been rectified. Discharge shall not be continued until analytical results indicate the exceedance no longer exists. The Contractor shall notify the Applicants and the Environmental Project Manager immediately of any such shutdown.

6.0 QUALITY CONTROL/QUALITY ASSURANCE

6.1 Quality Control

Quality Control will be performed by the EMP Inspector on behalf of the Applicants.

Laboratory chemical analyses for evaluation of treatment system influent and effluent will be consistent with applicable permit analytical requirements and discharge criteria.

The detection limits for all chemical tests will be low enough to allow confirmation that applicable discharge criteria are being met. Samples will be collected by the Treatment Contactor from between carbon containers in series at regular intervals determined by the influent concentrations. Field screening using portable gas chromatograph instrumentation will be used on these samples to determine the estimated removal efficiency of the leading carbon container. The leading carbon container will be replaced with the second container when removal efficiency falls below 90 percent. A fresh carbon container will then be added as the second container in series. The spent carbon will be transferred off site for regeneration or disposal. Proper documentation of off-site removal, including all necessary Hazardous Waste Manifests or Bills of Lading, should be provided to the Applicant and the EMP Inspector .

6.2 Quality Assurance

The EMP Inspector, on behalf of the Applicants, will be responsible for quality assurance for the construction dewatering management program. Aspects of the quality assurance component of the construction dewatering management plan are discussed below.

The Treatment Contractor will be required to submit all field observations and monitoring data to the EMP Inspector, who will be responsible for verifying decisions regarding operation, maintenance and sampling of the dewatering treatment system. The Applicant's designated Professional Engineer (P.E.) of record for the Surface Water NJPDES Permit in New Jersey or his designee will maintain a master document of all submittals.

If test results indicate that effluent from the dewatering treatment system is exceeding the applicable discharge standards, discharge from the treatment system will be halted. Sufficient storage capacity may be needed to store untreated water until the treatment system can be brought on line, in order to limit disruption to the pipe installation procedures.

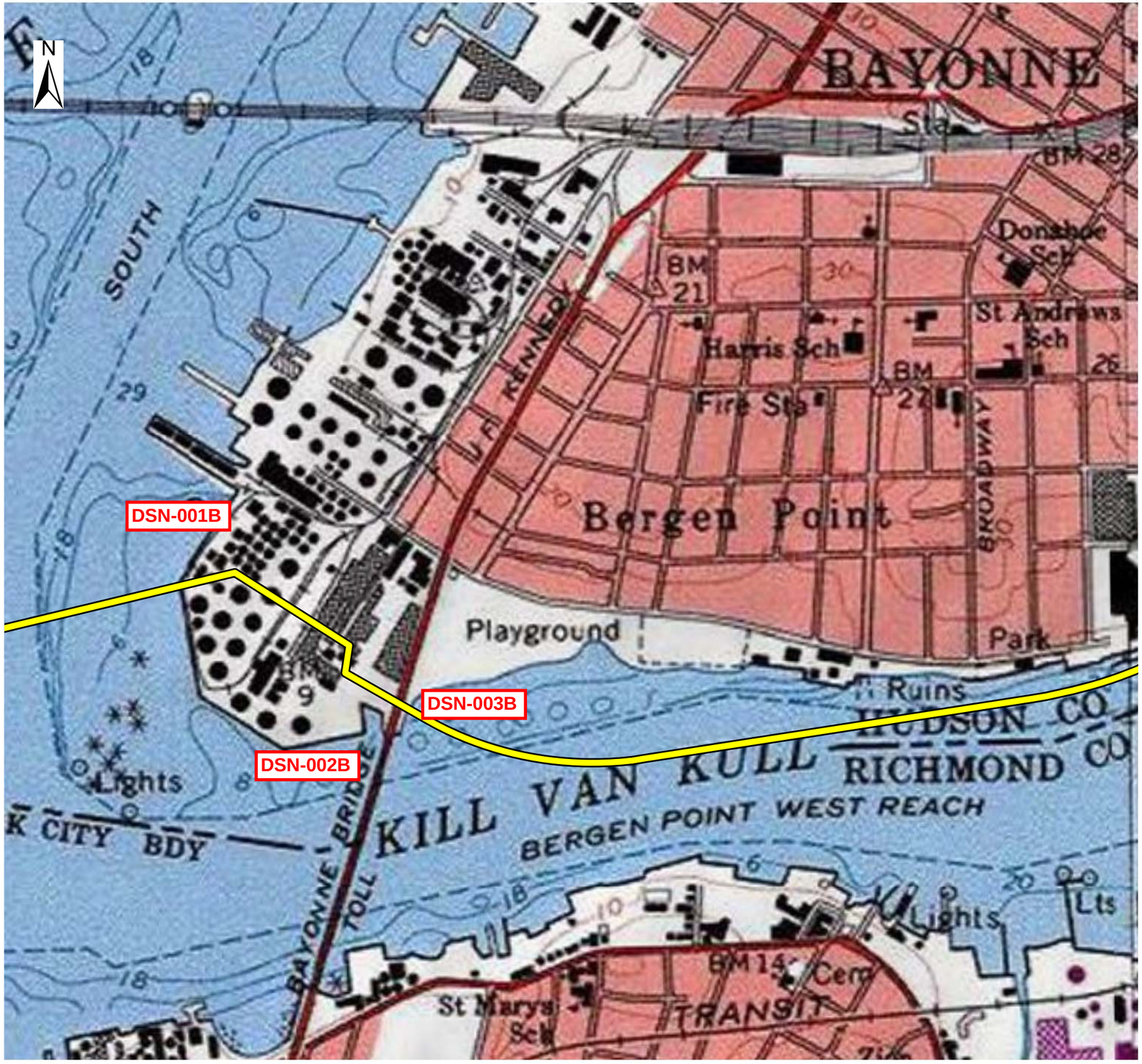
The P.E. of record or his designee will collect duplicate samples of up to 10 percent of the samples used for breakthrough determination in the leading carbon containers. The sampling distribution will be biased to identify "false negatives" (i.e., inadequately treated effluent which may be improperly considered to be below the applicable discharge criteria based on field screening results).

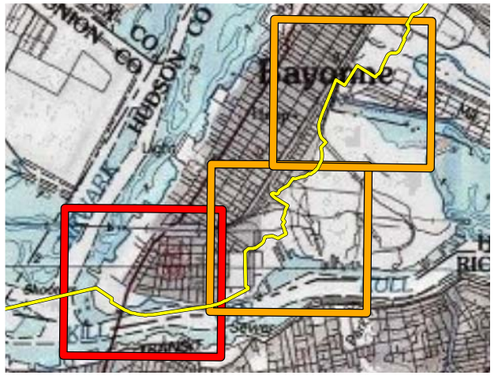
The P.E. of record will compile all data and prepare a package for submittal on behalf of the Applicants to the NJDEP and NYSDEC. The data will be submitted with the Final Linear Construction Report that will be submitted to the NJDEP and NYSDEC after the completion of the Project.

APPENDIX A.1

SURFACE WATER DISCHARGE LOCATIONS

Outfall Locations for Surface Water Discharges in Bayonne, NJ															
Outfall Number	**Latitude**	**Longitude**	**Receiving Media (Surface Water, Wetland, Storm Sewer)**	**Receiving Media Classification**	**Receiving Water Body**	**Receiving Water Body Classification**	**Site Owner Name of Location of Ground Water Trenching**	**Site Address of Location of Ground Water Trenching**	**Freq. in Days/Week**	**Freq. in Avg. Months/Year**	**Flow Rate in Monthly Avg (mgd)**	**Flow Rate Daily Max (mgd)**	**Total Volume Flow for Monthly Avg**	**Total Volume Flow in daily max**	**Duration in Days**	**Discharge Category**
DSN-001B	40° 38' 52.18"	74° 08' 45.79"	Surface Water	SE3	Kill Van Kull	SE3	Texaco Downstream Properties, Inc.	Avenue A & West 1st Street	6	1	1.4	1.4	40.6	1.4	29	
DSN-002B	40° 38' 36.55"	74° 08' 35.14"	Surface Water	SE3	Kill Van Kull	SE3	Texaco Downstream Properties, Inc.	Avenue A & West 1st Street	6	1	1.4	1.4	40.6	1.4	29	
DSN-003B	40° 38' 40.68"	74° 08' 24.63"	Surface Water	SE3	Kill Van Kull	SE3	Texaco Downstream Properties, Inc.	Avenue A & West 1st Street	6	1	1.4	1.4	40.6	1.4	29	
DSN-004B	40° 38' 48.16"	74° 07' 10.52"	Surface Water	SE3	Kill Van Kull	SE3	Bayonne Local Redevelopment Authority	Foot of Ingham Avenue	6	1	0.85	0.85	22.5	0.85	26	
							Duraport Rail Terminal, LLC	Foot of Ingham Avenue								
							City of Bayonne	Foot of Ingham Avenue								
DSN-005B	40° 39' 00.48"	74° 07' 14.18"	Stormwater Catch Basins along Ingham Avenue	SE3	Kill Van Kull	SE3	City of Bayonne	Ingham Avenue	6	1	0.85	0.85	22.5	0.85	26	
DSN-006B	40° 39' 07.08"	74° 06' 59.71"	Surface Water	SE3	Inlet to Kill Van Kull	SE3	City of Bayonne	East of the 5th Street Connection	6	1	1.4	1.4	40.6	1.4	29	
							Bayonne Industries Inc.	Foot of Oak Street								
DSN-007B	40° 39' 09.97"	74° 06' 56.78"	Surface Water	SE3	Inlet to Kill Van Kull	SE3	City of Bayonne	East of the 5th Street Connection	6	1	1.4	1.4	40.6	1.4	29	
							Bayonne Industries Inc.	Foot of Oak Street								
DSN-008B	40° 39' 36.50"	74° 06' 44.41"	Stormwater Catch Basins along Route 440	SE2	Upper New York Bay	SE2	Multiple owners along the north side of Route 440	Multiple addresses along the north side of Route 440	6	2	1.4	1.4	42	1.4	42	
DSN-009B	40° 40' 09.29"	74° 06' 26.23"	Surface Water	SE2	Bayonne Inlet Channel	SE2	99 Hook Rd LLC	99 Hook Rd	6	2	1.4	1.4	42	1.4	40	
DSN-010B	40° 40' 13.05"	74° 06' 23.72"	Surface Water	SE2	Bayonne Inlet Channel	SE2	Bayonne Local Redevelopment Authority	MOTBY	6	1	0.25	0.25	7.3	0.25	29	
DSN-011B	40° 40' 33.88"	74° 05' 55.73"	Wetland	PFO	N/A	N/A	Bayonne Local Redevelopment Authority	Along Pulaski Lane West	6	1	1.0	1.0	29	1.0	29	
DSN-012B	40° 40' 30.84"	74° 05' 44.32"	Surface Water	SE2	Upper New York Bay	SE2	Bayonne Local Redevelopment Authority	Along Pulaski Lane West	6	1	1.0	1.0	29	1.0	29	
DSN-013B	40° 40' 35.17"	74° 05' 41.39"	Surface Water	SE2	Inlet to Upper New York Bay	SE2	Bayonne Local Redevelopment Authority	Along Pulaski Lane West	6	2	1.0	1.0	30	1.0	50	
							Pulaski Street Real Estate, LLC	150 Pulaski Street								
							City of Bayonne	Pulaski Street								
							T.M. Jasme Properties, LLC	20 Pulaski Street								





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Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
BAYONNE, NJ

FIGURE 1

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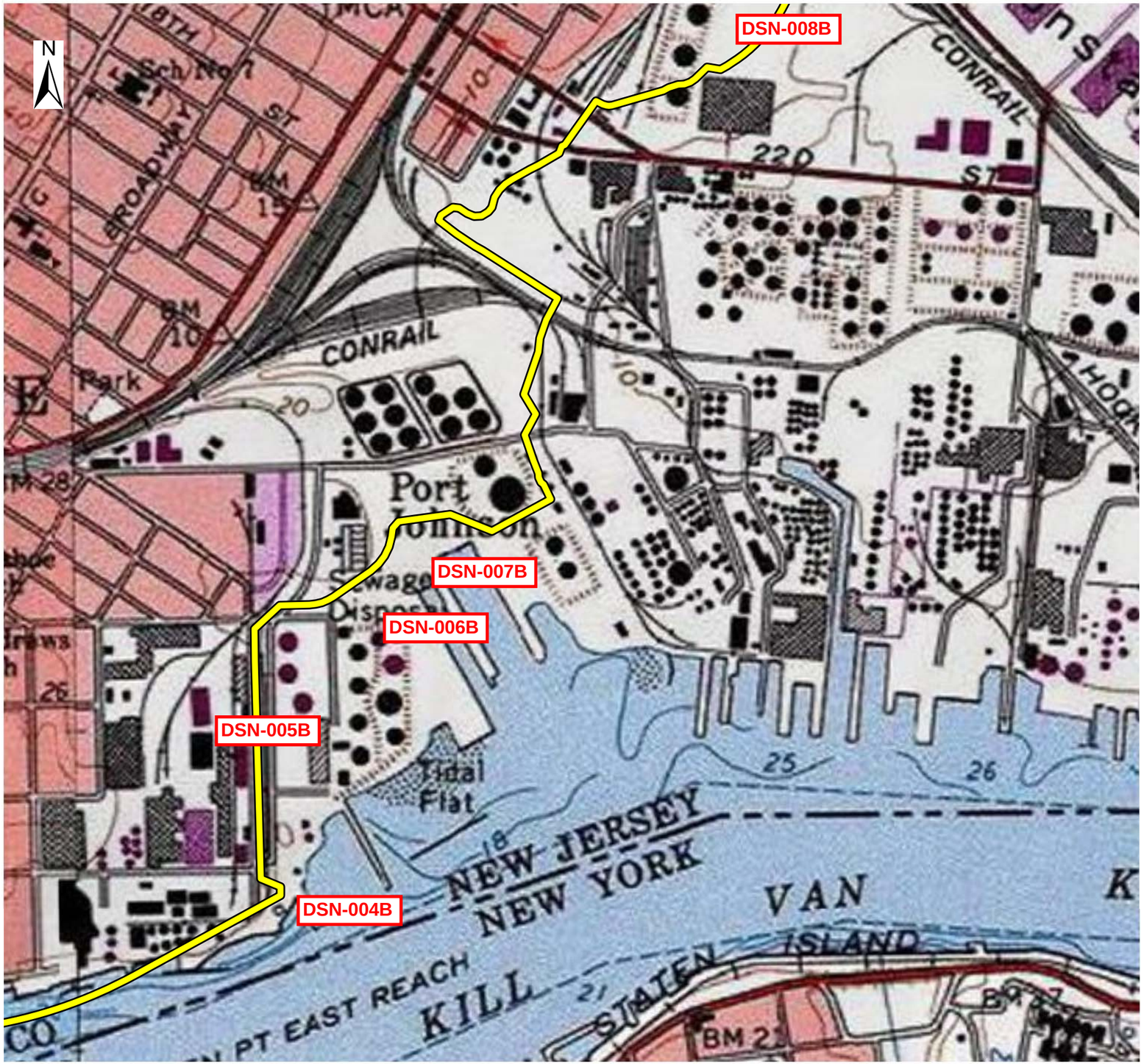

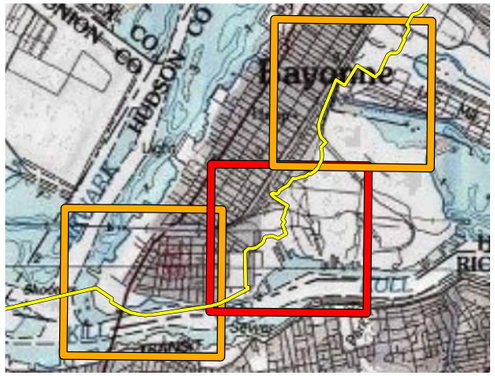

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SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
BAYONNE, NJ

FIGURE 2

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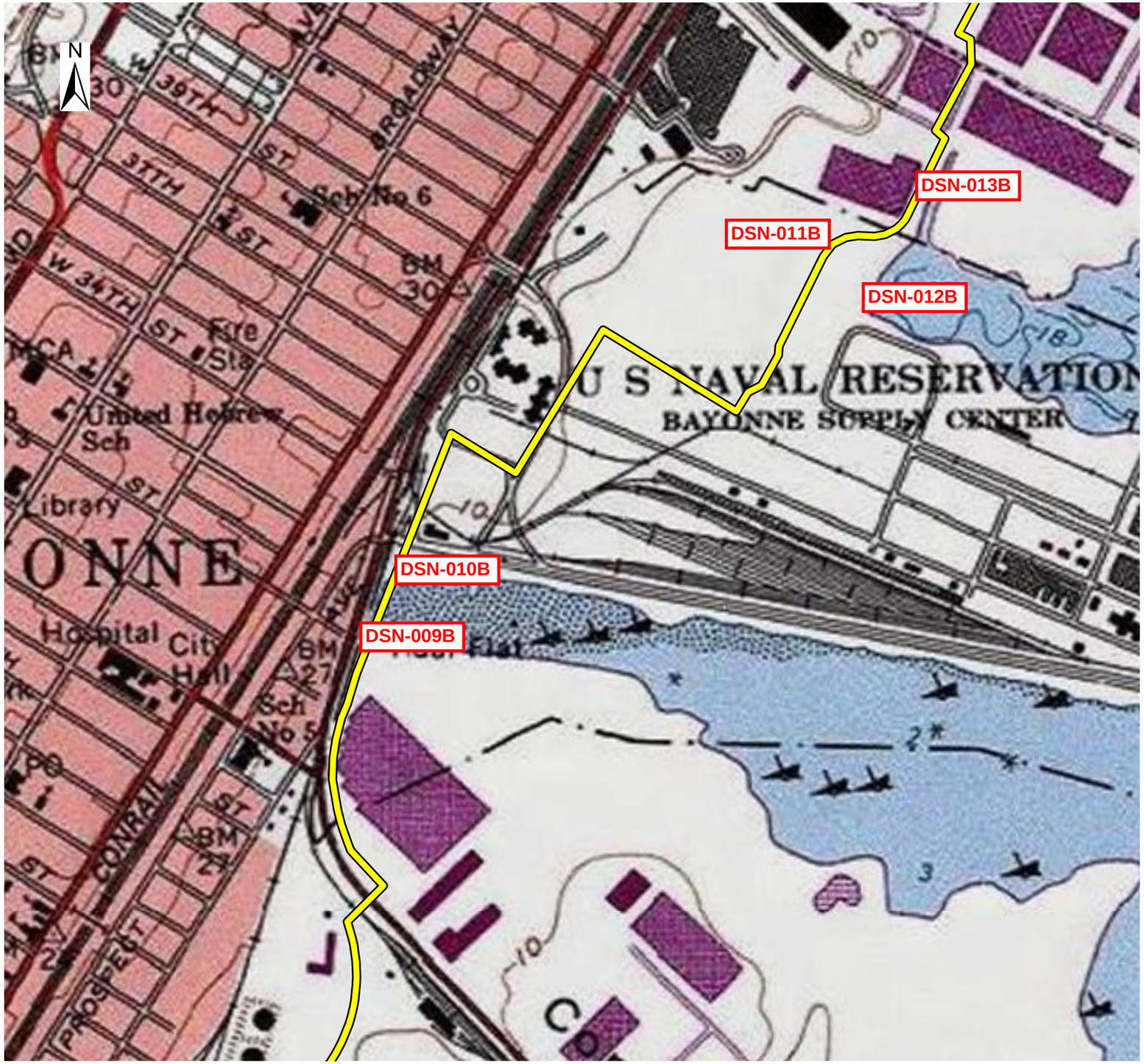

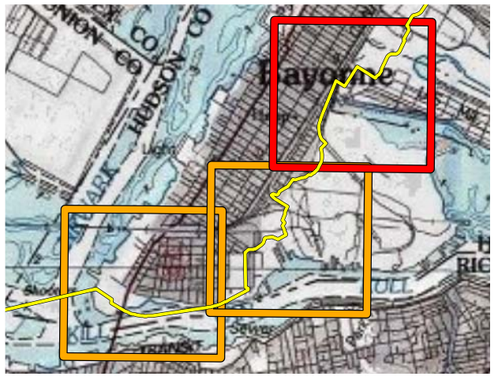

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SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
BAYONNE, NJ

FIGURE 3

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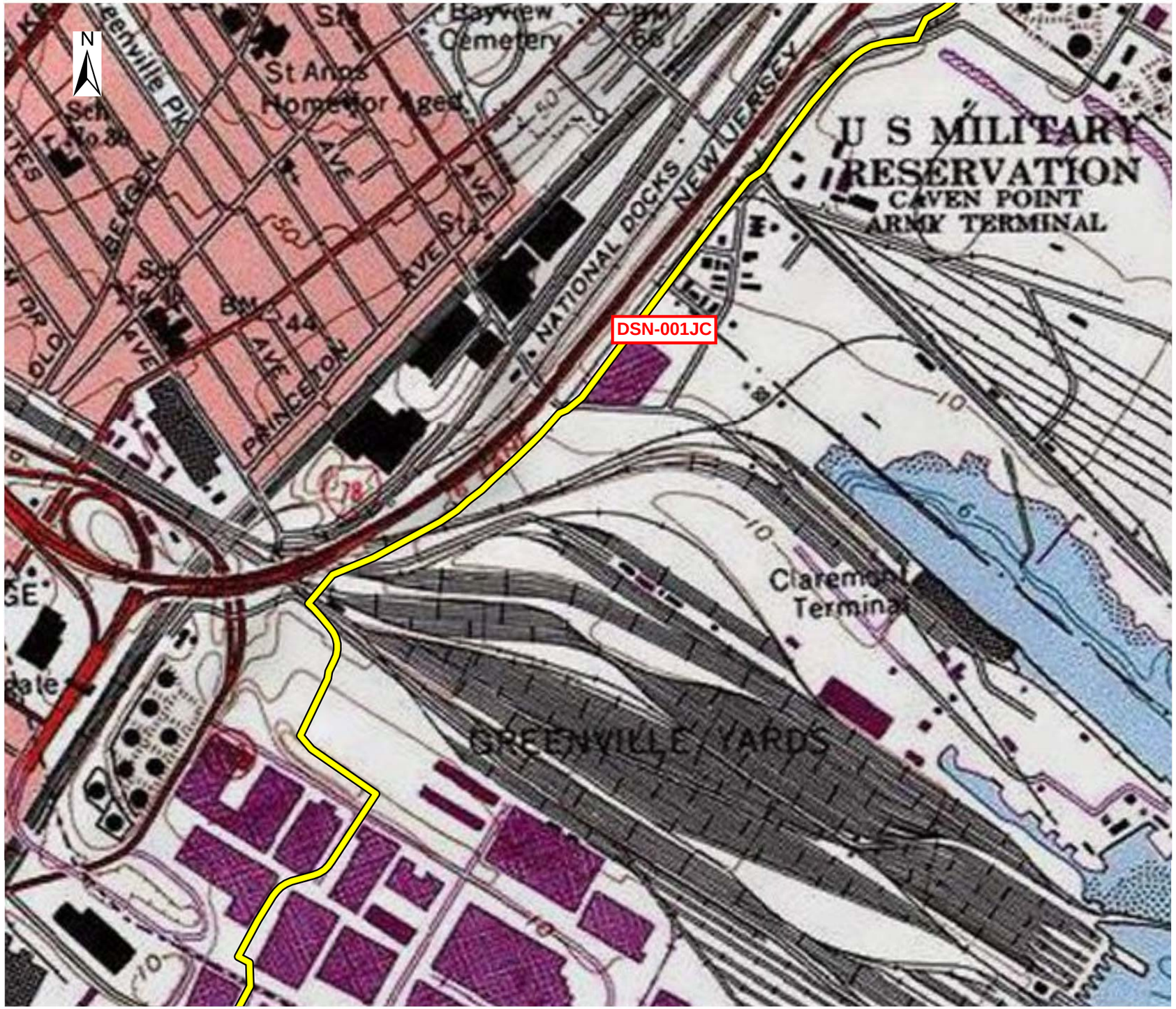
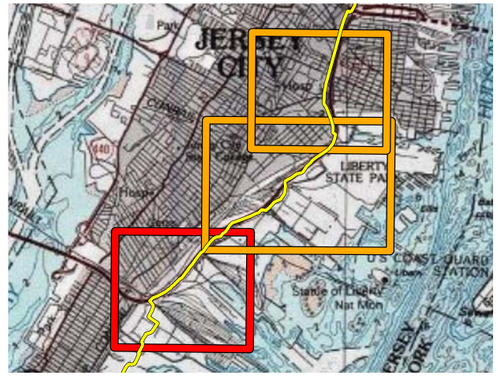
Outfall Locations for Surface Water Discharges in Jersey City, NJ																
Outfall Number	**Latitude**	**Longitude**	**Receiving Media (Surface Water, Wetland, Storm Sewer)**	**Receiving Media Classification**	**Receiving Water Body**	**Receiving Water Body Classification**	**Site Owner Name of Location of Ground Water Trenching**	**Site Address of Location of Ground Water Trenching**	**Freq. in Days/Week**	**Freq. in Avg. Months/Year**	**Flow Rate in Monthly Avg (mgd)**	**Flow Rate Daily Max (mgd)**	**Total Volume Flow for Monthly Avg**	**Total Volume Flow in daily max**	**Duration in Days**	**Discharge Category**
DSN-001JC	40° 41' 28.68"	74° 05' 01.15"	Surface Water	SE2	Unnamed tributary that empties into golf course and then Upper New York Bay	SE2	City of Jersey City	Caven Point Road, Jersey City, NJ, 07305	6	2	1.4	1.4	42	1.4	50	
DSN-002JC	40° 41' 47.23"	74° 04' 36.89"	Wetland	PEM	Unnamed tributary to the Upper New York Bay	SE2	City of Jersey City	Caven Point Road, Jersey City, NJ, 07305	6	1	0.75	0.75	21.8	0.75	29	
DSN-003JC	40° 41' 59.68"	74° 04' 10.32"	Wetland	PFO	Unnamed tributary to the Upper New York Bay	SE2	City of Jersey City	Caven Point Road, Jersey City, NJ, 07305	6	1	0.40	0.40	11.6	0.75	29	
							WA Golf Company, LLC	Caven Point Road, Jersey City, NJ, 07305								
DSN-004JC	40° 41' 43.76"	74° 04' 40.86"	Wetland	PEM	Unnamed tributary to the Upper New York Bay	SE2	United States of America	Caven Point Road, Jersey City, NJ, 07305	6	1	0.65	0.65	18.9	0.65	29	
DSN-005JC	40° 41' 47.23"	74° 03' 09.94"	Surface Water	SE2	Upper New York Bay	SE2	City of Jersey City	Burma Road, Jersey City, NJ 07304	6	1	1.4	1.4	40.6	1.4	29	
							Consolidated Rail Corporation	Burma Road, Jersey City, NJ 07304								
							City of Jersey City	Phillip Street, Jersey City, NJ 07304								
							Simpson Burma Road LLC	w/s Burma Road, Jersey City, NJ 07304								
DSN-006JC	40° 42' 34.20"	74° 03' 17.23"	Surface Water	FW2-NT	Unnamed tributary to Hudson River	SE2	NJDEP	Block 2048, Lot po H.3, Jersey City, NJ, 07304	6	2	1.4	1.4	42	1.4	40	
							NJDEP	222 Jersey City Blvd, Jersey City, NJ, 07304								
DSN-007JC	40° 42' 34.96"	74° 03' 16.35"	Wetland	PEM	Unnamed tributary to Hudson River	SE2	NJDEP	222 Jersey City Blvd, Jersey City, NJ, 07304	6	2	1.4	1.4	42	1.4	40	
DSN-008JC	40° 42' 45.49"	74° 03' 12.51"	Surface Water	SE2	Inlet to Upper New York Bay	SE2	New Jersey Transit Corp.	Johnston Avenue, Jersey City, NJ 07304	6	2	1.4	1.4	42	1.4	50	
							The View at Jersey City Urban	246 Johnston Avenue, Jersey City, NJ, 07304								
							Renewal, LLC	246 Johnston Avenue, Jersey City, NJ, 07304								





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SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
JERSEY CITY, NJ

FIGURE 1

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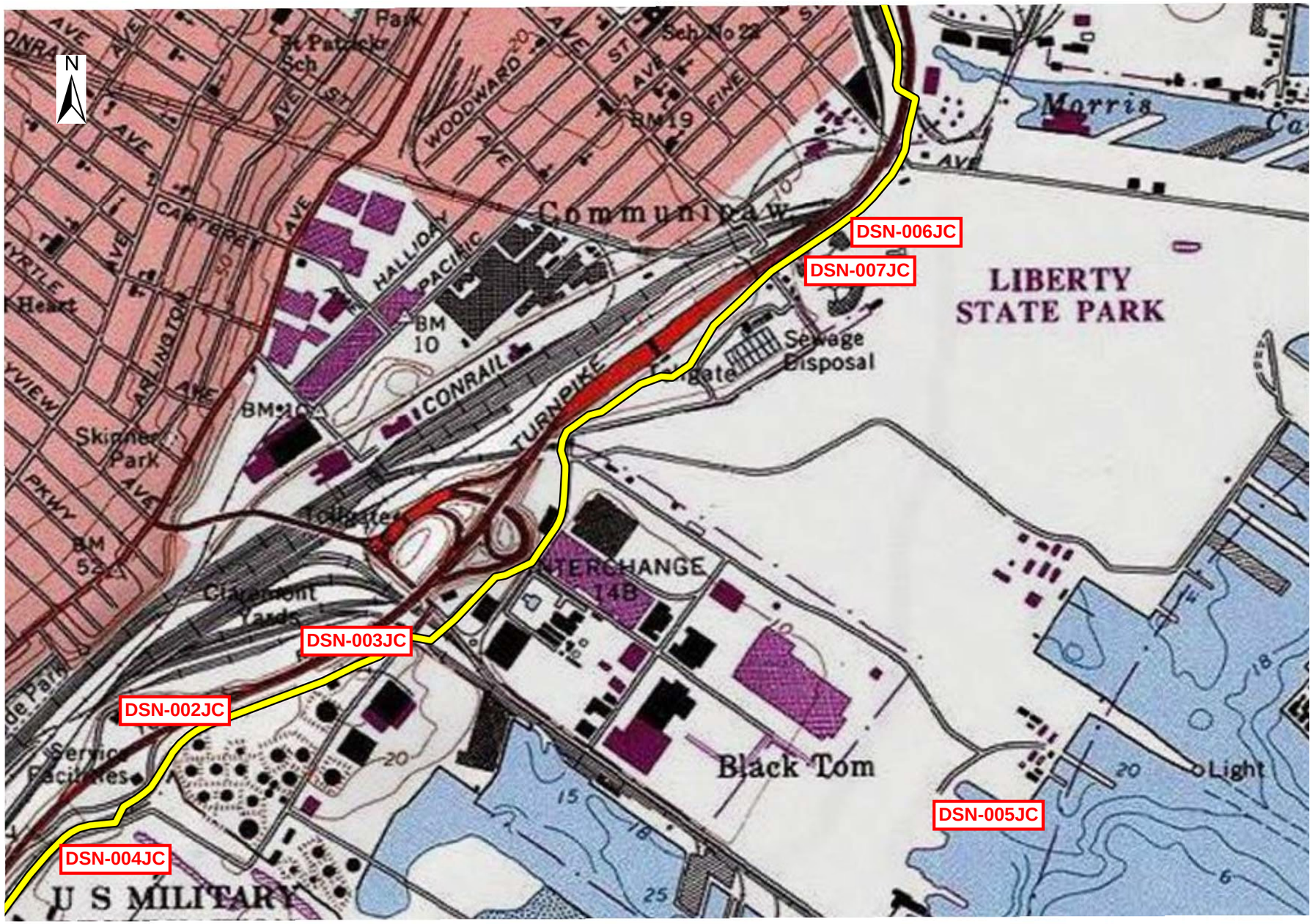

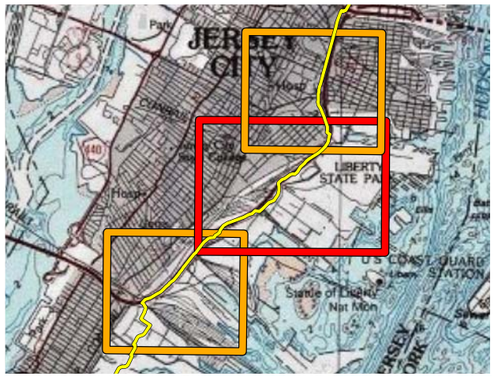

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Quadrangle, NJ-NJ (1981), 7.5 minutes series.

0 1,000 Feet

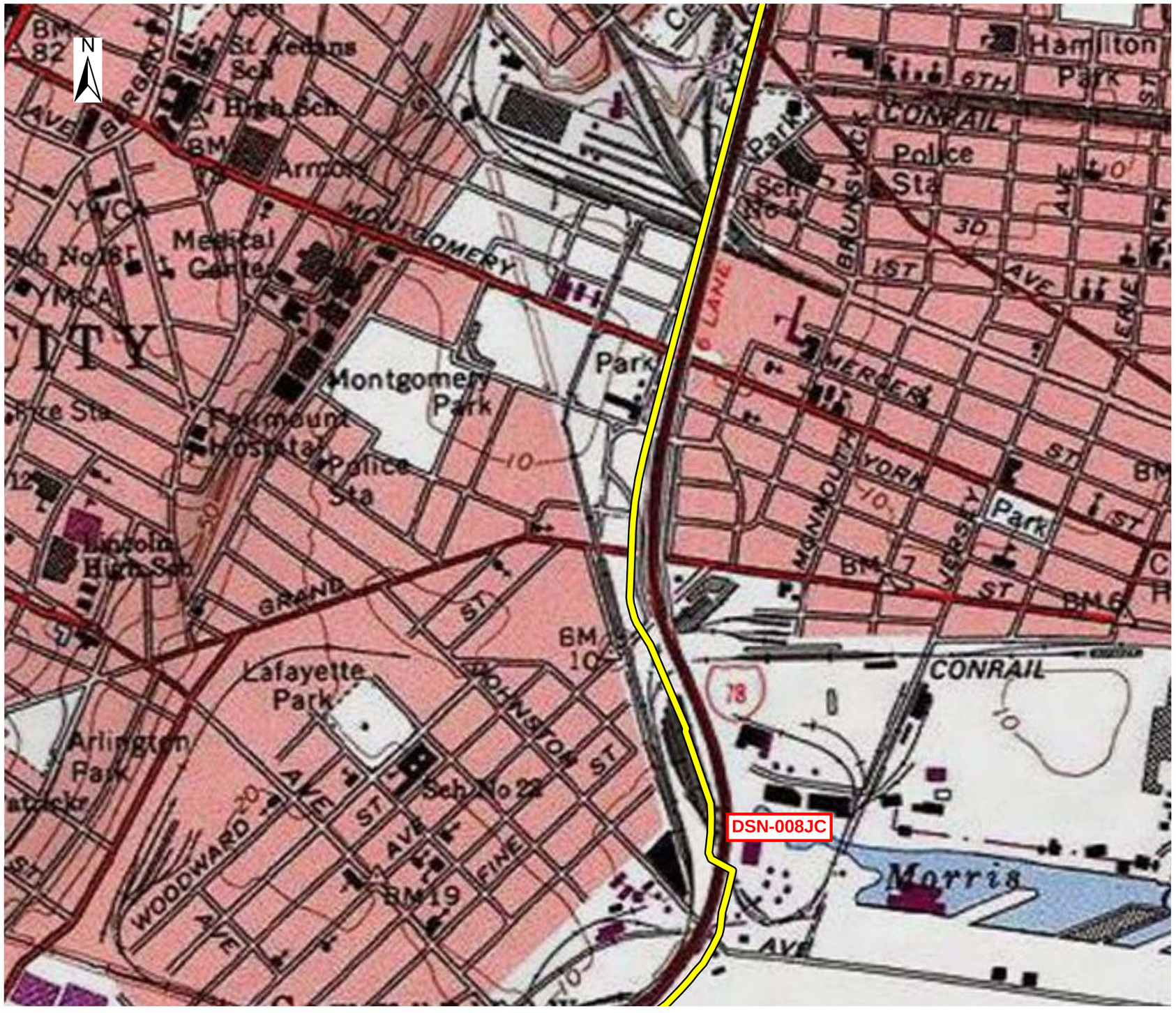
Spectra Energy

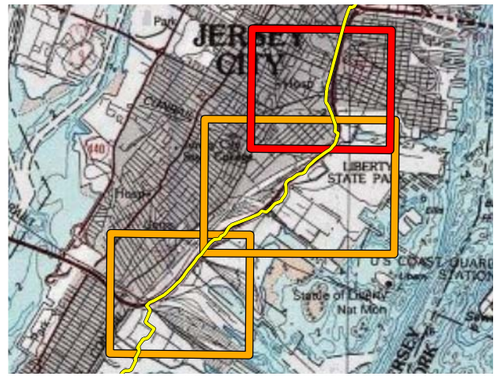
SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
JERSEY CITY, NJ

FIGURE 2

Created by: TRC **Date: December 2011**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Topos for SW Discharge\Jersey City Map_2.mxd





Legend

Proposed Pipeline

Source: ArcGIS Map Service
Name: USA_Topo_Maps
USGS Quadrangles: Jersey City
Quadrangle, NJ-NJ (1981), 7.5 minutes series.

0 700 Feet

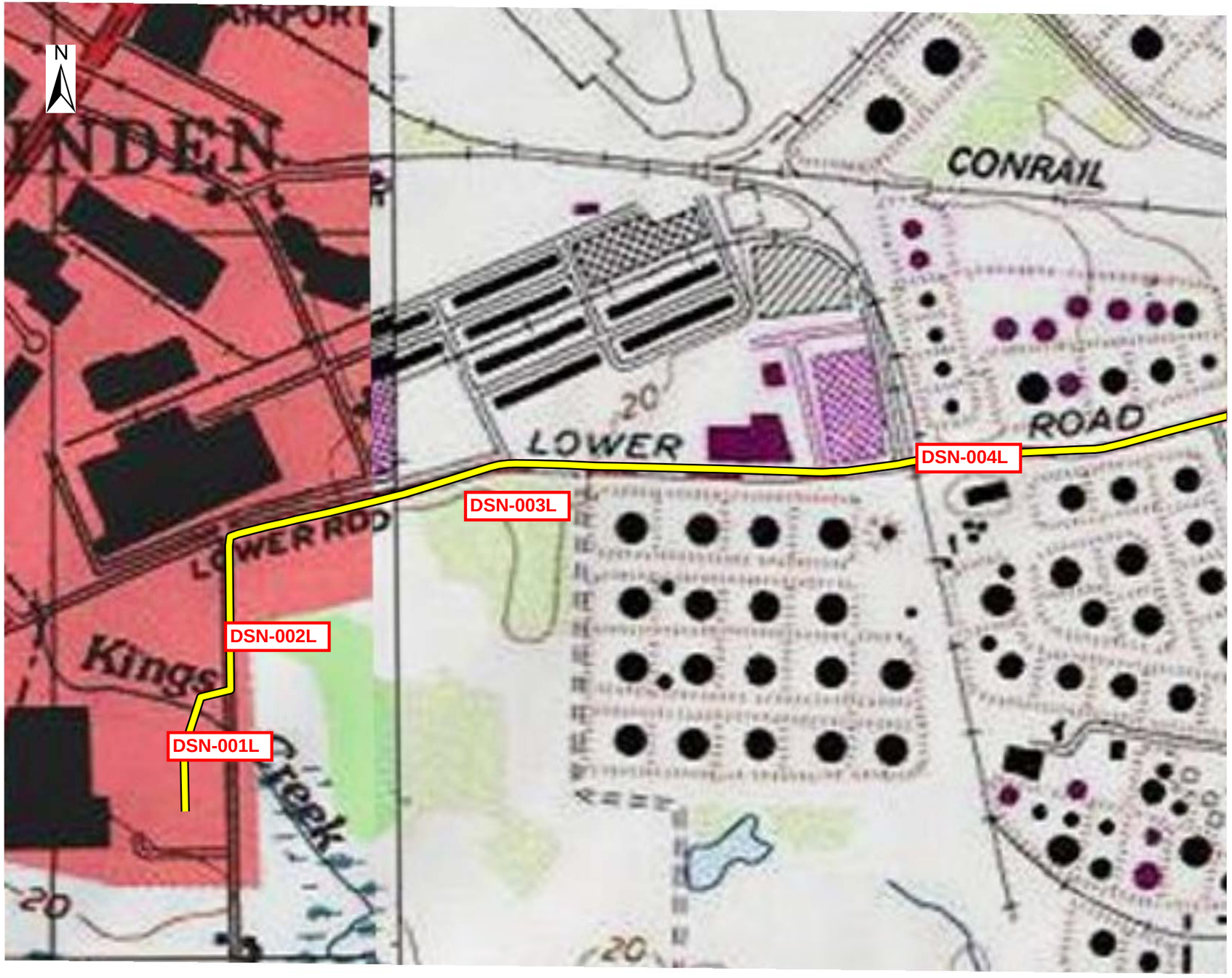
SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
JERSEY CITY, NJ

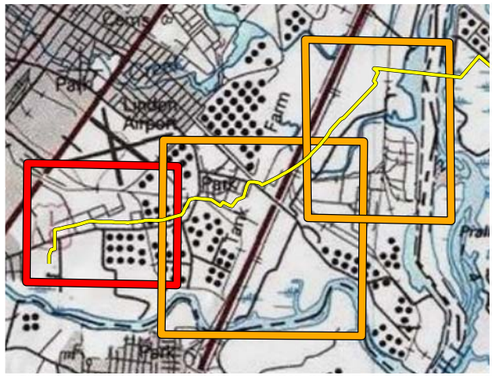
FIGURE 3

Created by: TRC **Date: December 2011**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Topos for SW Discharge\Jersey City Map_3.mxd

Outfall Location for Surface Water Discharges in Linden, NJ															
Outfall Number	**Latitude**	**Longitude**	**Receiving Media (Surface Water, Wetland, Stormwater Catch Basin)**	**Receiving Media Classification**	**Receiving Waterbody**	**Receiving Waterbody Classification**	**Site Owner Name of Location of Ground Water Trenching**	**Site Address of Location of Ground Water Trenching**	**Freq. in Days/Week**	**Freq. in Avg. Months/Year**	**Flow Rate in Monthly Avg (mgd)**	**Flow Rate Daily Max (mgd)**	**Total Volume Flow for Monthly Avg**	**Total Volume Flow in Daily Max**	**Duration in Days**	**Discharge Category**
DSN-001L	40° 36' 22.22"	74° 15' 09.03"	Surface Water	SE2	Kings Creek	SE2	Texas Eastern Transmission, LP	1301 Lower Rd, Linden, NJ 07036	6	2	0.4	0.4	12.0	0.4	34	
							City of Linden	Range Road, Linden, NJ 07036								
DSN-002L	40° 36' 25.37"	74° 15' 08.37"	Wetland	PEM	N/A	N/A	Linden Warehouse & Distribution Co.	260 Range Rd, Linden, NJ 07036	6	1	0.4	0.4	8.0	0.4	20	
DSN-003L	40° 36' 33.30"	74° 14' 54.57"	Wetland	SE2	Kings Creek	SE2	Ridge Associates	1700-1751 Lower Rd, Linden, NJ 07036	6	1	0.4	0.4	8.0	0.4	20	
DSN-004L	40° 36' 36.14"	74° 14' 13.48"	Stormwater Catch Basin (Along Lower Rd)	SE3	Marshes Creek	SE3	City of Linden	Lower Road, Linden, NJ 07036	6	1	0.4	0.4	8.0	0.4	20	
DSN-005L	40° 36' 47.36"	74° 13' 59.93"	Stormwater Catch Basin (Along Parkway Ave)	SE3	Marshes Creek	SE3	Citgo Petroleum Corp.	801 Lower Road Rear Linden, NJ 07036	6	1	0.4	0.4	8.0	0.4	20	
DSN-006L	40° 36' 40.73"	74° 13' 50.45"	Surface Water	SE3	Marshes Creek	SE3	City of Linden	350 Madison Street Rear, Linden, NJ 07036	6	3	0.4	0.4	12.0	0.4	90	
DSN-007L	40° 36' 39.64"	74° 13' 49.39"	Wetland	EEM	Marshes Creek	SE3	Citgo Petroleum Corp.	801 Lower Road Rear Linden, NJ 07036	6	3	0.4	0.4	12.0	0.4	90	
							City of Linden	350 Madison Street Rear, Linden, NJ 07036								
DSN-008L	40° 36' 33.29"	74° 13' 37.23"	Surface Water	SE3	Marshes Creek	SE3	Transcontinental Gas Pipeline Corp	Marshes Creek Area, Immediately west of I-95, Linden, NJ 07036	6	1	0.4	0.4	8.0	0.4	20	
DSN-009L	40° 36' 29.48"	74° 13' 27.71"	Surface Water	SE3	Marshes Creek	SE3	Support Terminals Operating LP	3700 Tremley Point Road Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-010L	40° 36' 56.01"	74° 13' 08.70"	Surface Water	SE3	Piles Creek	SE3	E.I. Dupont De Nemours & Company	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-011L	40° 37' 05.48"	74° 12' 54.83"	Surface Water	SE3	Winians Creek	SE3	NUI Corp. d/b/a Elizabethtown Gas Co. (PSE&G)	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-012L	40° 37' 11.68"	74° 12' 45.75"	Surface Water	SE3	Piles Creek	SE3	NUI Corp. d/b/a Elizabethtown Gas Co. (PSE&G)	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-013L	40° 37' 16.55"	74° 12' 41.90"	Wetland	EEM	Piles Creek	SE3	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-014L	40° 37' 18.99"	74° 12' 45.35"	Surface Water (Pond)	FW2-NT	N/A	N/A	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-015L	40° 37' 16.46"	74° 12' 41.57"	Surface Water	SE3	Unnamed Tributary to Piles Creek	SE3	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-016L	40° 37' 18.94"	74° 12' 40.73"	Wetland	PEM	N/A	N/A	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-017L	40° 37' 19.94"	74° 12' 41.78"	Wetland	PEM	N/A	N/A	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-018L	40° 37' 22.68"	74° 12' 36.89"	Wetland	PEM	N/A	N/A	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-019L	40° 37' 26.50"	74° 12' 33.66"	Wetland	PEM	N/A	N/A	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	
DSN-020L	40° 37' 25.95"	74° 12' 25.93"	Surface Water	SE3	Arthur Kill	SE3	PSE&G Power LLC	PSE&G Linden Generating Station (Formerly Dupont), Wood Avenue South, Linden, NJ 07036	6	1	0.5	0.5	8.8	0.5	18	





Legend

Proposed Pipeline

0 500 Feet

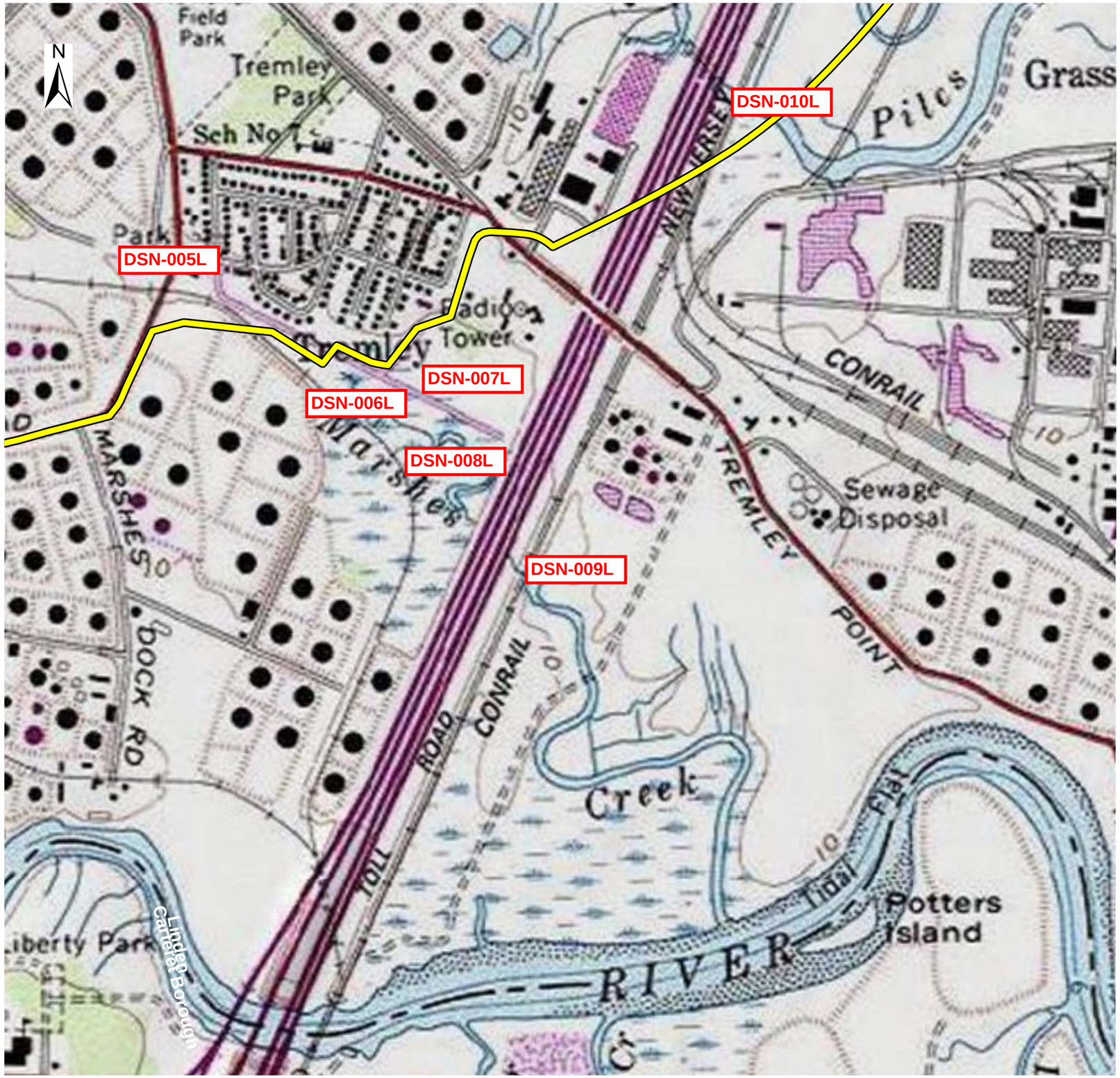
Source: ArcGIS Map Service
Name: USA_Topo_Maps
USGS Quadrangles: Arthur Kill Quadrangle, NJ-NJ (1981), 7.5 minutes series.

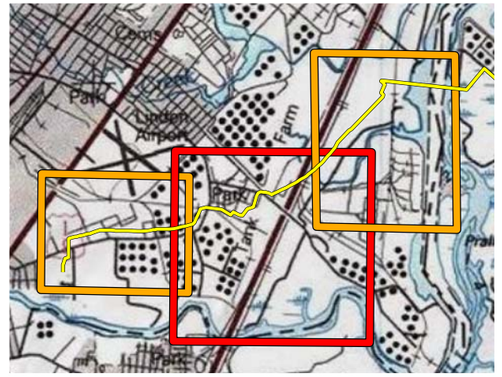
Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Topos for SW Discharge\Linden Map_1.mxd

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
LINDEN, NJ

FIGURE 1

Created by: TRC **Date: December 2011**





Legend

Proposed Pipeline

Source: ArcGIS Map Service
Name: USA_Topo_Maps
USGS Quadrangles: Arthur Kill Quadrangle, NJ-NJ (1981), 7.5 minutes series.

0 700 Feet

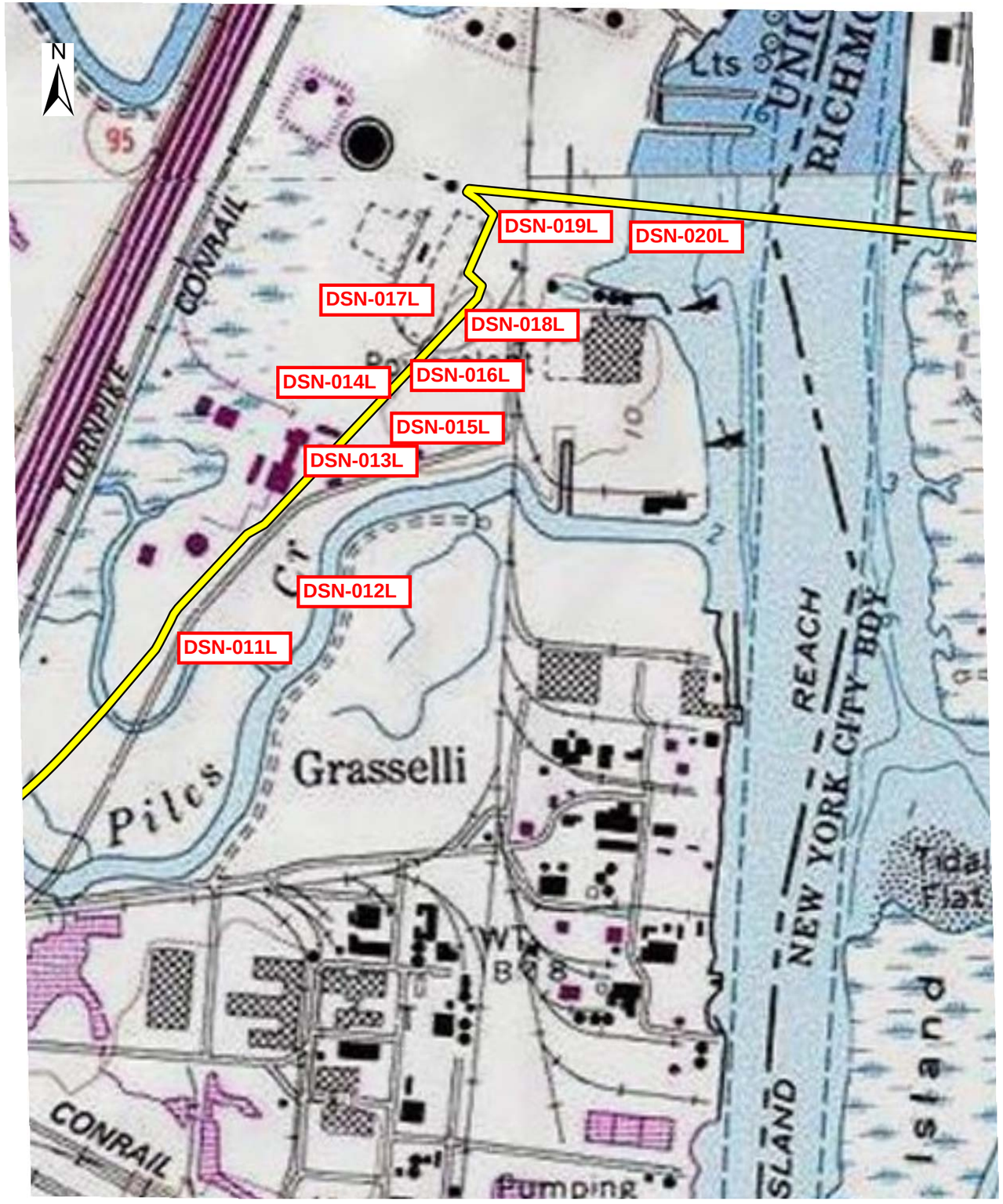
Spectra Energy

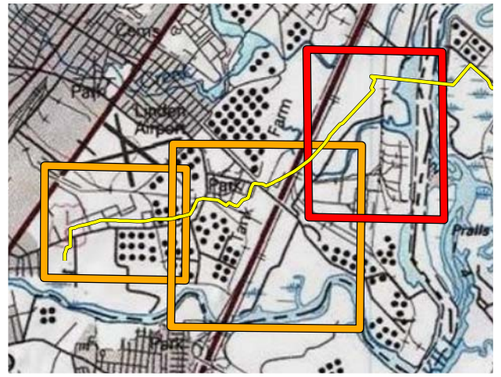
SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
LINDEN, NJ

FIGURE 2

Created by: TRC **Date: December 2011**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Topos for SW Discharge\Linden Map_2.mxd





Legend

Proposed Pipeline

Source: ArcGIS Map Service
Name: USA_Topo_Maps
USGS Quadrangles: Arthur Kill and Elizabeth Quadrangles, NJ-NJ (1981), 7.5 minutes series.

0 700
Feet

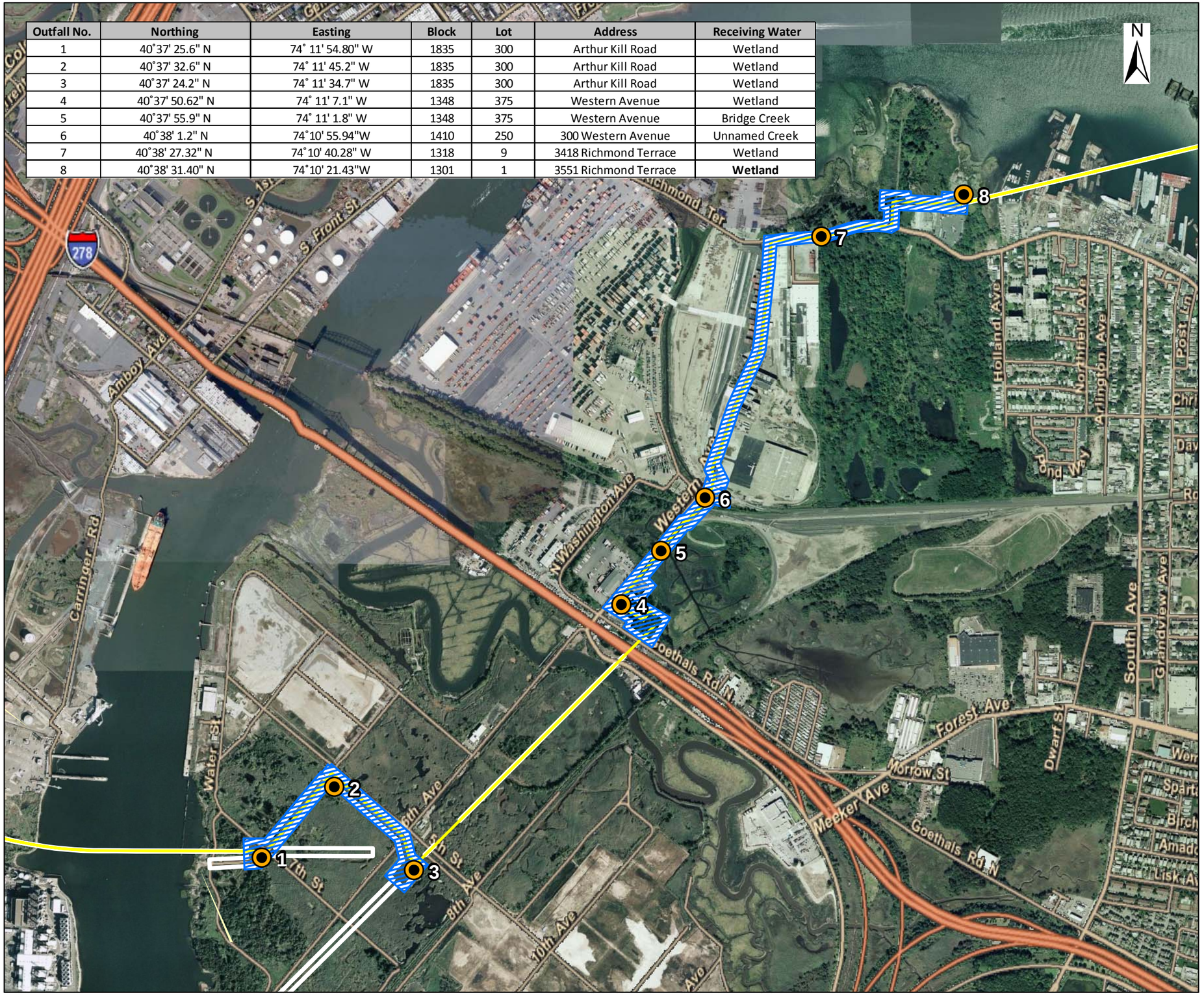
SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
TOPOGRAPHIC MAP WITH OUTFALL LOCATIONS
LINDEN, NJ

FIGURE 3

Created by: TRC **Date: December 2011**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Topos for SW Discharge\Linden Map_3.mxd

Outfall No.	Northing	Easting	Block	Lot	Address	Receiving Water
1	40˚37' 25.6" N	74˚ 11' 54.80" W	1835	300	Arthur Kill Road	Wetland
2	40˚37' 32.6" N	74˚ 11' 45.2" W	1835	300	Arthur Kill Road	Wetland
3	40˚37' 24.2" N	74˚ 11' 34.7" W	1835	300	Arthur Kill Road	Wetland
4	40˚37' 50.62" N	74˚ 11' 7.1" W	1348	375	Western Avenue	Wetland
5	40˚37' 55.9" N	74˚ 11' 1.8" W	1348	375	Western Avenue	Bridge Creek
6	40˚38' 1.2" N	74˚10' 55.94"W	1410	250	300 Western Avenue	Unnamed Creek
7	40˚38' 27.32" N	74˚10' 40.28" W	1318	9	3418 Richmond Terrace	Wetland
8	40˚38' 31.40" N	74˚10' 21.43"W	1301	1	3551 Richmond Terrace	**Wetland**



Legend

- Outfall Location and Identification Number
- Pipeline
- Workspace
- Trench Dewatering

0 1,000 Feet

Spectra Energy

OUTFALL LOCATIONS
STATEN ISLAND, NY

FIGURE 2

Created by: TRC **Date: August 2011**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\NY Figures\Figure 1_2.mxd

Outfall No.	Northing	Easting	Block	Lot	Address	Receiving Water
9	40˚44' 21.89" N	74˚00'41.67" W	651	17	Pier 52	Hudson River
10	40˚44' 21.05" N	74˚ 00'38.82" W	651	1	427 Gansevoort Street	Hudson River

Legend

- Outfall Location and Identification Number
- Pipeline
- Workspace
- Trench Dewatering

0 100 Feet

Spectra Energy

OUTFALL LOCATIONS
NEW YORK CITY, NY

FIGURE 3

Created by: TRC Date: August 2011

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\NY Figures\Figure 2_2.mxd

APPENDIX B

SOIL MANAGEMENT PLAN

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

This Soil Management Plan ("SMP") has been developed as a component of an overall Excavation Management Plan ("EMP") to facilitate the installation of the NJ-NY Expansion Project. The NJ-NY Expansion Project limits are defined as the trench, layout, and ancillary installation areas along the route where excavation activities will occur for the purpose of pipeline installation. Management of soil excavated during construction activities proposed along the NY-NJ Expansion Pipeline route will be performed under one EMP as set forth in the guidelines by the New Jersey Department of Environmental Protection ("NJDEP") and New York State Department of Environmental Conservation ("NYSDEC") (Technical Requirements N.J.A.C. 7:26E, NJDEP Fill Guidance at SRP Sites, NJDEP Linear Construction Projects Guidance and 6 NYCRR Part 375/DER-10/CP-51, respectively).

The purpose of this SMP is to set forth those actions that the Applicants and their construction contractor (the Contractor) will perform to maintain compliance with state and federal regulations and guidelines.

1.1 NJ-NY Expansion Project Licensed Site Remediation Professional

The New Jersey legislature recently passed the Site Remediation Reform Act ("SRRA"), which included the procedures for granting licenses to Licensed Site Remediation Professionals ("LSRPs"). It is the intent of SRRA that all new sites, and all sites after May 2012, be regulated by a LSRP, who is authorized to determine compliance with New Jersey regulations and issue determinations of completeness of remediation.

As part of the currently evolving guidance and regulations under SRRA, the NJDEP has formed several stakeholder groups. One of these groups has developed a guidance document for linear construction projects, which will govern projects such as the NJ-NY Expansion project. This guidance document was published in late 2011. The NJDEP views this guidance as one of many guidance documents that the LSRP can follow in order to satisfy the Technical Requirements for Site Remediation (TRSR, N.J.A.C. 7:26E). Thus, the TRSR is being re-adopted to be less prescriptive and more performance based. The current Linear Construction Project ("LCP") Guidance Document requires that an LSRP be assigned to linear construction projects to ensure compliance with the LCP Guidance and other relevant portions of the TRSR. The role of the LSRP is to oversee the management of contamination encountered during the project. The LSRP for the NJ-NY Expansion Project will be:

Christopher J. Hoen, CPG, LSRP
LSRP License Number: #508212
TRC Environmental Corporation
57 East Willow Street
Millburn, NJ 07041
Telephone: (973) 564-6006, ext. 204

The LCP Guidance requires that a Final Linear Construction Report be submitted that summarizes the history of investigations and material management activities as they pertain to the construction project. The NJDEP does not require the LSRP to issue or file a Remedial Action Outcome "(RAO") at the completion of the Linear Construction Project.

A Final Linear Construction Report will be prepared for the entire project. In addition to the comprehensive Report for the entire project, this report will be subdivided into two separate reports describing the portions of the project in New Jersey and New York separately. The New York sub-report will be submitted to the NYSDEC for their review and files. The New Jersey portion of the report will be submitted to the NJDEP and maintained by the Project LSRP in his records.

1.2 Project Staffing Manager

The Project Staffing Manager will be responsible for assigning staff to perform day-to-day inspection and oversight of construction activities, including soil excavation and management, stockpiling, loading, transportation, decontamination activities, and documentation of these activities. The staff team will include Operations Managers who will plan the transportation and disposal of soils and other excavated materials on a daily basis, Dispatchers who will issue Bills of Lading and Manifests for pre-characterized soils, Excavation Management Plan ("EMP") Inspectors assigned to each construction crew, and Runners who will ensure the timely transmittal of properly executed documentation to accompany each load of soil that is transported and disposed.

1.3 Planned Construction and Anticipated Site Conditions

Refer to Sections 1.0 and 2.0 of the EMP for a description of anticipated site conditions in proximity to activities being performed under this SMP, and a description of planned pipeline construction methods, respectively.

1.3.1 Immediate Environmental Concerns and other notification requirements (Applicable to the New Jersey Portion of the Pipeline Route)

Immediate Environmental Concern ("IECs") have been identified by the NJDEP as a condition at a contaminated site where any of the following types of contamination or any of the following conditions related to the discharges at the site are found:

- Contamination in a well-used for potable purposes at concentrations above the NJDEP Class IIA Groundwater Remediation Standards;

- Contamination in indoor air at a level greater than the Rapid Action Levels described in the NJDEP's Vapor Intrusion Guidance;

- Contamination that exceeds the NJDEP's acute health effect levels in the upper 6 inches of the soil column and there is actual or potential for human contact via dermal contact, ingestion or inhalation. Acute health effect means that an adverse human health impact could result from an exposure of less than 2 weeks.

IECs trigger certain notification requirements as set forth in the Technical Requirements N.J.A.C. 7:26E-1.14 in New Jersey. If any of the above-referenced conditions are encountered during the performance of EMP activities, the Applicants, the Project LSRP and NJDEP shall be notified immediately. The condition will then be addressed under N.J.A.C. 7:26E-1.14 and the IEC Technical Guidance, August 2011. The NJDEP should also be notified when the following conditions are identified:

- An environmental emergency, such as a condition that is immediately dangerous to life and health, after 911 is called;
- Discovery of an underground storage tank;
- A new discharge is identified; and
- Free product is encountered within the linear construction project.

1.4 Contractor Submittals

The following submittals are to be made to the Applicant and the Project Staffing Manager by the Contractor within 30 calendar days of receiving the Notice to Proceed.

1.4.1 Health and Safety Plan

The Contractor shall prepare and submit a Site-specific Health and Safety Plan for review and acceptance by the Applicants. The Contractor shall also provide a copy of this plan to the Project Staffing Manager. The Health and Safety Plan shall be prepared and implemented in compliance with governmental requirements, including worker safety requirements mandated by Federal OSHA.

1.4.2 Variations from the Soil Management Plan

The Contractor shall notify the Applicants in writing of any variations to this SMP. Any variations will be subject to the approval of the Applicants and the Project Operations Manager.

Unanticipated site conditions encountered during the performance of EMP activities along the NJ-NY Expansion Project pipeline route will be addressed as set forth in the Immediate Response Plan included as Appendix E of the EMP.

2.0 SOIL MANAGEMENT PROCEDURES

The SMP was developed to:

- Ensure consistency during the various phases of construction;
- Limit potential liabilities to the Applicants associated with improper management of contaminated material; and
- Ensure compliance with State (NJDEP and NYSDEC) and federal regulations and policies, as applicable.

2.1 Soil Management Activities

In the planning of construction activities, the Applicants have identified areas where they plan to return excavated soil back into the trench after pipe installation, and other ("load and go") areas where all excavated materials will be transferred to trucks, transported for off-site disposal, and the excavation will be backfilled with imported select fill to ensure adequate compaction after pipe installation. The Applicant has conducted pre-characterization sampling, and in "load and go" areas, is collecting additional soil samples to meet waste classification sampling frequencies and obtain pre-excavation approvals from appropriate disposal sites.

Excavated materials from the NY-NJ Expansion Project are being characterized and managed in accordance with the following procedures:

- Review of existing environmental studies and regulatory files performed by others to date;
- Pre-characterization of soil and groundwater along the pipeline alignment;
- Supplemental sampling for waste classification to meet disposal acceptance criteria;
- Performance of SMP activities to address known and unknown soil contamination disturbed during excavation work in accordance with appropriate soil management procedures as specified herein; and
- Preparation of the Final Linear Construction Report for the NY-NJ Expansion Project to document implementation of the EMP.

The preferred disposition of excavated materials is to place the material back in the excavation in the sequence it was removed. However, some excavated materials may not be suitable for use as backfill within the pipeline trench (for example, excavated material that contains free or residual product and/or hazardous material). Material that is characterized as hazardous waste will not be used as backfill in the pipeline trench. In some areas (e.g., city streets, commercial parking lots), it may be necessary to backfill imported fill of known geotechnical properties within the excavated trench, which can result in an excess of excavated material to be managed. Some materials may be unsuitable for use as backfill due to the presence of construction debris, other oversize material or excess moisture.

Classification of excavated soils will be based on initial and final classification procedures as described below. The initial classification procedures will consist of field screening to determine whether or not the material is suitable for on-site reuse and final classification procedures will consist of review of pre-characterization and waste classification chemical analyses to classify the soil into the appropriate category as described below.

During pipeline construction on known regulated sites in New York, the materials on site will be handled in accordance with the site-specific Site Management Plan.

2.2 Field Screening Procedures for Soil Reuse

Field Screening will be performed by the EMP Inspector during excavation activities. Field Screening will consist of olfactory and visual evidence of contamination and photoionization detector ("PID") readings as described in Table 1 below. Soils will be segregated based on pre-characterization data and field screening results into material that can be used as cover, material that can be reused below the cover, and material that is planned for, or should be included with, off-site disposal. Initial classification activities are described below.

Table 1. Field Screening Criteria for Excavated Soil

Evaluation Method	Passing Criteria
Visual and Olfactory	Should be free of petroleum and not exhibit unnatural odor, color or staining.
Volatile Organic Compounds Screening	Reading less than 10 parts per million above background levels using Photoionization Detector with appropriate ionization potential for contaminants of concern.

2.2.1 Visual Evaluation

Throughout site excavation activities, excavated soils will be examined continuously for visual evidence of contamination. Visual evidence will include staining, the presence of cinders, ash, slag or other non-soil fill materials, and presence of free and residual product.

2.3 Procedures for Laboratory Testing for off-Site Disposal

2.3.1 Stockpiling

Excavated material that is to be placed back in the same excavation after pipe installation may be sidecast adjacent to the excavation. Sidecast soil will be returned to the same portion of the trench from which they were excavated. If feasible, the soils will be returned in the reverse order from which they were excavated; i.e., last and deepest soils excavated returned first to the deepest part of the trench. No sampling of this soil is required.

The on-going pre-characterization and waste classification sampling programs are designed to collect the data needed to obtain disposal facility approvals and acceptances, so that the majority of the excavated material destined for off-site disposal can be transported directly to the disposal site with no additional sampling needed. In some instances (e.g., greater volumes excavated than had been pre-classified, excavated soils that differ from the pre-characterization results), it may be necessary to transport excess soils to temporary storage yards for further sampling and classification prior to disposal. At present, it is anticipated that two or three temporary storage yards will be secured and prepared for stockpiling; at a minimum, storage yards will be established in Hudson County and either one or both of Linden, New Jersey and Staten Island, New York.

2.3.2 Laboratory Analysis

Potentially contaminated soil designated for additional testing will be stockpiled in accordance with Section 2.0 of this SMP for subsequent testing. The types and frequencies of tests to be conducted will be based on previous pre-characterization and waste classification data, conditions encountered during excavation and the permit requirements of the receiving recycling or disposal facility.

Contaminated material that is not a hazardous waste will be disposed of off-site at an appropriate facility in accordance with local, state and federal guidelines and regulations. Material that is determined to be a

hazardous waste will be stored, handled, transported and disposed in compliance with federal and state hazardous waste regulations.

The Project Operations Manager and his designees will be responsible for tracking the results of analytical testing, making soil classification decisions, and documenting the transport and disposal of each waste stream.

2.4 Quality Assurance/Quality Control Procedures for Laboratory Analyses

The following minimum quality assurance/quality control ("QA/QC") procedures will be followed during all sampling and analyses activities:

- Field and laboratory chain-of-custody;
- State-certified laboratory; and
- EPA-, NJDEP- and NYSDEC-approved analytical procedures.

The detection limits for all analysis will be sufficiently low to allow confirmation that above-referenced recycling or disposal criteria are met.

The Project Staffing Manager or his designee will be responsible for QA/QC for the soil management program. The EMP Inspector will be required to complete a daily field report form and submit field observations and monitoring data on a daily basis. Specifically, soil characterization, segregation, stockpiling, transportation and disposal activities will be documented in the daily field report to facilitate communication among all parties and support decisions regarding the disposition of excavated soil.

2.5 Off-site Disposal and Other Solid Waste

For soils that are designated for direct loading and off-site disposal ("load and go"), the soils will, in many instances, have been per-classified and accepted for disposal at an appropriate disposal facility. For these areas, no additional sampling will be needed.

In the event that excavated material needs to be stockpiled for additional characterization and waste classification, the requisite number of samples will be collected. After the results of analytical testing have been evaluated, off-site disposal will be coordinated by the Project Operations Manager and the Applicants. Based on historic uses and processes and the analytical testing, appropriate soil accepting facilities will be identified.

Once the Applicants have approved the final disposition of soil removal options, The Project Operations Manager and Applicants will arrange for transport and disposal of contaminated materials. For most "load and go" soils, the excavated material will be pre-approved at an appropriate disposal facility and will be transferred to trucks from the trench and transported to the identified disposal site. For stockpiled soils, the material will be loaded and transported to the identified disposal site. A Bill of Lading ("BOL") or Hazardous Waste Manifest will be used to ship soil from the site to the selected facility. Contaminated stockpiled soils shall be removed from staging areas within 120 days of its initial excavation to an approved recycling or disposal facility.

Wastes ancillary to the contaminated soils (e.g., personal protective equipment, investigation derived wastes, *etc.*) will be managed in accordance with local, state, and federal guidelines and regulations.

2.5.1 Stockpile Handling Criteria

In the event that excess soils are generated that have not been fully classified for waste disposal, these soils will be stockpiled in conformance with applicable federal, state and local regulations governing hazardous waste, contaminated material, and soil for disposal or reuse. In the event that soils need to be stockpiled, minimum handling criteria will be as follows:

1. Excavation, material handling and stockpiling will be performed in a manner that minimizes the mixing of materials containing different levels and types of contamination to the highest degree possible. Stockpile maintenance will be the responsibility of the Contractor.

2. No re-handling of soils in designated, temporary stockpile storage areas will be carried out by the Contractor without the presence of an Applicant's Representative or the Project Operations Manager or his designee. No material will be removed without suitable segregation, stockpiling, sampling, testing and classification and completion of a BOL and/or Manifest as described herein.

3. The transfer of all materials from excavation(s) to designated, temporary stockpile areas will be the responsibility of the Contractor and will be conducted in such a manner as to not allow the spread of contaminated or potentially contaminated materials. Transfer of contaminated and potentially contaminated soils will be performed in accordance with all applicable waste management and Department of Transportation (New York and New Jersey, as applicable) requirements. At a minimum, all soils transported upon public roadways will be covered to minimize fugitive dust.

4. Designated, temporary stockpile storage areas will be secured to limit unauthorized entry and to limit contact of site workers and other passers-by with stockpiled materials. Each designated, temporary stockpile storage area will be visibly marked with appropriate signs warning of potential hazards.

5. The first lift of stockpiled materials in each designated, temporary stockpile storage area will be placed on a polyethylene liner (with a minimum thickness of 20 millimeters [mil]) over existing soil, slab or pavement. Applicant representatives or the Project Operations Manager or his designee will specify where the stockpiled materials will be placed.

6. Stockpiled materials will be placed within the designated, temporary stockpile storage areas, graded by the Contractor to shed water. The stockpile will be covered prior to inclement weather and at the end of each work day with a polyethylene minimum 6-mil thick overlapped and weighted to form a continuous waterproof barrier over the material. The cover will be maintained throughout the stockpile period to control water entering the stockpiled materials and to limit dust generation. If dust suppression becomes necessary during the soil stockpiling, at the discretion of the Applicant's Representative or the Project Operations Manager, exposed soils will be wetted by the Contractor.

7. Stockpile areas will be graded such that storm water runoff is diverted from stockpiled materials and hay bale berms/silt fencing will be placed around the perimeter of the area. Hay bales will be used as needed near catch basins, surface waters and other discharge points. Stockpile slopes will be no steeper than 1 horizontal to 1 vertical (1:1).

8. Stockpiles will be inspected at a minimum once each week and after every storm event. Inspection results will be recorded in a logbook and maintained at the site and available for inspection by the NJDEP or the NYSDEC.

While chemical analyses are being performed and while BOL and/or Hazardous Waste Manifests, as necessary, are being generated, the Contractor shall maintain the stockpiles in the designated, temporary stockpile storage areas. The Contractor will ensure that stockpiles are completely covered and that the integrity of the cover is maintained free of tears and rips. If the polyethylene cover is damaged, a new cover will be placed over the stockpile. The Contractor will also maintain and replace damaged barriers, hay bales and warning signs located by the stockpiles. The Contractor will maintain the required slope (1:1).

2.5.2 Off-site Transportation and Disposal of Material

Off-site disposal of all material from excavation activities will be performed in conformance with applicable Federal and state regulations governing hazardous waste, contaminated material, and soil waste.[1] Minimum transportation and disposal criteria are as follows:

1. No potentially contaminated excavated material will be removed for off-site disposal or recycling until the results of chemical analyses have been received and the materials have been properly classified. For much of the "load and go" materials, the material will have been sufficiently pre-classified to have obtained acceptance at an appropriate disposal site for that material. When necessary, excavated materials identified as potentially contaminated will be temporarily stockpiled by the Contractor in designated staging areas. Stockpiles will be maintained by the Contractor as described in Section 2.5.1 of this SMP.

2. Contaminated soil, hazardous material or hazardous waste designated for off-site disposal or recycling will be disposed at off-site locations appropriate for the material classification at the direction of the Applicants and the Project Operations Manager, in accordance with the laws of the appropriate federal and state authorities.

3. The Applicant's Disposal Contractor, or subcontractor(s), retained to transport contaminated materials off site, will be licensed to transport regulated soil, hazardous material, or hazardous waste, as applicable, to suitable disposal or recycling facilities.

4. All regulated soil, hazardous material, or hazardous waste transported off site will be loaded into properly licensed and permitted vehicles and transported directly to selected disposal or recycling facility(ies).

5. If dust suppression becomes necessary during soil excavation, exposed soils may be wetted. During excavation, existing asphalt, concrete or similar surface covering outside of the immediate excavation area, and which is not required to be removed for the construction, will be left in place to the extent practicable to limit the generation of dust.

[1] The Applicants may identify certain portions of the work corridor at which loading of excavated material directly onto trucks for off-site recycling or disposal may be beneficial due to space constraints, soil contamination and/or geotechnical suitability of encountered materials. Implementation of direct loading will be based on whether site conditions identified during historical and/or pre-characterization studies are representative and consistent with excavated materials observed during actual construction at these sites. If conditions are not consistent, excavated materials will be further evaluated.

6. Disposal or recycling of material from excavation activities will be in conformance with applicable federal and state regulations governing hazardous waste and contaminated material, as outlined in this SMP. Disposal or recycling facilities, which are under active and/or pending enforcement actions(s) by NJDEP. NYSDEC, USEPA, or other regulatory agencies, will not be utilized.

2.5.3 Bill of Lading

The BOL tracks the transportation and final disposition of non-hazardous contaminated soil generated during construction. BOLs will be utilized to record the shipment of non-hazardous contaminated soil from the NJ-NY Expansion Project. For this Project, unless otherwise approved by the Applicants and the Environmental Manager, a BOL will be used to document delivery of excavated soil to a recycling and/or disposal facility. The Applicants will be identified as the generator associated with the BOL and as such, the Applicant or Applicants' representative will stamp and sign each BOL.

2.5.4 Hazardous Waste Manifest

A Hazardous Waste Manifest is a New Jersey-New York-approved form used to track the origin, quantity, composition, transportation and final destination of hazardous waste. Hazardous Waste Manifests will be utilized for shipping of any hazardous wastes. The Applicant will be identified as the Generator. The Applicant or the Project Operations Manager will designate the primary transporter and all continuing transporters, as well as the facility to receive the hazardous waste described on the manifest.

2.5.5 Worker Health and Safety

The Contractor will work with a qualified safety professional who will develop, implement, and supervise the worker Health and Safety Plan. The site-specific worker health and safety program developed by the safety professional will incorporate, at a minimum, the general requirements the Applicants' Health and Safety Plan.

2.5.6 Decontamination of Equipment

Tools and equipment that are to be taken and reused off site will be decontaminated. This requirement is applicable to all tools, heavy machinery, and excavating and hauling equipment used during excavation, stockpiling, and re-handling of contaminated material. An Equipment and Vehicle Decontamination Plan has been prepared for this Project and is included in this EMP as Appendix F.

2.5.7 Dust and Odor Control

A Dust and Odor Control Plan has been prepared for this Project and is included in this EMP as Appendix G.

APPENDIX C

TABLES

TABLE 1

Soil Contamination/Hazardous Site Summary for the NJ-NY Expansion Project

Municipality	Site Name	Site Address	Direct (D)/ Adjacent (A)	Mile Marker	TRC ID No.	Current Facility Type	Soil Contamination Summary Based on Review of Regulatory Files and Available Databases	Presence of Cap or Deed Notice
New Jersey								
Linden	Merck Landfill	Range Road and 1959 Lower Road Rear	A	Before 0.0	NJ 80	Closed solid waste landfill	Solid waste (landfill)	A 2-foot thick soil cap is present in the eastern portion of the Site.
	Buckeye Pipe Line Linden Station Facility	1001 Lower Road	D	0.82 - 1.11	NJ 222	Active pump station and bulk storage facility	There are multiple areas of soil contamination throughout the Site resulting from spills of gasoline, oil, jet fuel, etc. The areas of soil contamination closest to the proposed pipeline in the north tract (most recent data included in Site file from 1993) include PHC impact (max = 2,030 ppm) approximately 160 feet north and down-gradient of the proposed pipeline (most likely resulting from a release from a drainage ditch that runs along the western border of the north tract); and benzene (max = 111 ppm) and xylene (max = 1,475 ppm) impact approximately 140 feet north and down-gradient of the proposed pipeline (as a result of a 1992 gasoline spill - unknown NJDEP Incident No). Soil contamination in the south tract includes xylenes (max = 83 ppm) approximately 130 feet south and down-gradient of the proposed pipeline; and PHCs (max = 324 ppm), benzene (max = 1.6 ppm) and xylenes (max = 2.7 ppm) approximately 200 feet south and down-gradient of the proposed pipeline.	N/A
	Harbor Pipeline Company	1001 Lower Road	D	0.84	NJ 84	Linden Terminal - a portion of the 80-mile long 16-inch diameter Harbor Pipeline System pipeline from Woodbury to Linden, NJ that transports refined petroleum product.	Petroleum-impacted material in various locations throughout the Site was excavated and disposed off-site; currently no soil contamination exists on-site.	N/A
	ExxonMobil Bayway Refinery	1400 Park Avenue	D	0.53 - 0.84 (RRT) and 3.21R - 3.31R (FAL)	NJ 217	Refining facility	**Firefighting Area Landfill (FAL):** Elevated concentrations of targeted compounds detected above their respective NRD SCC in the southern portion of the FAL area near the proposed pipeline included PHCs (max = 110,000 ppm at 4-6 feet bg) and arsenic (max = 120 ppm). Elevated concentrations of other targeted compounds detected further north (at least 400 feet north of the proposed pipeline) in the HFM included lead, zinc, benzene and PAHs. **Rahway River Tank Field (RRT):** Elevated concentrations of targeted compounds detected in the soil above their respective NRD SCC in this portion of the Site included one surficial exceedance of beryllium (approximately 150 ppm) approximately 300 feet south and down-gradient of the proposed pipeline.	FAL = Proposed soil cap and Deed Notice RRT = N/A
	Citgo Petroleum Corp – Linden Terminal	4801 South Wood Avenue	D	1.1 - 1.39	NJ 165	Bulk Storage Facility	A War Emergency pipeline area in Tremley Tank Farm contains PHC-DRO-impacted soil (max = 206 ppm) to a depth of 9-10 feet bg; other tank areas with relatively small areas of contaminated soil are located far from the proposed pipeline.	A Deed Notice and engineering controls have been proposed for the impacted soil area (not near the proposed pipeline).
	American Cyanamid & Chemical Corporation	3301A Tremley Point Road	A	1.84	NJ 108	Warehouse buildings	In addition to the presence of elevated concentrations of BNs and metals typical of HFM, elevated concentrations of benzene (max = 0.94 ppm) and xylenes (max = 71 ppm) were detected near a suspected former UST area.	Site-wide Deed Notice with engineering controls includes pavement, concrete floor slabs in existing buildings, vegetative cover, and an asphalt cap.

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Linden	GAF Chemical	"4000 Road to Grasselli" (Foot of South Wood Avenue)	A	2.08R	NJ 90	Bulk petroleum (motor fuel and heating oil) storage and distribution terminals	**PCBs/Pesticides**: Targeted compounds detected on-site included PCBs (max = 50 ppm) and dieldrin (max = 47 ppm); soil samples collected closest to the proposed pipeline did not contain PCBs or pesticides at concentrations above their respective standards. **VOCs:** Targeted compounds detected on-site (to a depth of 18 feet bg) included chlorobeneze (max = 17,000 ppm), 1,2-dichloroethane (max = 220 ppm), chloromethane (max = 54 ppm), carbon tetrachloride (max = 8.3 ppm), chloroform (max = 120 ppm), benzene (max = 390 ppm), and total xylenes (max = 2,100 ppm). Soil samples collected closest to the proposed pipeline did not contain VOCs at concentrations above their respective standards. Soil samples within the Construction ROW with VOC concentrations that exceeded their respective standards were generally collected from 4-8 feet bg; no surficial impact was detected. **SVOCs:** Targeted compounds detected on-site (generally to a depth of 18 feet bg) included 1,2,4-trichlorobenzene (max = 32,000 ppm), 1,2-dichlorobenzene (max = 11,000 ppm), 1,3-dichlorobenzene (max = 210 ppm), 1,4-dichlorobenzene (max = 810 ppm), hexachlorobenzene (max = 990 ppm), 4-chloroaniline (max = 28,000 ppm), nitrobenzene (max = 25,000 ppm), and phenol (max = 2,300 ppm). PAHs were primarily found within the upper 1 foot of soil throughout the Site, with the exception of naphthalene, which was detected at its greatest concentration (230,000 ppm) from 9-11 feet bg. Soil samples collected closest to the proposed pipeline did not contain concentrations of SVOCs at concentrations above their respective standards. **Metals:** Metals contamination is pervasive throughout the Site (with the highest occurrence and maximum exceedances detected within the top 1 foot of soil) and has included arsenic (max = 5,210 ppm), antimony (max = 504 ppm), beryllium (max = 120 ppm), copper (max = 15,100 ppm), lead (max = 42,100 ppm), mercury (max = 1,810 ppm), nickel (max = 2,410 ppm), thallium (max = 17.2 ppm), and zinc (max = 26,000 ppm). Exceedances of metals in the western portion of the Site included arsenic (max = 62.6 ppm), beryllium (max = 6.2 ppm), and thallium (max = 3.5 ppm). Surficial metals contamination detected at the Site in the Construction ROW area included beryllium (max = 113 ppm), copper (max = 9,730 ppm), antimony (max = 504 ppm), lead (max = 10,200 ppm), and zinc (max = 25,200 ppm). **Chromium:** Exceedances (assumedly total chromium) were detected throughout the Site soil and varied by depth interval including surficial samples (max = 5,410 ppm), 2-10 feet bg (max = 22,300 ppm), and 10-14 feet bg (max = 27,700 ppm); chromium was detected in the western portion of the Site (max = 317 ppm).	A site-wide cap, present above former on-site landfills, comprises at least 6 inches of clean fill and 4 to 6 inches of crushed stone. A Deed Notice around the majority of the Site was established in 2005.
New York								
Staten Island	Former GATX Terminal	500 Western Avenue	D	3.57R - 3.64R & 4.10R - 4.13R	NY 17	Vacant (former petroleum bulk storage facility)	Residual/low concentrations of VOCs, SVOCs and metals may be present in soil and sediment at the Site. A portion of the proposed pipeline is located in a wetland/canal area with petroleum-contaminated soil and free-phase product which is currently being remediated.	The placement of a minimum of 3 feet of clean NYSDEC-approved fill is proposed at the Site to raise the property elevation to a 100-year flood level and to cover residual-contaminated soil; this area includes the proposed pipeline route. A site-wide Conservation Easement/deed restriction will likely be issued.
	Coca Cola Enterprises	400 Western Avenue	A	4.84R	NY 7	Coca Cola Enterprise warehouse and distribution facility	Previous UST-related soil contamination; according to information in the Site file, "no residual soils contamination" remains at the Site.	N/A
	Procter & Gamble Manufacturing Company	40 Western Avenue	D	4.74R	NY 6	Container terminal and intermodal facility	LNAPL and elevated concentrations of PHCs and metals above their respective standards were detected in the northeastern and southwestern portions of the Site; these areas are transected by the proposed pipeline. HFM is expected to be encountered during pipeline installation activities at/near the Site. The Port Authority is currently remediating LNAPL and other petroleum impacts.	A site-wide Deed Notice and a 1-foot thick soil cap have been proposed for this property.
New Jersey								
Bayonne	Former Texaco Terminal & Pirelli Cable Co.	35 Avenue A and 247-251 West 1st Street	D	7.11R - 7.45R	NJ 1	Vacant (former Texaco Terminal & Pirelli Cable Co.)	On-site impact includes PHCs and lead in the Texaco portion of the Site and lead in the Pirelli portion of the Site. In addition, isolated hotspots of PCBs & PAHs were detected in soil in the Pirelli portion of the Site; however, no sampling locations or analytical data were included in the Site file.	Based on current aerial photographs, a cap has been installed over the majority of the Pirelli portion of the Site (i.e., adjacent to the proposed pipeline and construction ROW); no further information was included

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								in the Site file.
	Point Builders	197-199 West 1st Street and J.F. Kennedy Boulevard	A	7.77	NJ 4	Vacant	The closest soil samples collected near the proposed pipeline contained PHCs; PCBs; and metals including arsenic, chromium, copper and lead. No further sampling activities or delineation data were included in the Site file.	N/A
	Bayonne Terminal (former Mobay Corp)	East 2nd Street and Hobart Avenue	D	8.43R - 8.58R	NJ 11	Former brickyard, boiler manufacturer, munitions manufacturer; prisoners of war encampment, and bulk storage terminal	Surface and subsurface soils are impacted by metals and petroleum. In addition, VOCs have been detected in soil samples throughout the Site. HFM, present throughout the Site from 2 to 12 feet bg, comprises cinders, brick, concrete wood and debris and contains metal contamination typical of HFM.	N/A
	Bayonne Sewage Treatment	Foot of Oak Street	A	9.18 - 9.51	NJ 16	Sewage pretreatment facility	Chromium contamination is site-wide (max total chromium = 3,900 ppm; max hexavalent chromium = 15 ppm); soil sampling depths were not included in the Site file.	N/A
	IMTT Bayonne – Packards Yard and Old Yard 4	Old Yard 4: Route 440 - South of East 19th Street and Avenue F Packards Yard: Foot of East 22nd Street	D	9.49 - 10.01	NJ 20	Bulk petroleum liquid terminal, providing storage and transportation shipment services for fuel and fuel-related products	Free-phase product is present in both Site areas, but has not been delineated.	N/A
	Kenrich Petrochemical / Chromate Site 152	140 East 22nd Street	D	10.00 - 10.04	NJ 22	Rubber chemical additive production facility, including other petroleum-based product intermediates	PHC-impacted soil (max = 57,300 ppm) appears to be located down-gradient of the proposed pipeline and is not expected to be encountered during pipeline installation activities near the Site (although the western-adjoining potentially PHC-impacted property [TRC ID No. 20] may adversely impact the proposed pipeline west of the Site). Three soil samples were collected for chromium analysis along the northern Site boundary including one near the northwestern corner; trivalent chromium was detected in one sample (277 ppm).	N/A
	NJDOT Route 169, Sections 2D and 1E	Road Segment Route 440 from East 14th Street / 5th Street Connection (south) to East 32nd Street (north)	D	10.04 - 10.85	NJ 28	1.1 mile length of Route 169	The following targeted compounds were detected above their most stringent NJDEP cleanup standards in the soil throughout the Site (max concentrations shown in ppm within parentheses after each compound): PHCs (65,000); benzene (2.7); PCE (2.8); TCE (11); 1,1,2,2-PCA (95); pyridine (0.068); antimony (106); arsenic (630); copper (5,340); lead (2,730); total PCBs - Arochlor 1016 (0.109), Arochlor 1258 (11), Arochlor 1254 (52), and Arochlor 1260 (0.64); n-nitroso di-n-propylamine (2.7); napthalene (12); diethylphthalate (0.110); 2,4-dinitrotoluene (2.9); benzo(a)anthracene (29); bis(2-ethyl hexyl)phthalate (40); benzo(b)fluoranthene (20); benzo(k)fluoranthene (20); benzo(a)pyrene (19); dibenzo(a,h)anthracene (2); and indeno(1,2,3-cd)pyrene (7.3). HFM is expected to be encountered during pipeline installation activities at/near the Site.	N/A
Bayonne	Route 169, Section 1G	Route 169, Section 1G; Route 185 and 30th Street (between 30th Street and Harbor Avenue)	D	10.78 - 11.39 & 12.85 - 12.96	NJ 24	1.5-mile length of Route 169	PHCs, metals, PCBs, PAHs and BN contamination present throughout the length of the Site.	An asphalt-paved roadway and/or a 2-foot thick soil cap is present at the Site. A site-wide Deed Notice (for Site soils above their respective NJDEP NRD standards) was proposed.
	34th Street Station Park and Ride	Foot of East 32nd Street	A	10.96 - 11.18	NJ 91	Paved parking lots for the 34th Street Station Park & Ride	Soil samples collected from unknown depths near the former railroad spurs (located approximately 260 feet up-gradient of the proposed pipeline) in 1995 were analyzed for PHCs and TAL metals; exceedances of arsenic (max = 300 ppm), lead (max = 760 ppm), thallium (max = 4.3 ppm), and zinc (max = 6,200 ppm) were detected in two samples.	N/A

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	Military Ocean Terminal Bayonne (MOTBY)	Port Terminal Road; Foot of East 32nd Street	D	11.05 - 11.99	NJ 25	Mixed use redevelopment project	On-site contamination includes PCBs, sulfuric acid, waste oils, gasoline and various solvents. Contamination near the proposed pipeline includes low concentrations of PHCs and PAHs in the North Fill area (max PHCs = 13,000 ppm at 7 feet bg); and metals including arsenic (max = 62 ppm), copper (max = 739 ppm), lead (max = 867 ppm), and zinc (max = 3,400 ppm) at 4-5.5 feet bg.	A former landfill area is covered by a 24-inch thick permeable soil cap comprising 18 inches of clean structural fill and 6 inches of clean topsoil. Two areas located along the western portion of the Site are capped with a 2-foot thick soil cap; one area is asphalt-paved. A Deed Notice is present in the northwestern portion of the Site; the proposed pipeline transects the Deed Noticed area.
	Port Jersey Logistics	Route 169 & Pulaski Street	A	11.76R	NJ 27	Former radiator manufacturer, grocery product warehouse/distributer, truck repair facility, construction equipment storage facility, and US Army/Navy Marine Ocean Terminal. Current on-site operations unknown.	Site impact includes PAHs (max = 21,400 ppm), arsenic (max = 49.1 ppm), lead (max = 8,690 ppm), zinc (max = 6,240 ppm), and PCBs (max = 7.38 ppm) and is attributed to HFM present throughout the Site at depths between 0.5 and 15 feet bg.	Site-wide Deed Notice and asphalt cap.
Jersey City	Greenville Yards	100 Summit Place, 100 Polar Way, 200 Polar Way, 100 Industrial Drive and 25 Colony Road	A	12.64 - 12.83	NJ 31	Warehouses	Impact typical of HFM is present throughout the Site and includes benzo(b)fluoranthene (max = 1.40 ppm), benzo(a)pyrene (max = 1.100 ppm), lead (max = 764 ppm), and arsenic (max = 20.4 ppm).	A Site-wide impervious asphalt/concrete cap is underlain by two feet of clean fill.
Jersey City	Linden East Chromate Site #16	45 East Linden Avenue	A	13.31 - 13.50	NJ 36	Clothing warehouse	The Site is located in an area that was filled with chromium-impacted material to a depth of at least 6 feet bg (total chromium max = greater than 100 ppm at varying depths). Hexavalent chromium (84 ppm) was detected in one soil sample collected at a depth of 6 feet bg in the southeastern portion of the Site (over 600 feet southeast of the proposed pipeline). Chromium-impacted soil may be encountered along Caven Point Road at concentrations above its NJDEP most stringent standard.	Asphalt paving was installed in the northeastern portion of the Site, adjacent to the building, and approximately 30 feet southeast of the proposed pipeline, to prevent possible COPR exposure; a site-wide Deed Notice exists for this property.
	Caven Point US Army Reserve Center	Chapel Avenue and Caven Point Road	D	13.68R - 14.19	NJ 37	US Army facility (troop readiness and small vehicle maintenance)	Site impact includes PHCs, PAHs, metals (including arsenic, beryllium, nickel and lead), and PCBs (related to a transformer area only). On-site contamination near the proposed pipeline is associated with HFM in the Site area.	A Deed Notice and two-foot thick clean soil cap is present in the central portion of the Site.
	Group 5 Chromium Sites / Ultramar	80 Caven Point Road (NJDEP Site Nos. 2 through 4); 90 Caven Point Road (NJDEP Site Nos. 05 and 66)	D	14.29 - 14.75	NJ 49	Located within a portion of the Liberty National Golf Course (formerly contained oil refining facilities, warehouses, industrial operations, truck storage and trailers)	On-site impact includes total and hexavalent chromium, COPR, PHCs and free-phase product.	Portions of the Site are capped with an HDPE liner and a 2-foot layer of clean soil is present site-wide. A site-wide Deed Notice exists for this property.
	Orphan Chrome Group II Site 198	Adjacent to 99 Caven Point Road	A	14.46	NJ 48	Warehouse buildings	Elevated metal concentrations include arsenic, lead, beryllium, zinc and copper. Additionally, hexavalent chromium was detected in one boring at two feet bg (51 ppm) and 8 feet bg (13 ppm). A “petroleum-related release” with a “gasoline odor” occurred in the southwestern portion of the Site; a soil sample was collected, although no sampling parameters or analytical results were included in the Site file.	N/A

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Jersey City	Streichler Trucking	100 Caven Point Road	D	14.77 - 14.8R	NJ 52	Currently "The Residences at Liberty", adjacent to the Liberty National Golf Course (formerly part of the Eagle Works Refinery and National Docks rail yards, truck and trailer storage)	Subsequent to remedial activities at the Site, remaining on-site impact in a "depositional area" ("Area G", located southeast of the proposed pipeline) includes arsenic, antimony, cadmium, copper, lead, nickel, zinc, PAHs, PCBs, benzene, PCE and PHCs. Other Site areas (i.e., along the proposed pipeline route) contain PAH and PHC impact only.	A site-wide Deed Notice and 2-foot thick clean soil cap exists at this property.
	Chromate Sites Nos. 63 & 65/Caven Point Road and Burma Road	Caven Point Road and 1 Burma Road	D	14.8R - 14.96	NJ 54	Vacant (formerly contained railroad tracks, Baldwin Oils and Commodities, Inc. - repackaging and distribution of solvents [thinners])	Chromium contamination at the Site has likely been addressed by soil excavation; however, no post-excavation sampling data were included in the Site file. Additionally, VOCs were detected in excavated material. Soil samples were collected by the NJDEP throughout the Site for chromium analysis; chromium was detected above the standard (max = 3,150 ppm), although it is unclear what chromium concentrations were detected near the proposed pipeline. No information regarding soil sampling for hexavalent chromium analysis was included in the Site file.	On-site engineering controls at this property include a 30-mm PVC liner, a concrete and PVC-lined drainage ditch, and a 60-mm HDPE liner.
	NJ Turnpike Authority Maintenance Facility	NJ Turnpike Mile Marker 5.5	A	14.87R - 15.00	NJ 55	NJ Turnpike Maintenance Facility	One on-site well contained 2.8 feet of free-phase product during a sampling event sometime between 1990 and 1994; however, no product has subsequently been observed in on-site wells.	N/A
	Polarome International / Hudson County Chromate Site No. 206	200 Theodore Conrad Drive	D	15.02	NJ 56	Office space, material processing, warehouse, shipping/receiving and laboratory	Chromate waste may have been used as fill material during the construction of the original sewer system connection near the Site; one soil sample collected approximately 10 feet from the proposed pipeline contained hexavalent chromium (170 ppm).	N/A
	Gateway Park & Ride	20 Caven Point Avenue	A	15.23	NJ 92	Paved parking areas (Gateway Park & Ride), administrative offices, and maintenance facilities	Low concentrations of PAHs and metals typical of HFM were detected throughout the Site; HFM was also detected in soil samples collected in the surrounding Site area.	The Site is capped with 18-20 inches of asphalt paving.
	Phillip Street Chromate Site No. 19	Phillip Street Junction, adjacent to Route 78	A	15.22 - 15.66	NJ 58	Site contains sewer interceptor conveyance corridors, soil/debris piles, railroad tracks, crushed stones and vegetated areas	HFM is present throughout the Site from grade to 18 feet bg; no information was available regarding deeper soils. Hexavalent and total chromium were identified throughout the Site at maximum concentrations of 12,900 ppm and 27,200 ppm, respectively.	N/A
	Chromate Site #093 – Northeast Interceptor 3	Intersection of Communipaw Avenue and Phillip Street	D	15.46 - 15.64	NJ 60	Sewage Treatment Plant	Exceedances of total and hexavalent chromium were detected in two soil borings and one test pit (total and hexavalent chromium max = 403 ppm and 43.1 ppm, respectively). The closest soil boring with elevated chromium concentrations was located approximately 40 feet south and down-gradient of the proposed pipeline (26.6 ppm); the majority of the chromium impact and the soil samples with the highest chromium concentrations were generally located in the southeastern portion of the Site approximately 400 feet south and down-gradient of the proposed pipeline. Chromate waste material was only noted in one of the test pits between 6 and 7 feet bg in the southeastern portion of the Site. Other detected exceedances in the soil samples collected throughout the Site included antimony (max = 1,490 ppm), arsenic (max = 29.2 ppm), barium (max = 753 ppm), beryllium (max = 2.2 ppm), and lead (max = 21,900 ppm); antimony and lead were generally detected in the southeastern portion of the Site. Petroleum-like odors and elevated PID readings were recorded in several borings and test pits within the top 10 feet bg of soil in the northwestern portion of the Site; no additional sampling data were included in the Site file.	N/A

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Soil Contamination/Hazardous Site Summary for the NJ-NY Expansion Project

Municipality	Site Name	Site Address	Direct (D)/ Adjacent (A)	Mile Marker	TRC ID No.	Current Facility Type	Soil Contamination Summary Based on Review of Regulatory Files and Available Databases	Presence of Cap or Deed Notice
	NJTPK at Communipaw Chromate Site #7	NJ Turnpike and Communipaw Avenue	D	15.61 - 15.66	NJ 61	The New Jersey Turnpike runs through the central portion of the Site; the northwestern portion of the Site contains a railroad line, vegetation and wetlands; and the southeastern portion of the Site contains a building owned by Jersey City (unknown use) and vacant vegetated land	Total and hexavalent chromium were detected in the soil throughout the Site. Visible chromate waste was identified at the Site to a depth of 25 feet bg; detectable concentrations of hexavalent chromium were identified to depths of 32 feet bg. Additionally, antimony (max = 282 ppm), copper (max = 855 ppm), lead (max = 717 ppm), nickel (max = 444 ppm), thallium (max = 2.1 ppm), and vanadium (max = 814 ppm) were detected at concentrations above their respective NJDEP most stringent standards, primarily in the 3-6 foot bg interval - these borings were all at least 190 feet northwest of the proposed pipeline. Based on these data, chromium-impacted soil is expected to be encountered during pipeline installation activities at/near the Site.	N/A
Jersey City	Hudson County Chromate No. 91 / Interceptor No. 1	South from the west end of Aetna Street	D	16.03 - 16.32	NJ 67	Inactive lead-alloy metal-smelting facility and warehouse	Targeted compounds detected at concentrations above their respective standards in soil closest to the proposed pipeline (approx. 150 feet up-gradient) include metals (including total and hexavalent chromium), PAHs and PCBs.	N/A
	Former Frank B. Ross Facility	4-10 Ash Street	A	16.25	NJ 136	Vacant	On-site soil has been impacted by chlorinated compounds and PHCs.	A proposed asphalt/concrete cap underlain by clean fill was to be constructed concurrently with planned on-site residential development. According to a 2009 NJDEP letter, a site-wide NFA determination will be issued pending filing of a Deed Notice. The status of the cap and Deed Notice is unknown.
	PSE&G Pacific Avenue & Grand Street	427-451 Grand Street	A	16.34R	NJ 106	PSE&G switching station	Targeted compounds detected at the Site at concentrations above their respective most stringent NJDEP standards in surficial soil samples included PHCs (max = 1,540 ppm), PCBs (max = 8.5 ppm), cadmium (max = 5.89 ppm), copper (max = 307 ppm), lead (max = 1,104 ppm), thallium (max = 12.73 ppm), and zinc (max = 2,300 ppm). Targeted compounds detected at the Site at concentrations above their respective most stringent NJDEP standards in deeper soil samples (approximately 6 feet bg) included PHC (max = 1,290 ppm), lead (max = 746 ppm), thallium (max = 7 ppm), and zinc (364 ppm).	The Site is capped with an impermeable geosynthetic clay liner.
	Lafayette Senior Living Center	463 Pacific Avenue	A	16.37R	NJ 173	Senior Living Center	15 Soil samples collected throughout the Site contained elevated concentrations of PHCs (max = 858 ppm) and targeted compounds typical of HFM including arsenic (max = 24 ppm), lead (max = 6,000 ppm), benzo(a)anthracene (max = 1,600 ppm), benzo(a)pyrene (max = 1,500 ppm), benzo(b)fluoranthene (max = 1,800 ppm), benzo(k)fluoranthene (max = 1,000 ppm), and indeno(1,2,3-cd)pyrene (max = 0.940 ppm).	A site-wide cap comprises landscaped areas with 1 foot of certified clean fill (with pavers in some areas), building cover, and asphalt/concrete paving.
	Sunoco #0006-9583	465 Grand Avenue and Pacific Avenue	A	16.42R	NJ 69	Gasoline filling station	Benzene (max = 19,000 ppm) and lead (max = 11,569 ppm) are present throughout the Site; maximum concentrations were detected in the 5-6 feet bg interval.	N/A
	Lafayette Village Residential Development	579 Grand Street	A	16.48	NJ 170	Public Housing area	In June 2000, approximately 2,055 cubic yards of soil and fill material contaminated with elevated concentrations of metals (antimony, barium, copper, lead and zinc), PAHs and PCBs was excavated and replaced with certified clean fill. Post-excavation soil samples were collected and PAHs (max = 1.1 ppm) and PCBs (max = 2 ppm) were detected at concentrations slightly above their respective NJDEP RDCSCC.	On-site engineering controls at this property comprise a 6-inch thick soil cap, concrete slabs/sidewalks, and pavement sections consisting of at least two inches of asphalt with a two-inch thick sub-base. A 20-mil thick high-density polyethylene (HDPE) liner is installed beneath the concrete floor slab of each building. A Deed Notice was issued for the on-site soils in February 2003.
	Consolidated Rail Corporation	165 feet west of Montgomery Street and Chopin Court	A	16.75R	NJ 73	Railroad	PHC- and PAH-impacted soil around former USTs was excavated; subsequent soil sampling identified contaminants and concentrations typical of HFM.	The Site contains a clean stone cap underlain by a geotextile fabric layer.

TABLE 1

Soil Contamination/Hazardous Site Summary for the NJ-NY Expansion Project

Municipality	Site Name	Site Address	Direct (D)/ Adjacent (A)	Mile Marker	TRC ID No.	Current Facility Type	Soil Contamination Summary Based on Review of Regulatory Files and Available Databases	Presence of Cap or Deed Notice
Jersey City	James J Ferris High School	35 Colgate Street	A	16.75R	NJ 72	High school complex	Impacted soil (PHCs - max = 2,167 ppm) identified during the removal of several on-site USTs was excavated and disposed off-site. Soil impact identified during several subsequent remedial investigations includes several PAHs typical of HFM at depths between 4 and 8 feet bg.	A DER (2,372 square feet) for PAHs in soils exists for this property.
	Van Leer Chocolate Co.	110 and 127-135 Hoboken Avenue	D	17.73 - 17.86	NJ 75	Vacant (former herbicide, paint, and lacquer manufacturing; waterproof brick seal and soap manufacturing; Van Leer Chocolate Co.; Standard Oil gasoline station and oil storage facility, and possibly a petroleum or chemical refinery; oil and grease manufacturing facility; and chocolate manufacturing)	COCs at the Site include arsenic (primarily), VOCs, BNs and other metals.	A site-wide deed notice has been proposed for this property.
	Troy Lighting, Inc.	833 Jersey Avenue	A	17.94 - 18.0	NJ 76	Vacant building (former automobile parts warehouse)	Soil contamination detected at the Site comprises HFM-related contaminants including PHCs, PAHs and lead.	A HFM-related site-wide cap (building and parking lot) and Deed Notice for arsenic, cadmium, lead and zinc exist at this property.
	Hoboken Rail Yard	688 Luis Munoz Boulevard	D	18.27R - 18.72R	NJ 157	Former rail yard, currently used as a commuter terminal for rail, bus and ferry operations	Elevated concentrations of BNs and metals typical of HFM (and also attributed to former railroad maintenance operations) were detected in the unsaturated zone throughout the Site (soil samples were indistinguishable from HFM).	N/A
	NJ Transit Fueling Station	Southeast Corner of Marin Boulevard and 18th Street	A	18.28R	NJ 175	Asphalt-paved parking lot (former fueling station)	Two UST removal post-excavation soil samples collected at 6.5 feet bg for PHC, VOC and lead analyses contained PHC concentrations exceeding the NJDEP action level of 10,000 ppm (18,000 ppm and 13,000 ppm, respectively) and benzene above the NJDEP impact to GW standard of 1 ppm (2 ppm and 3.2 ppm, respectively). Lead was not detected at concentrations above its NJDEP standard. PHC-impacted soils around the former UST were excavated to a depth of approximately 6.5 feet bg, approximately 370 feet south and down-gradient of the proposed pipeline (unknown total area), and disposed off-site. Despite the post-excavation samples containing exceedances of targeted compounds, the excavation was then backfilled with certified clean fill.	N/A
	NJ Transit Group 6	Corridor from Hudson Street, along Washington Street, to Observer Highway	D	18.28R - 18.31	NJ 93	Segment of the Hudson-Bergen Light Rail Transit System	Low concentrations of PAHs and metals typical of HFM are present in Site soils near the proposed pipeline.	N/A
New York								
Manhattan	Superior Printing Ink Co.	394-400 West 12th Street, 58-70 Bethune Street and 469-485 West Street	A	20.04	NY 22	15-story residential building	Several SVOCs and metals typical of HFM (including chromium, copper, iron, nickel, zinc, beryllium, mercury, calcium and magnesium) were detected throughout the Site at concentrations above their respective standards. Total chromium was detected at the Site at elevated concentrations above the RSCO in 21 soil samples (max = 47.1 ppm).	N/A
	383 West 12th Street	384 West 12th Street	A	20.04	NY 24	Seven-story apartment building	Approximately two gallons of #4 fuel oil was released onto soil in an excavation in the northeastern portion of the Site (exact location unknown). Oil was not observed elsewhere on-site by the NYSDEC. No further information was included in the Site file.	N/A

TABLE 1

Soil Contamination/Hazardous Site Summary for the NJ-NY Expansion Project

Municipality	Site Name	Site Address	Direct (D)/ Adjacent (A)	Mile Marker	TRC ID No.	Current Facility Type	Soil Contamination Summary Based on Review of Regulatory Files and Available Databases	Presence of Cap or Deed Notice
	777-781 Washington Street	777-781 Washington Street	A	20.04	NY 107	Vacant lot (development of three-story residential building proposed)	Based on a 2008 soil boring figure, petroleum odors and free product was observed in soil borings that extended from the western Site boundary to at least the central portion of the Site.	N/A
	NYCT Hudson Depot – Pier 57	25-29 11th Avenue	A	20.04	NY 124	Vacant (former New York City Transit bus depot)	On-site soil impact includes SVOCs (PAHs) and residual contamination including product (diesel) and low-concentration VOCs (dissolved-phase) to approximately 15 feet bg; the approximately 4,000-square foot impacted area is located approximately 1,500 feet north-northeast of the proposed pipeline.	N/A

Abbreviations

bg = Below grade
BN = Base neutral detectable organic compound
COC = Contaminant of concern
COPR = Chromite Ore Processing Residue
CVOC = Chlorinated Volatile Organic Compound
DCA = Dichloroethane
DCE = Dichloroethene
DRO = Diesel Range Organics
GW = Ground water
GWQS = Ground Water Quality Standard
HDPE = High Density Polyethylene
HFM = Historic fill material
LNAPL = Light non-aqueous-phase liquid
max = maximum
mm = millimeter
MTBE = Methyl tert-butyl ether
NFA = No Further Action
NJDEP = New Jersey Department of Environmental Protection
NYSDEC = New York State Department of Environmental Conservation
NRD = Non-residential
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated biphenyl
1,1,2,2-PCA = Tetrachloroethane
PCE = Tetrachloroethene
PHC = Petroleum hydrocarbon
PID = Photoionization detector
ppm = Parts per million
RDCSCC = Residential Direct Contact Soil Cleanup Criteria
ROW = Right-of-way
RSCO = Recommended Soil Cleanup Objective
SCC = Soil Cleanup Criteria
SVOC = Semi-Volatile Organic Compound
TAL+30 = Target Analyte List (plus 30 compound library search)
TBA = Tertiary butyl alcohol
TCE = Trichloroethene
UST = Underground Storage Tank
VC = Vinyl Chloride
VOC = Volatile Organic Compound

TABLE 2

Sites with Potentially Contaminated Groundwater Crossed by the NJ-NY Expansion Pipeline

Project Facility, Site Name	MP Begin	Crossing Distance (feet)	Municipality	State	Contaminants a/
Pipeline Facilities					
42-Inch Take-up/Relay Pipeline					
Exxon Mobil Bayway Refinery	0.68	2,040	Linden	NJ	Firefighting Area Landfill = product in area of pipeline; wells located approximately 350 feet north of proposed pipeline contain benzene, volatile alcohol n-butanol, 2-butanone, TBA, acetone and n-butanol in the shallow aquifer; and bromodichloromethane and dibromochloromethane in a bedrock well. Arsenic, zinc and aluminum in shallow wells in proposed pipeline area. Rahway River Tank Field (not direct to pipeline route) = 1,2-DCA and 1,2-DCE.
Buckeye Pipe Line Linden Station Facility	0.82	1,500	Linden	NJ	Free-phase product and benzene, ethylbenzene, MTBE, toluene, xylenes, methylene chloride, TBA and lead.
Harbor Pipeline Co.	0.86	185	Linden	NJ	Benzene
Former GATX Terminal	3.62R	1,350	Staten Island	NY	VOCs, SVOCs and metals
Procter & Gamble Manufacturing Company	4.74R	3,300	Staten Island	NY	SVOCs (primarily PAHs), metals and LNAPL.
30-Inch Pipeline					
Procter & Gamble Manufacturing Company	4.74R	3,300	Staten Island	NY	SVOCs (primarily PAHs), metals and LNAPL.
Former Texaco Terminal & Pirelli Cable Company	7.12R	1,730	Bayonne	NJ	Benzene, MTBE, TCE, VC, TBA, lead, ammonia and arsenic.
Bayonne Terminals, Inc.	8.44R	1,700	Bayonne	NJ	VOCs
IMTT Bayonne – Packards Yard/Old Yard 4/Yard 6	9.44	4,550	Bayonne	NJ	Free-phase product, benzene and TBA.
NJDOT Route 169, Sections 2D and 1E	10.04R	3,900	Bayonne	NJ	Free-phase product/petroleum sheen, benzene, 1,1,2,2,-TCA, toluene, ethylbenzene, total xylenes, naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene and PHCs.
Route 169, Section 1G, Bayonne	10.78	2,500	Bayonne	NJ	Free-phase product, benzene, ethylbenzene, toluene, arsenic, beryllium, lead and nickel.
Group 5 Chromium Sites / Ultramar	14.29R	2,500	Jersey City	NJ	Free-phase product, total and hexavalent chromium, COPR and PHCs.
Streichler Trucking	14.77	300	Jersey City	NJ	Free-phase product, PCE, benzene and arsenic.
Chromate Sites Nos. 63 & 65/Caven Point Road and Burma Road	14.87R	620	Jersey City	NJ	Toluene, xylenes, and analine
Van Leer Chocolate Co	17.72R	800	Jersey City	NJ	Free-phase product, VOCs, BNs

TABLE 2

Sites with Potentially Contaminated Groundwater Crossed by the NJ-NY Expansion Pipeline

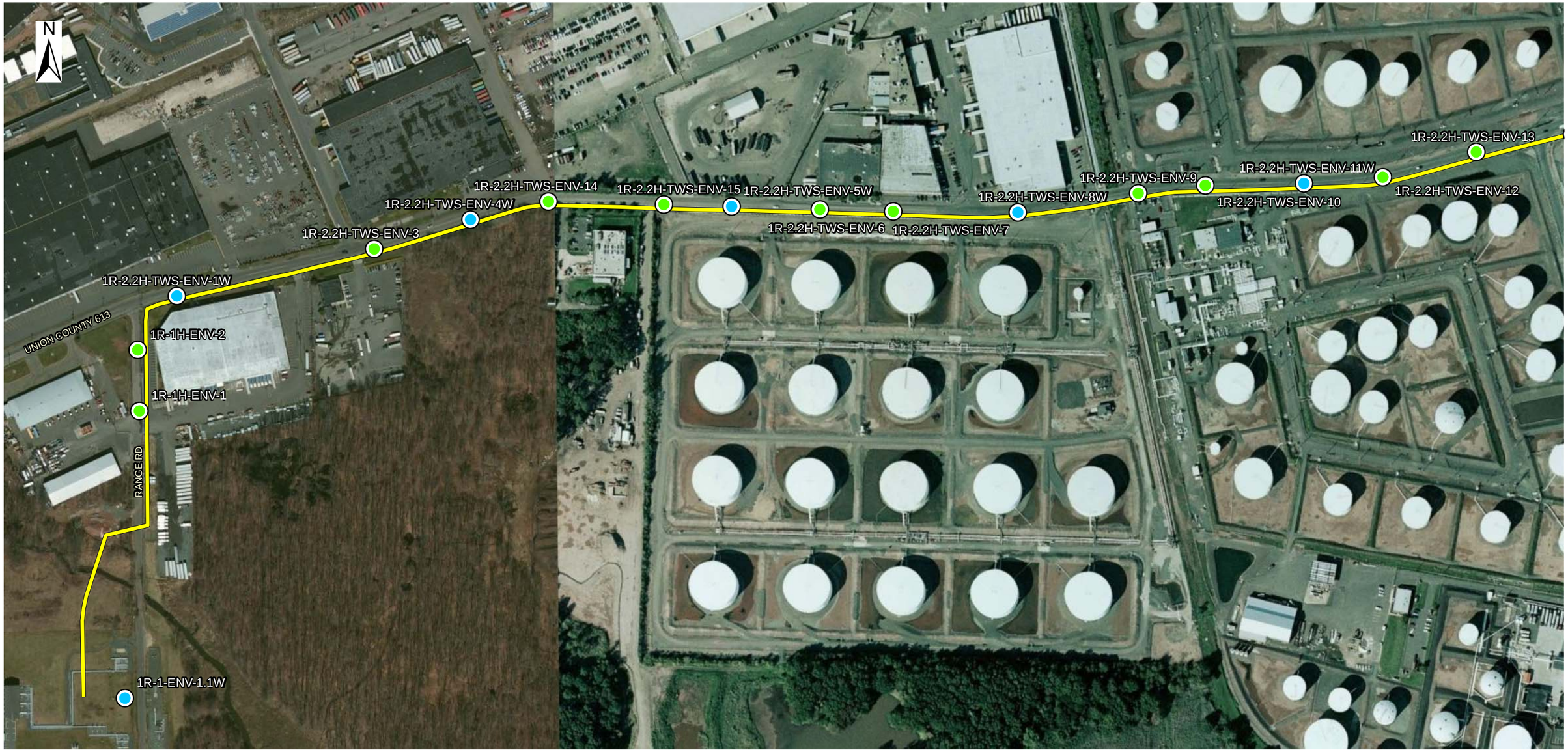
Project Facility, Site Name	MP Begin	Crossing Distance (feet)	Municipality	State	Contaminants a/
					typical of HFM, arsenic, cadmium, chromium, lead, nickel and zinc.
18th Street Sewer	17.92R	415	Jersey City	NJ	Aluminum, antimony, arsenic, iron, lead, manganese and sodium.
Hoboken Rail Yard	18.27R	2,300	Hoboken	NJ	LNAPL, benzene, fluorene, pyrene, arsenic, cadmium and lead. Known locations of impacted GW are present at least 70 feet from the proposed pipeline (benzene); other COCs include PAHs, cadmium and lead at least 100 feet from the proposed pipeline, and arsenic at least 450 feet from the proposed pipeline.

a/ Abbreviations:

BTEX = Benzene, Toluene, Ethylbenzene and Xylene
BN = Base Neutrals
COC = Contaminant of Concern
COPR = Chromate ore processing residue
CVOC = Chlorinated Volatile Organic Compound
DCE = Dichloroethylene
HFM = Historic Fill Material
LNAPL = Light non-aqueous-phase liquid
MTBE = Methyl tert-butyl ether
PAH = Polycyclic Aromatic Hydrocarbon
PCE = Tetrachloroethylene
PHC = Petroleum Hydrocarbon
SVOC = Semi-Volatile Organic Compound
TBA = Tertiary butyl alcohol
TCA = Tetrachloroethane
TCE = Trichloroethylene
TICs = Tentatively Identified Compounds
VC = Vinyl Chloride
VOC = Volatile Organic Compound

APPENDIX D

MAPPING AND DATA RESULTS COLLECTED AS OF MARCH 2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
LINDEN, NJ

FIGURE 1

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Linden Map_1.mxd Date: 4/13/2012

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

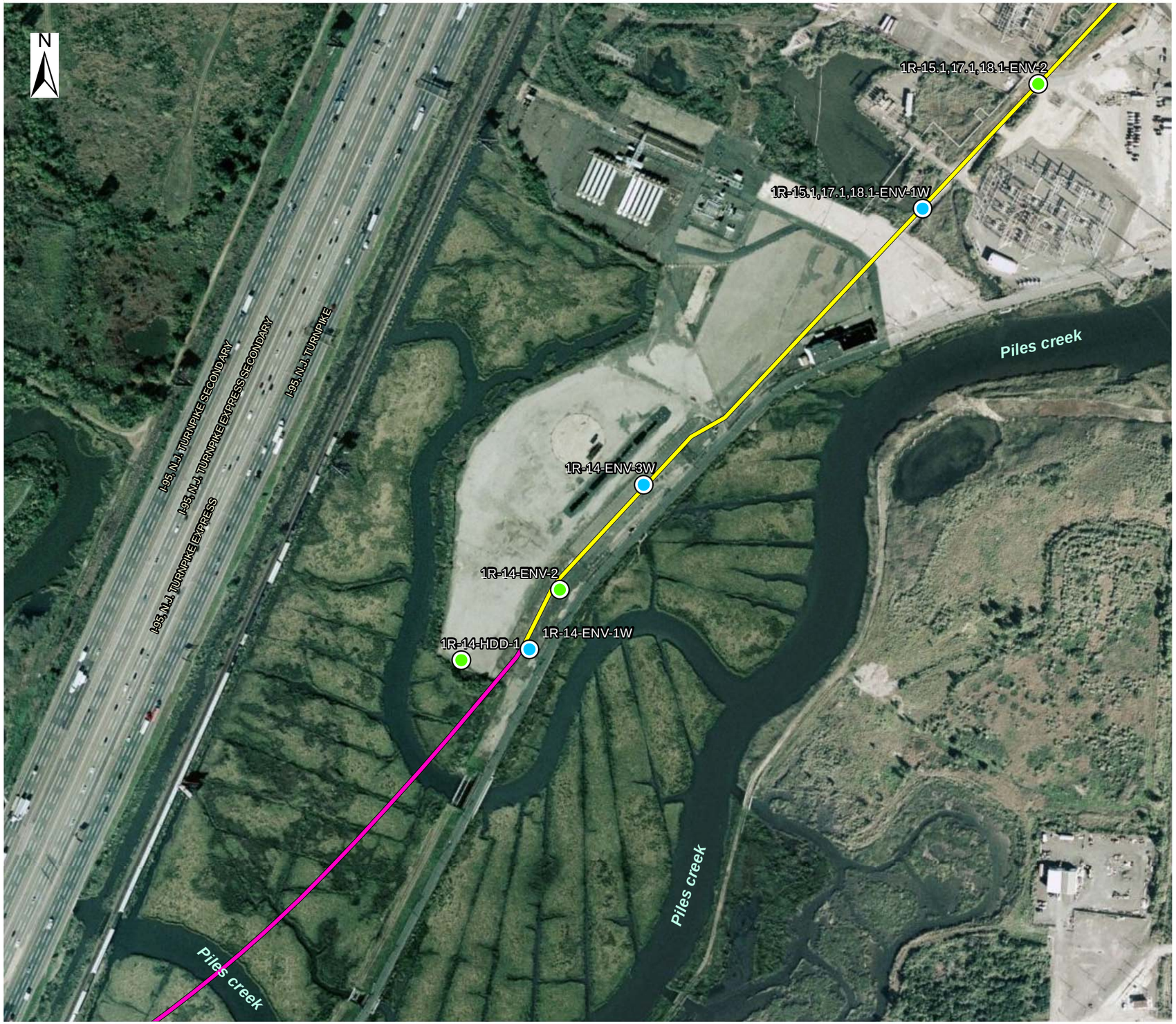
Spectra Energy

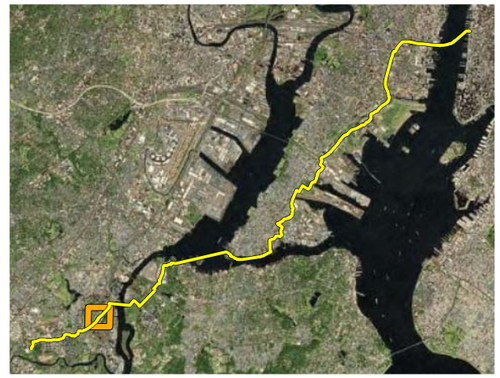
SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
LINDEN, NJ

FIGURE 2

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Linden Map_2.mxd Date: 4/12/2012





Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
LINDEN, NJ

FIGURE 3

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Linden Map_3.mxd Date: 4/12/2012

N

Arthur Kill

Linden

Staten Island

1R-15.1,17.1,18.1-ENV-5W
1R-15.1-HDD-1
1R-15.1,17.1,18.1-ENV-4
1R-15.1,17.1,18.1-ENV-3W
1R-22.1-ENV-5
1R-22.1H-ENV-1W
1R-22.1-ENV-4
1R-22.1-ENV-3W
1R-22.1-ENV-6W

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

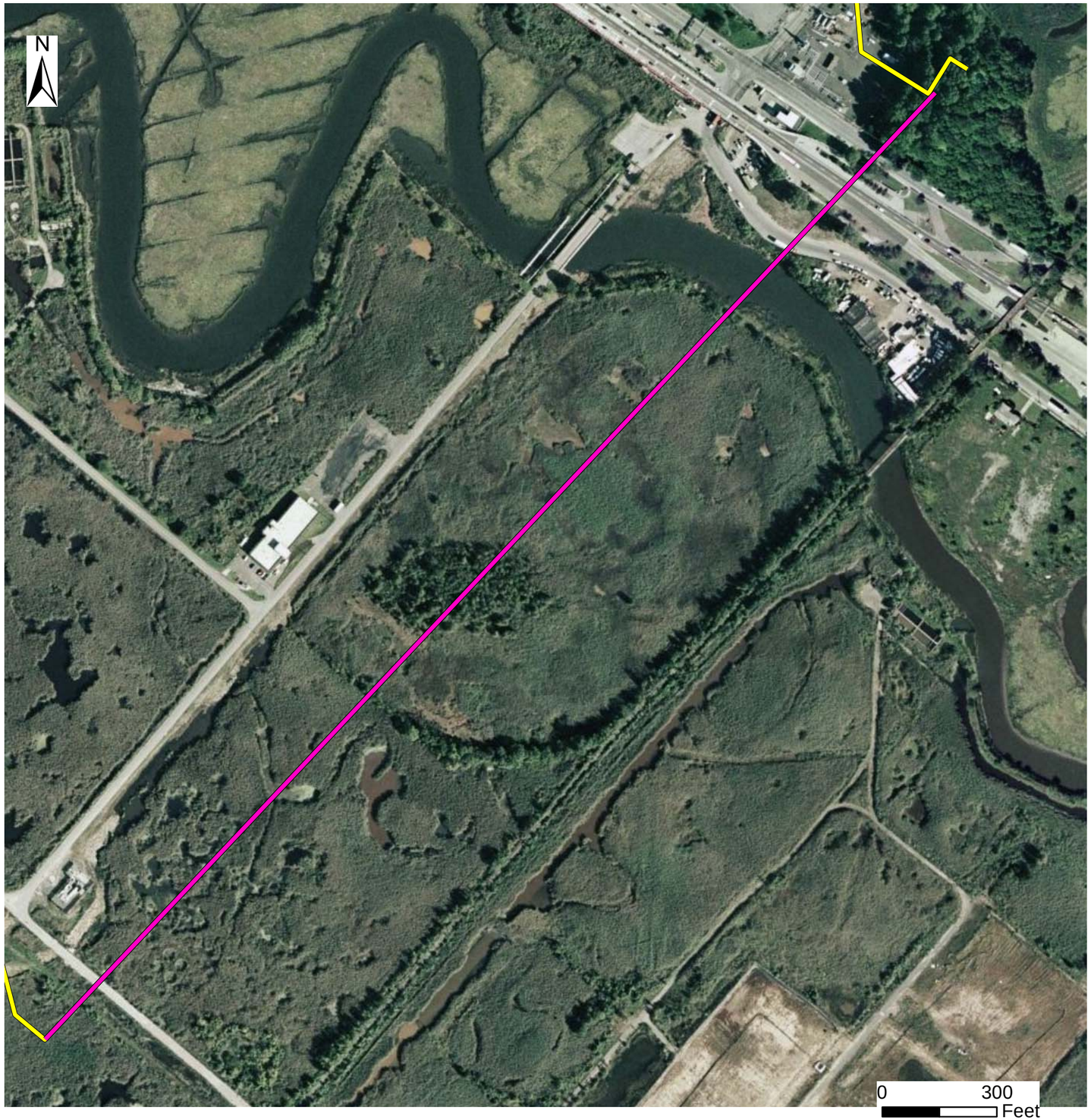
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
LINDEN - STATEN ISLAND, NJ

FIGURE 4

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Linden_Staten Island Map_4.mxd Date: 4/12/2012

Created by: TRC **Date: April 2012**



Legend

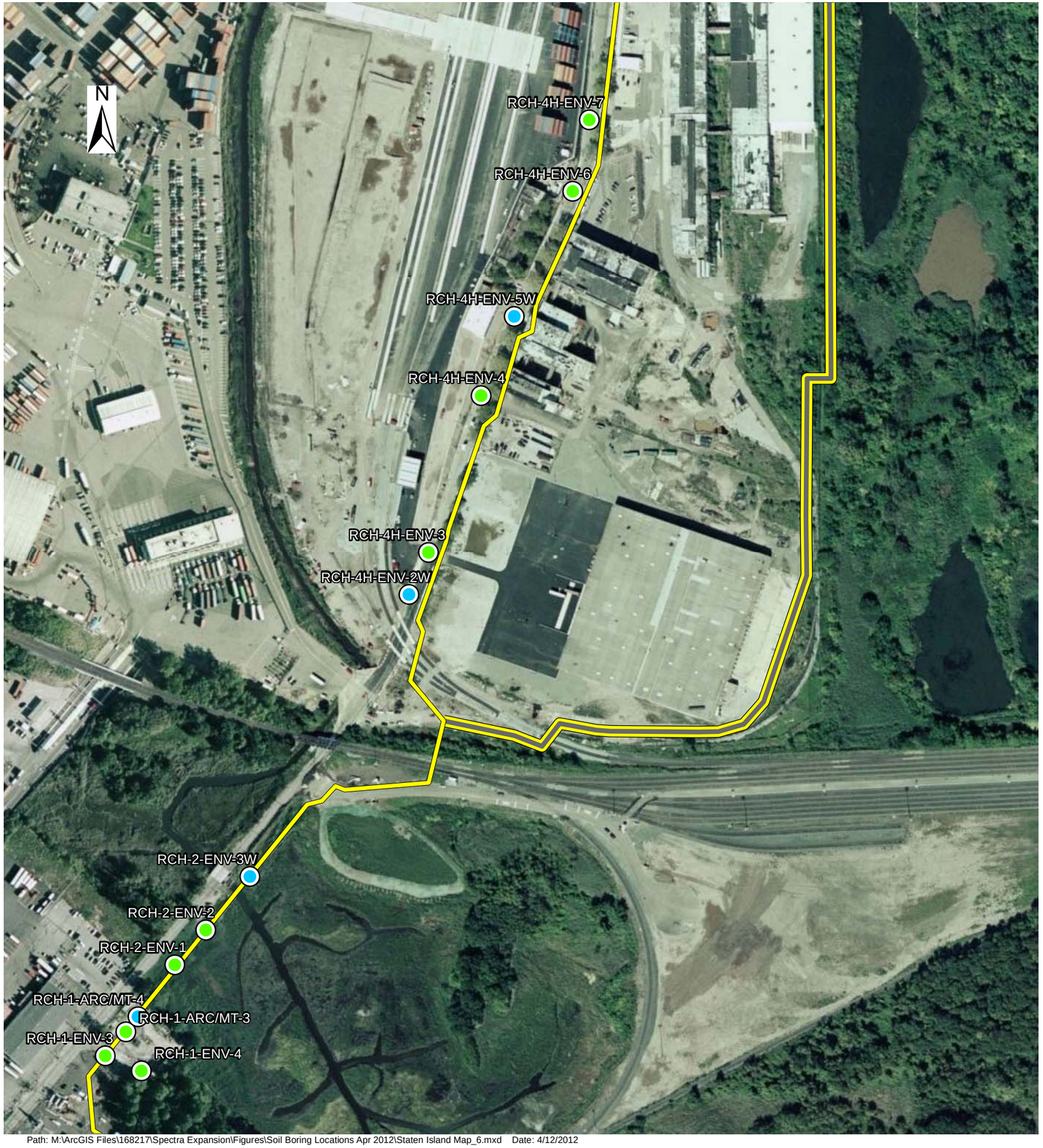
- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
STATEN ISLAND, NJ

FIGURE 5

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Staten Island Map_5.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

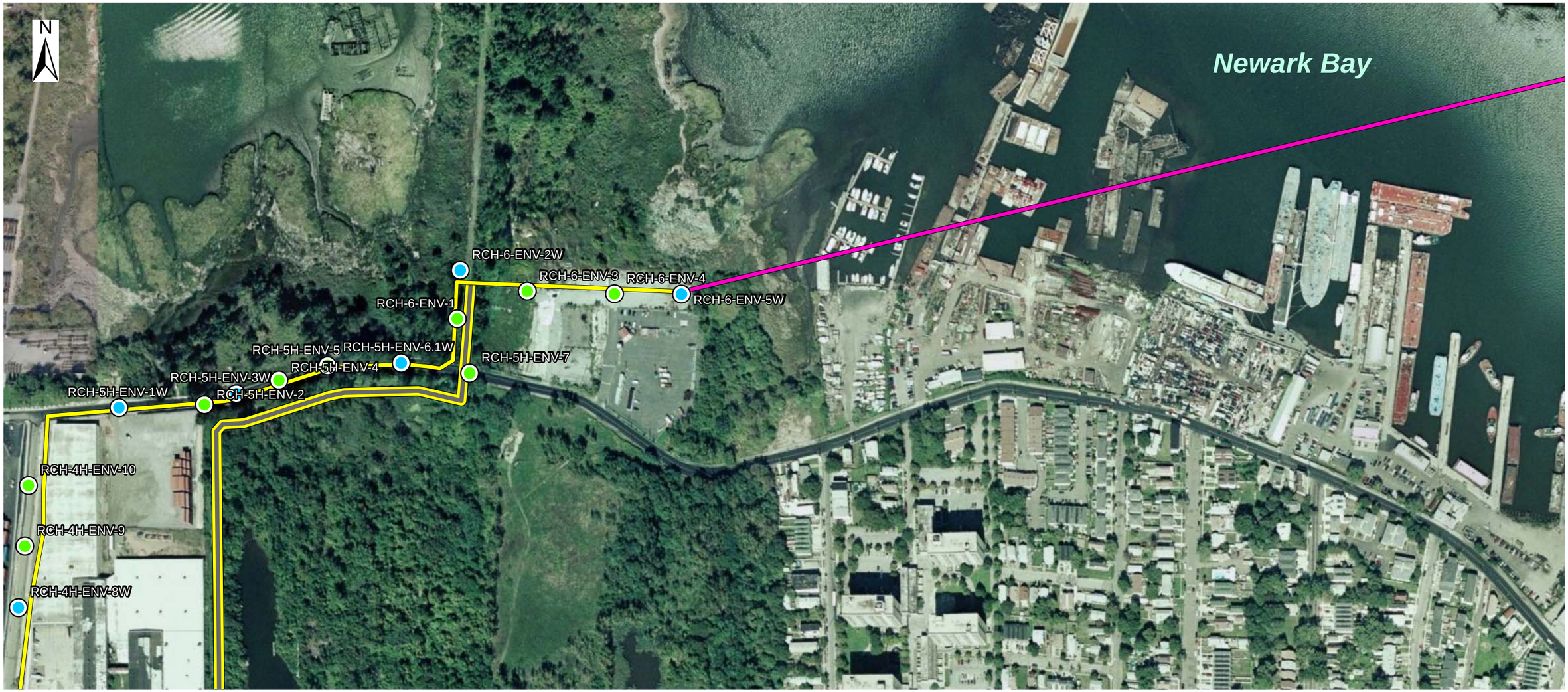
0 300 Feet

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Staten Island Map_6.mxd Date: 4/12/2012

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
STATEN ISLAND, NJ

FIGURE 6

Created by: TRC **Date: April 2012**



0 300 Feet

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
STATEN ISLAND, NJ

FIGURE 7

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Staten Island Map_7.mxd Date: 4/12/2012

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

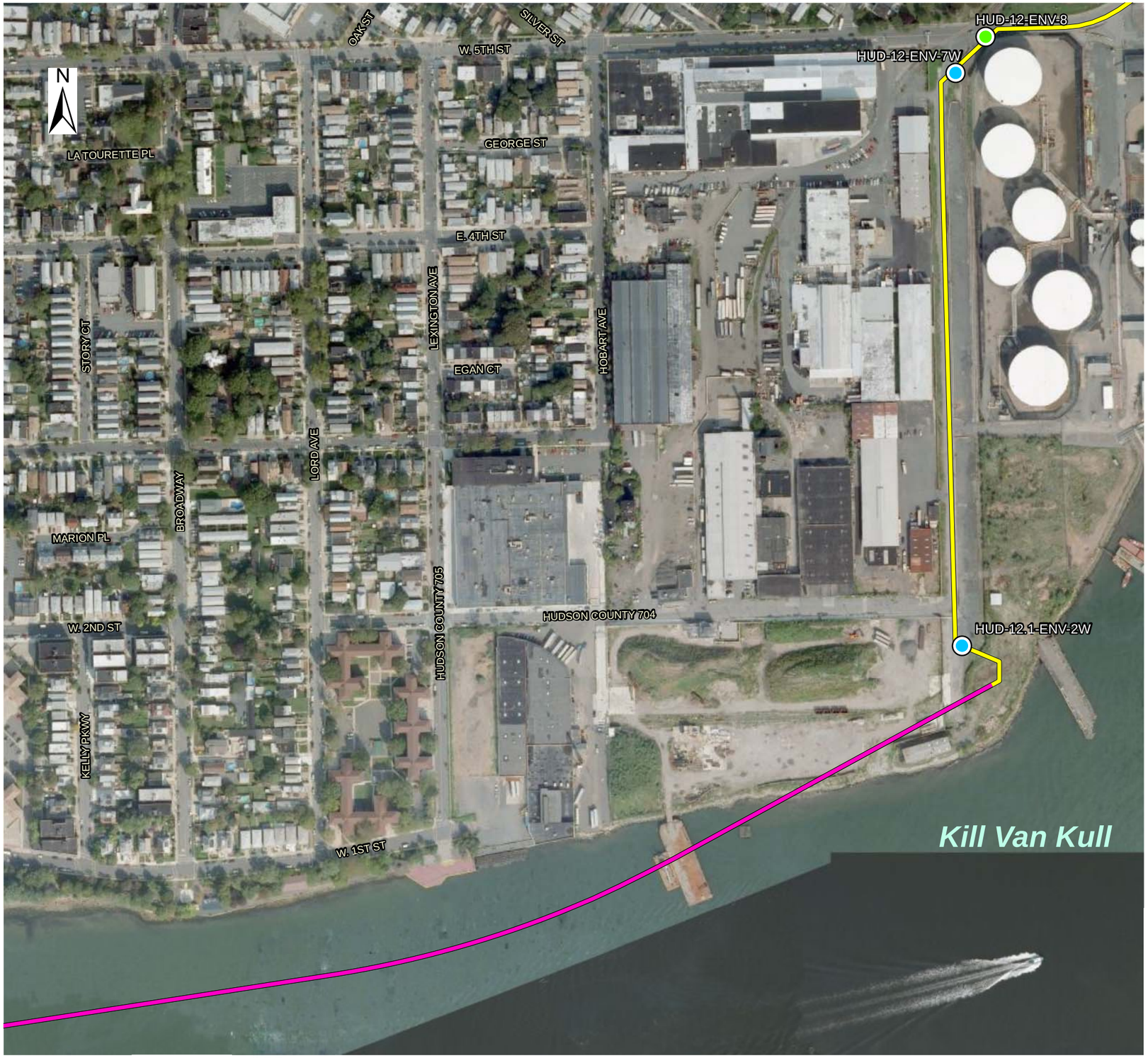
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
BAYONNE, NJ

FIGURE 8

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Bayonne Map_8.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

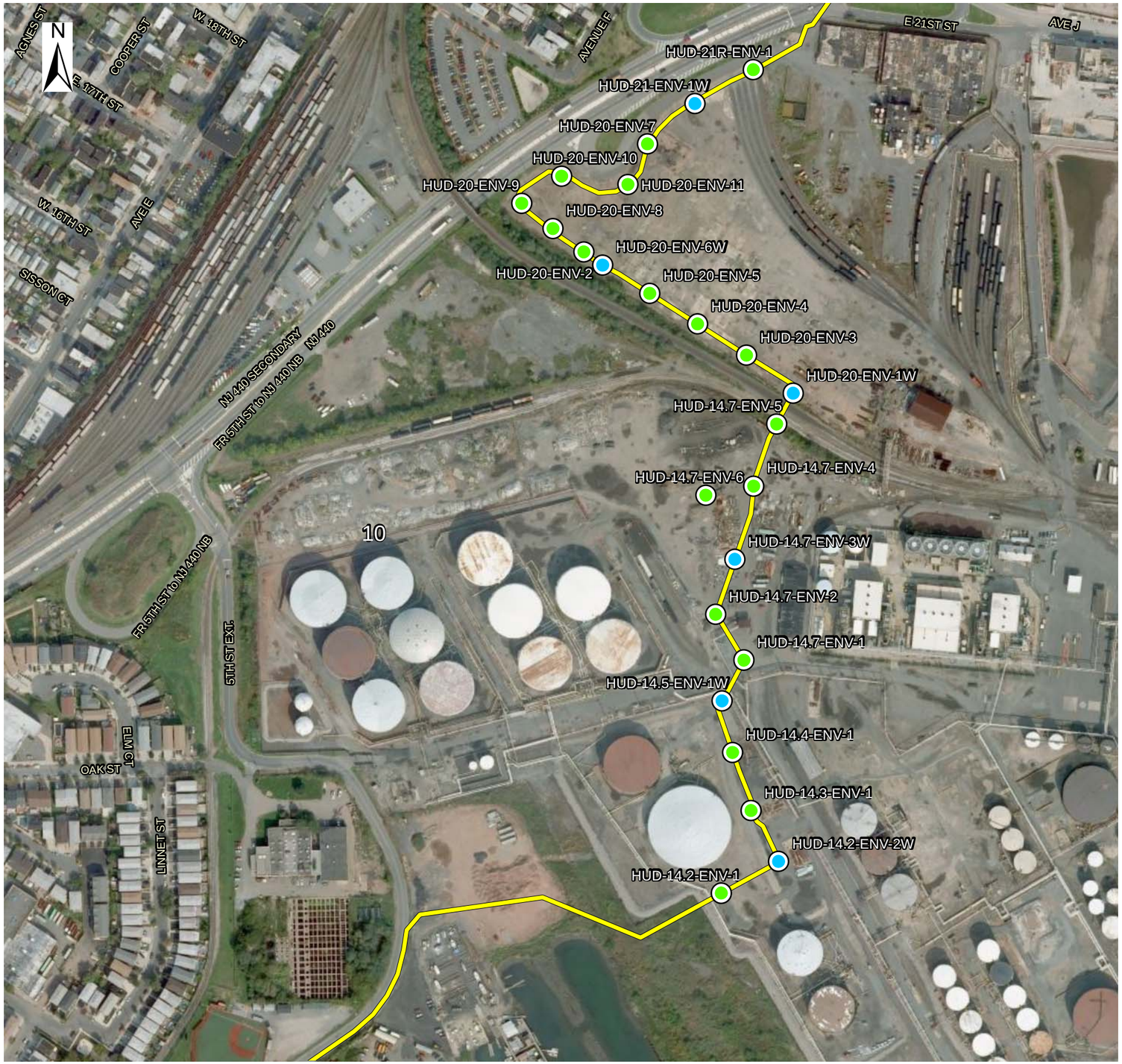
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
BAYONNE, NJ

FIGURE 9

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Bayonne Map_9.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
BAYONNE, NJ

FIGURE 10

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Bayonne Map_10.mxd Date: 4/12/2012

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

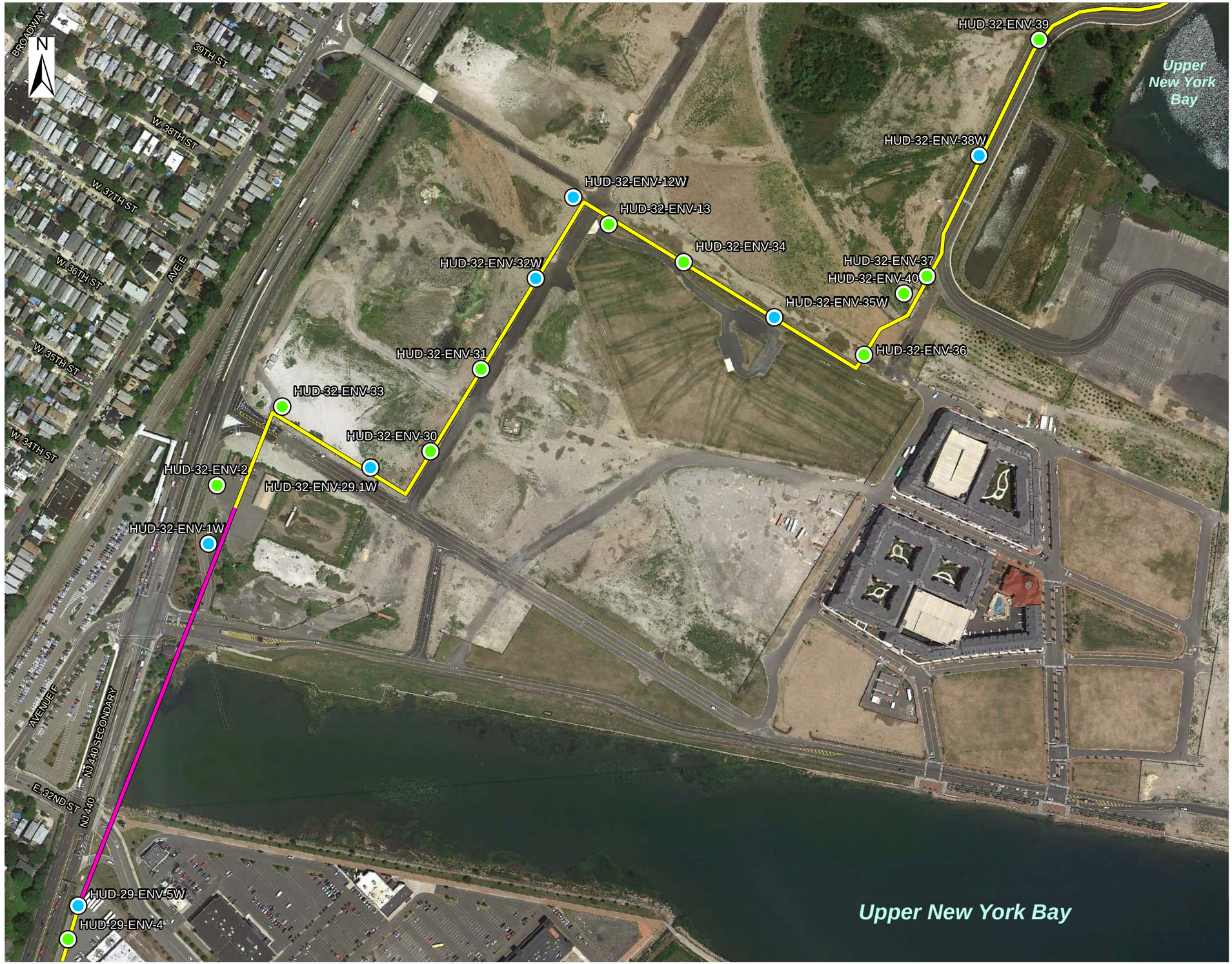
Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
BAYONNE, NJ

FIGURE 11

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Bayonne Map_11.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
BAYONNE, NJ

FIGURE 12

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Bayonne Map_12.mxd Date: 4/12/2012

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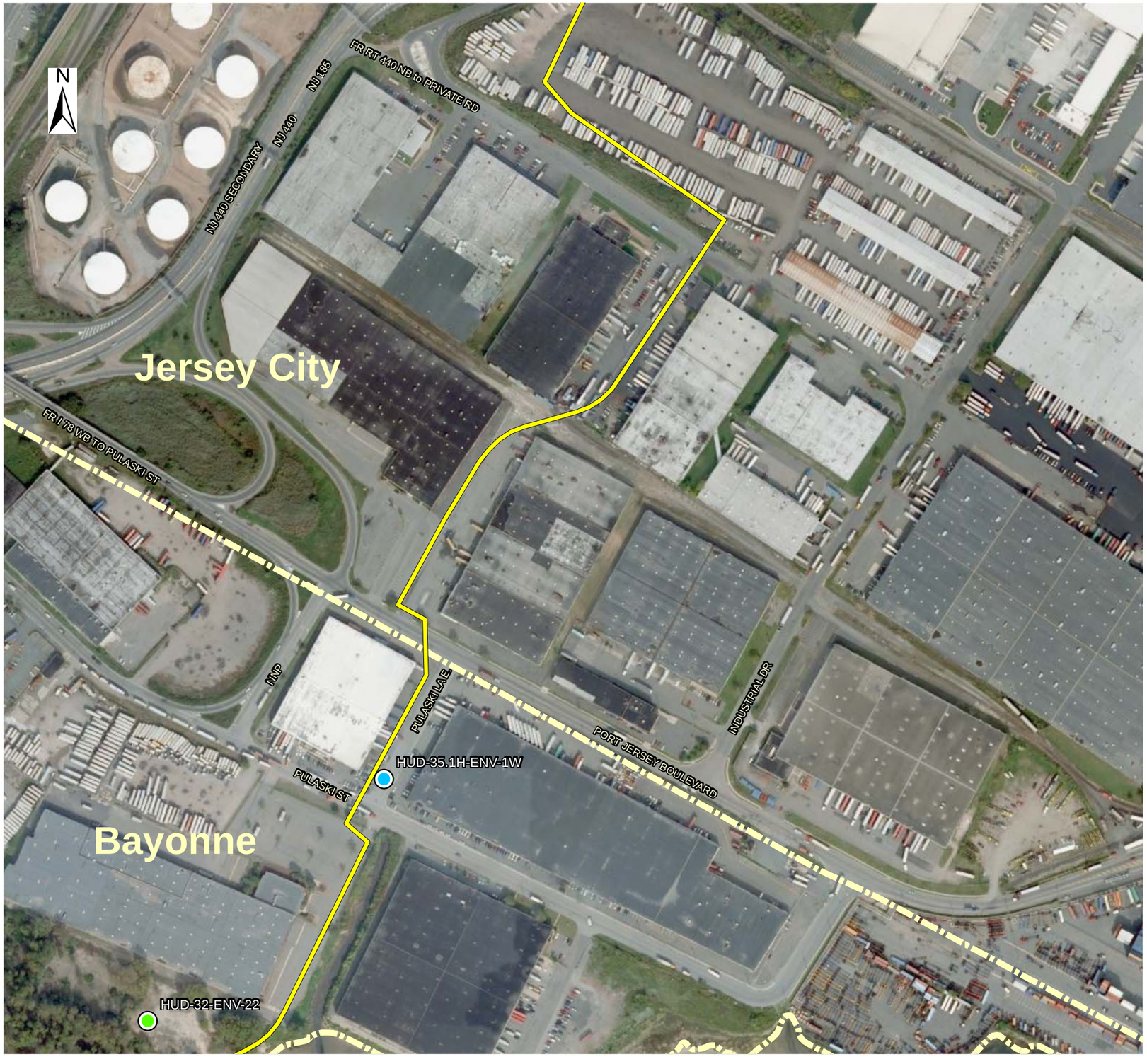


Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

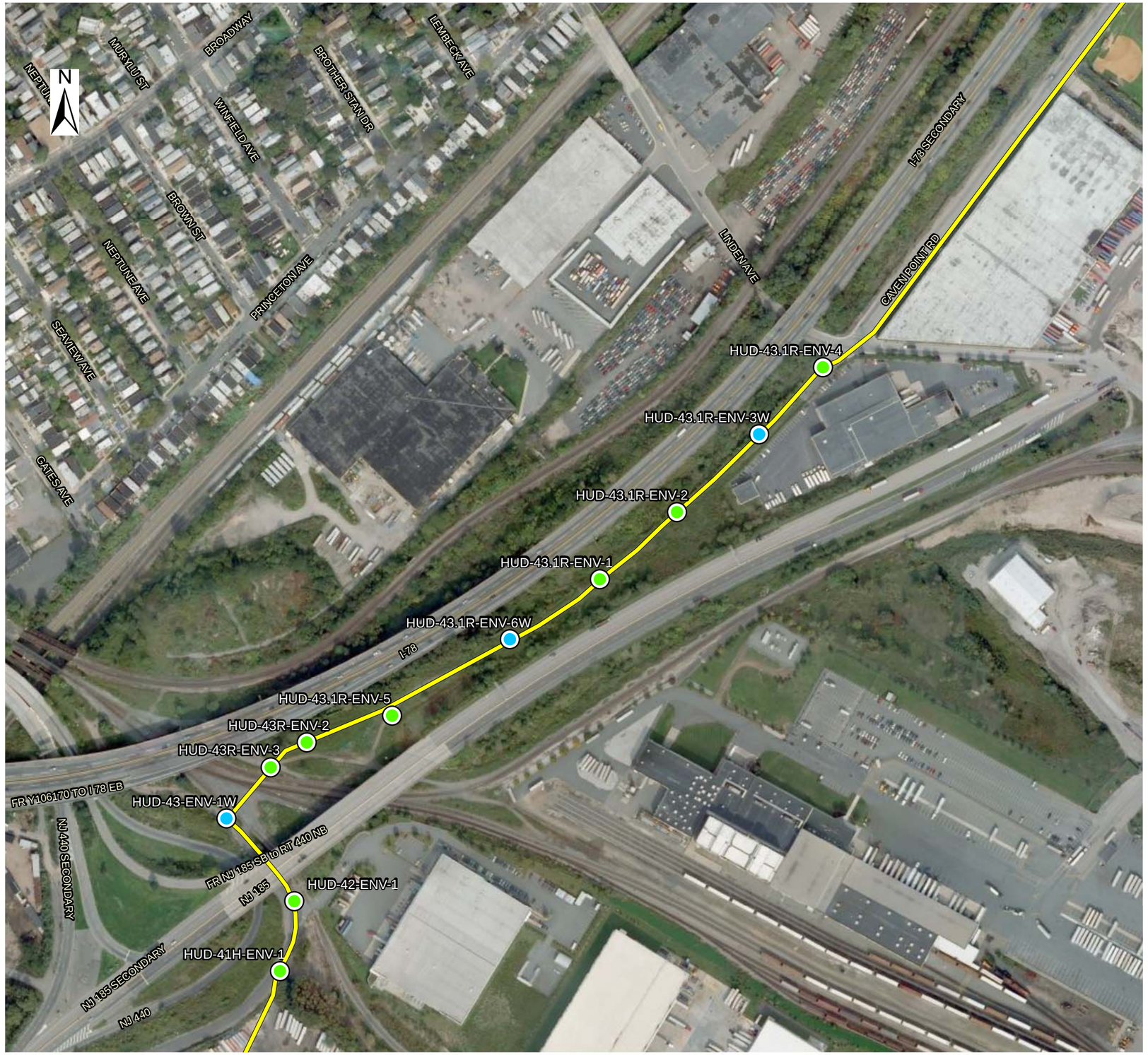
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
BAYONNE - JERSEY CITY, NJ

FIGURE 13

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Bayonne Map Jeresy City_13.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

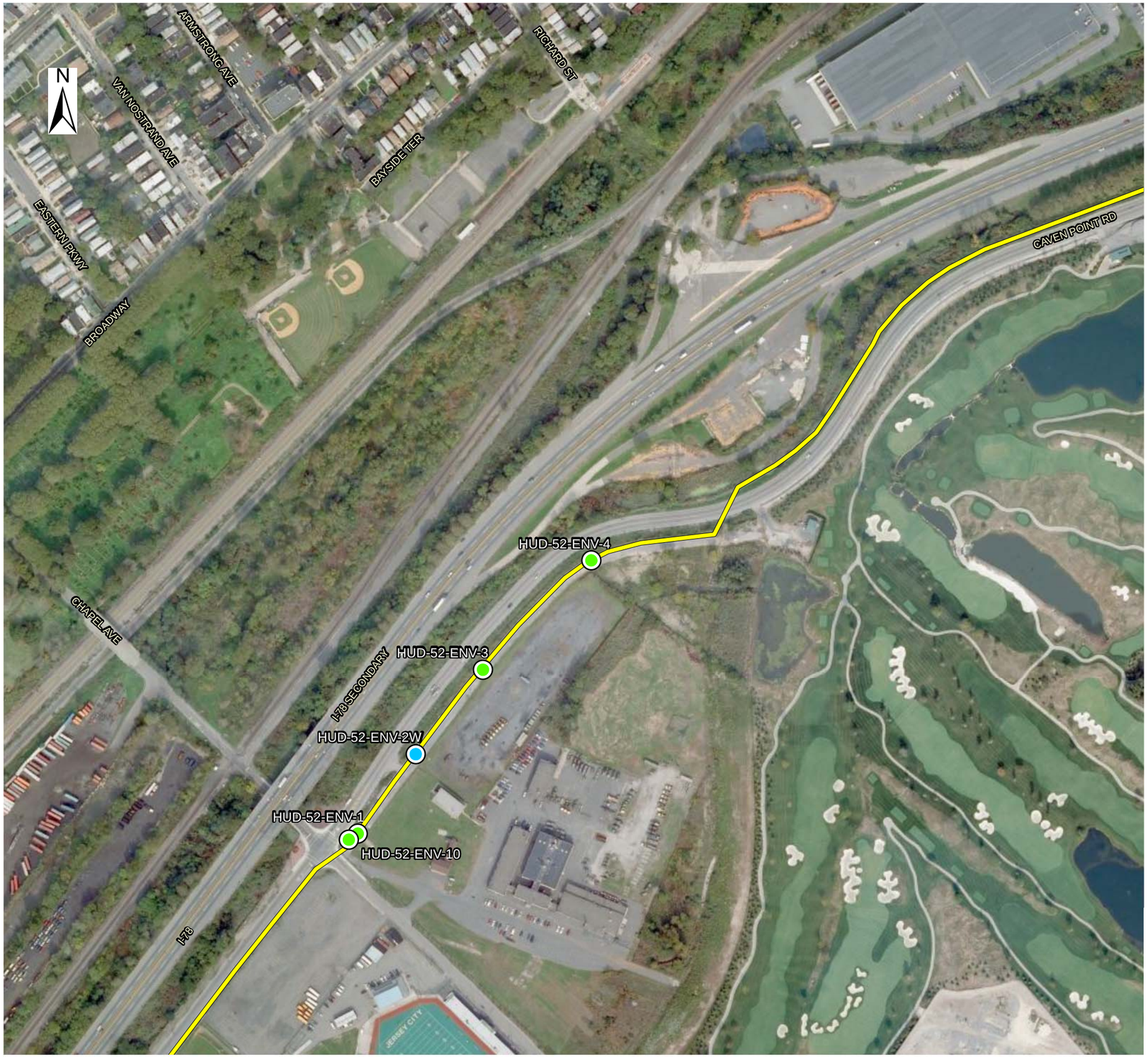
Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 14

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_14.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

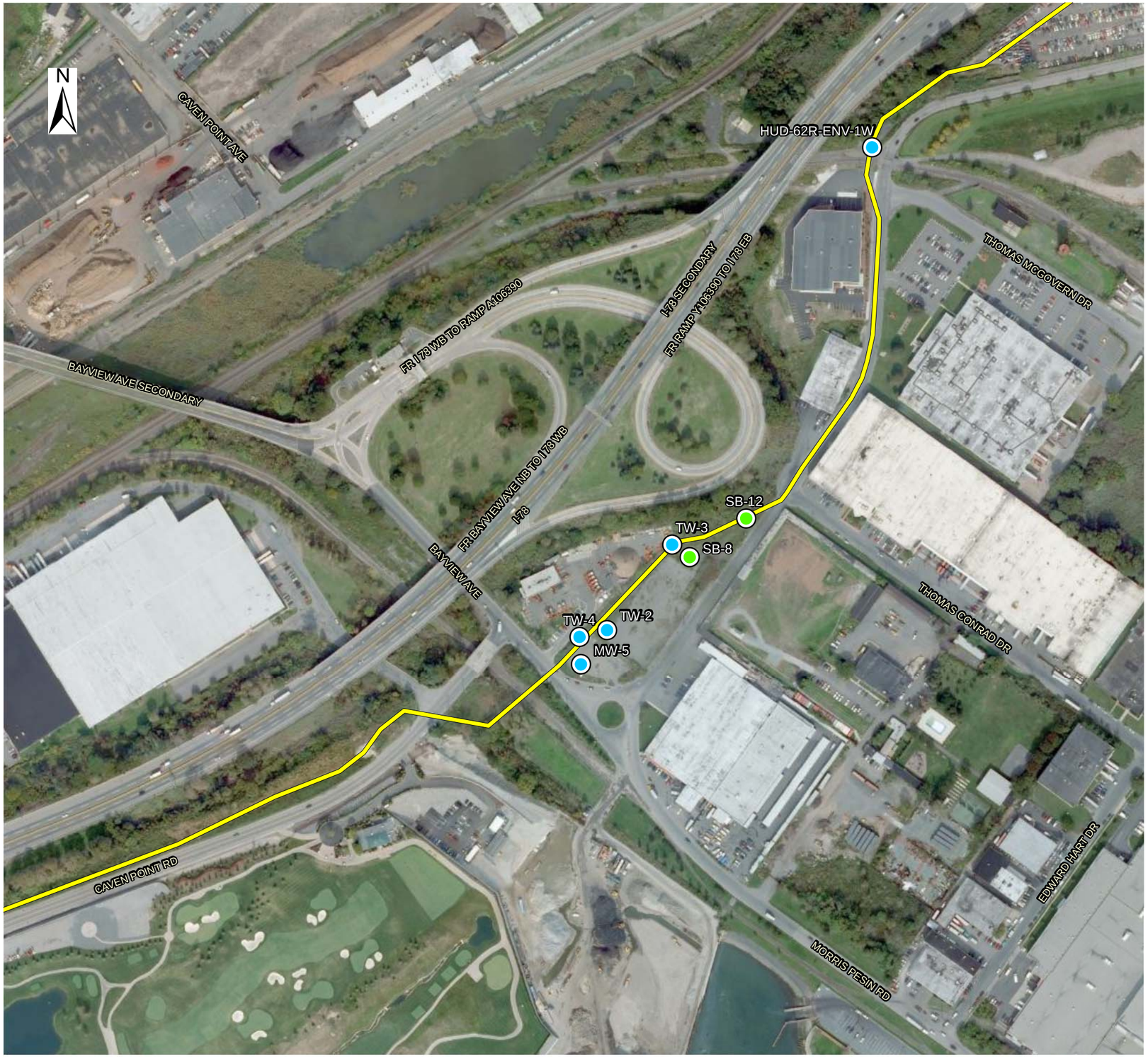
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 15

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_15.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

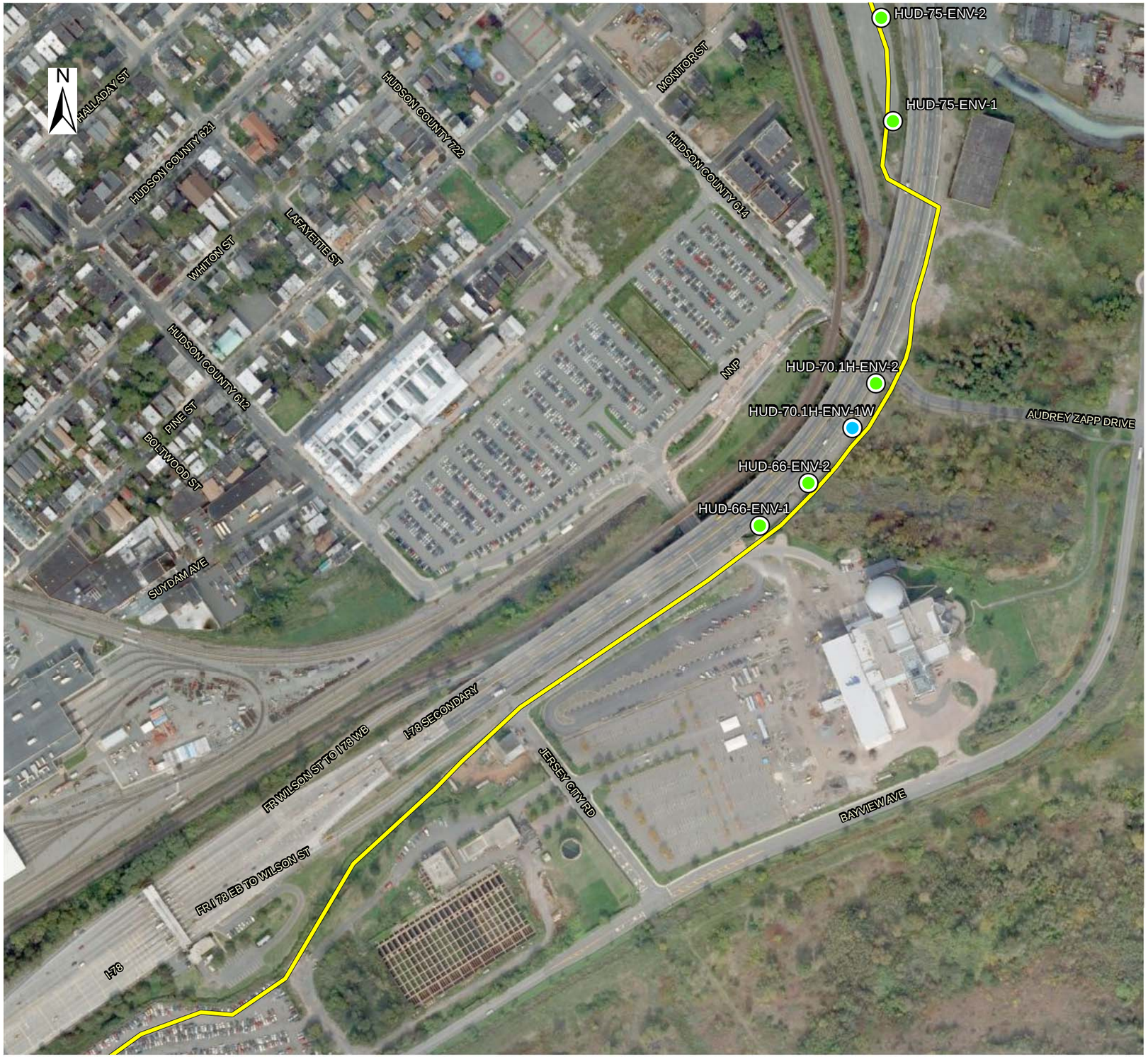
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 16

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_16.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

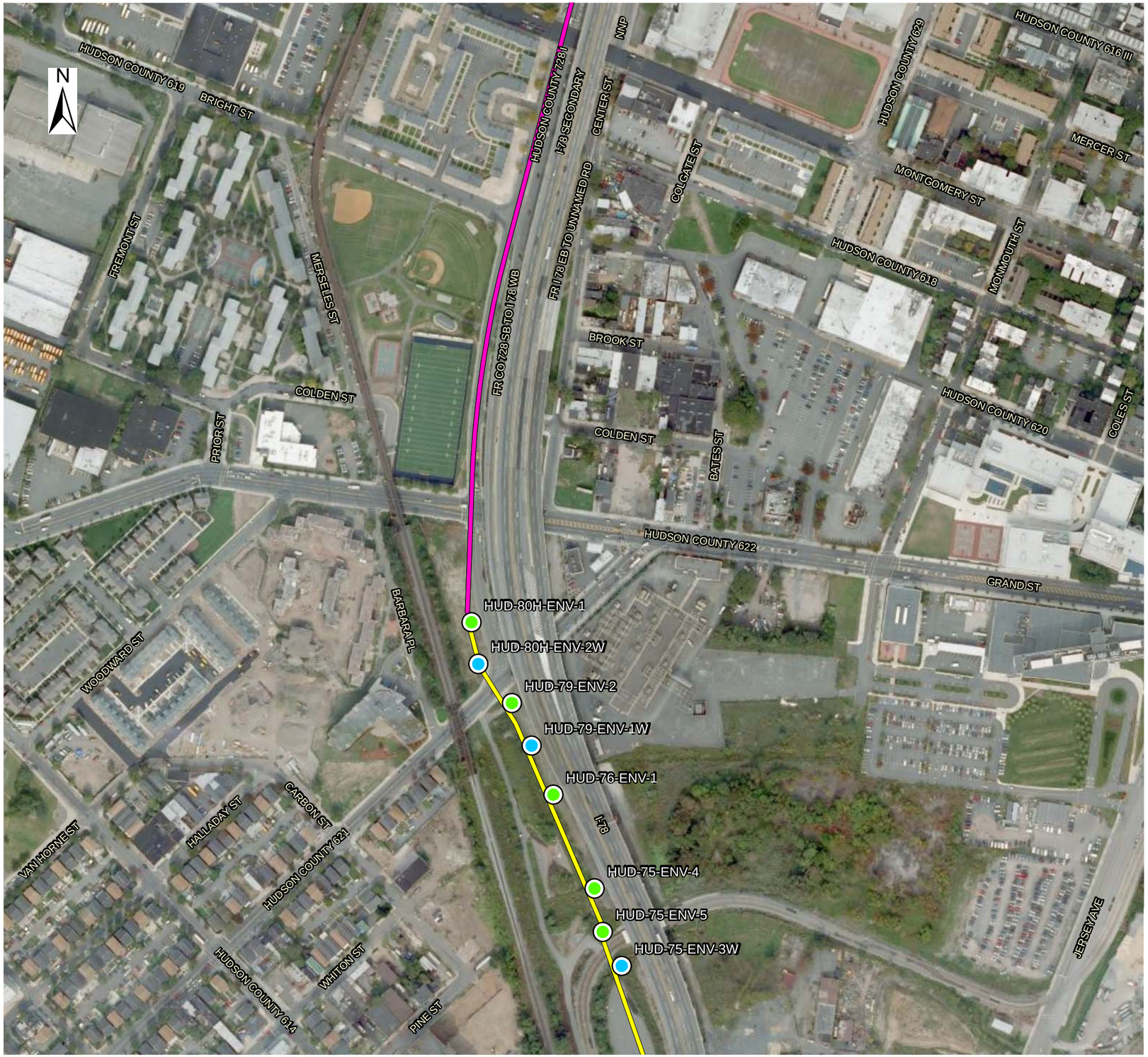
0 300 Feet

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 17

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_17.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 18

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_18.mxd Date: 4/12/2012

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

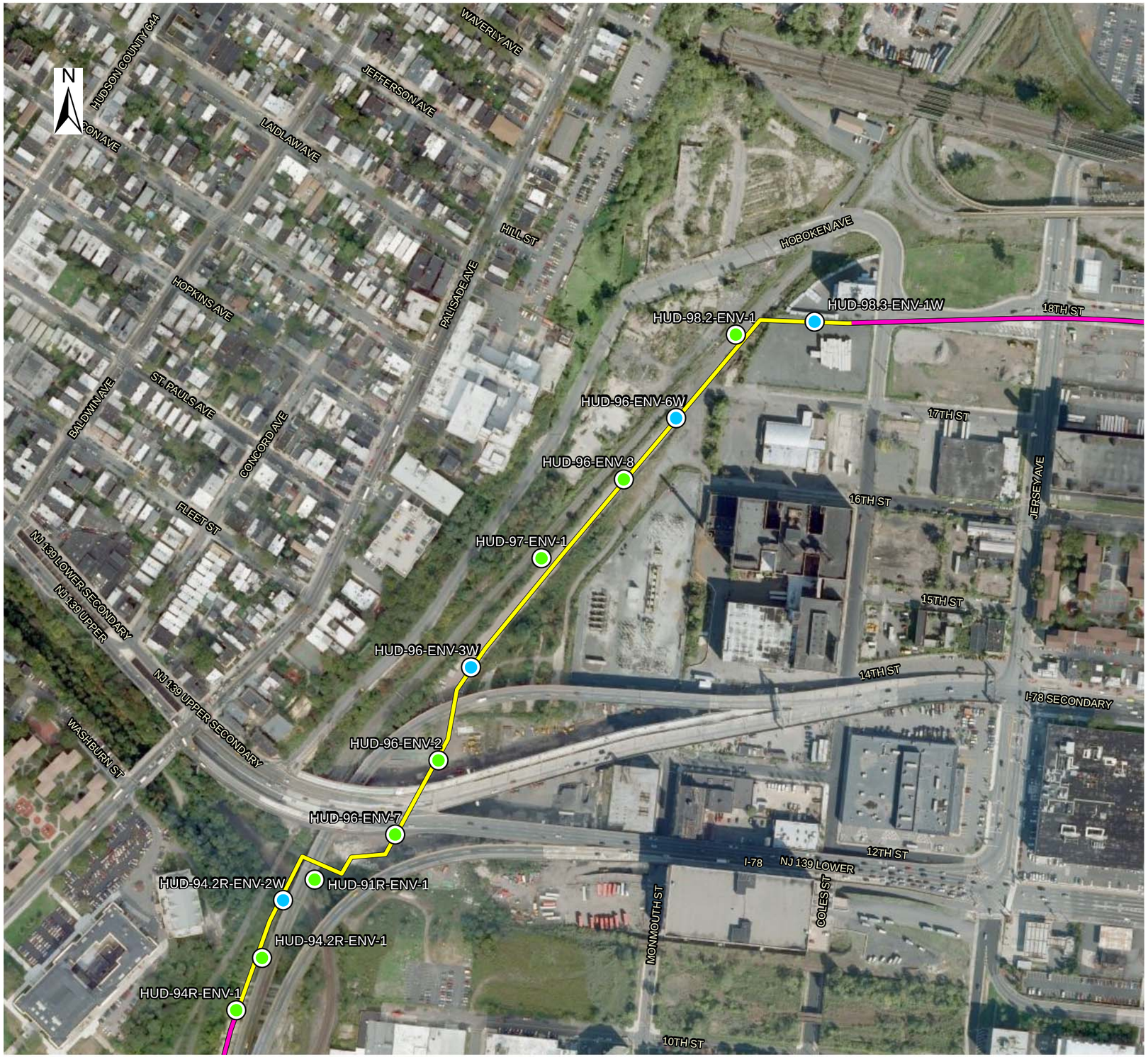
Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 19

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_19.mxd Date: 4/12/2012



Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

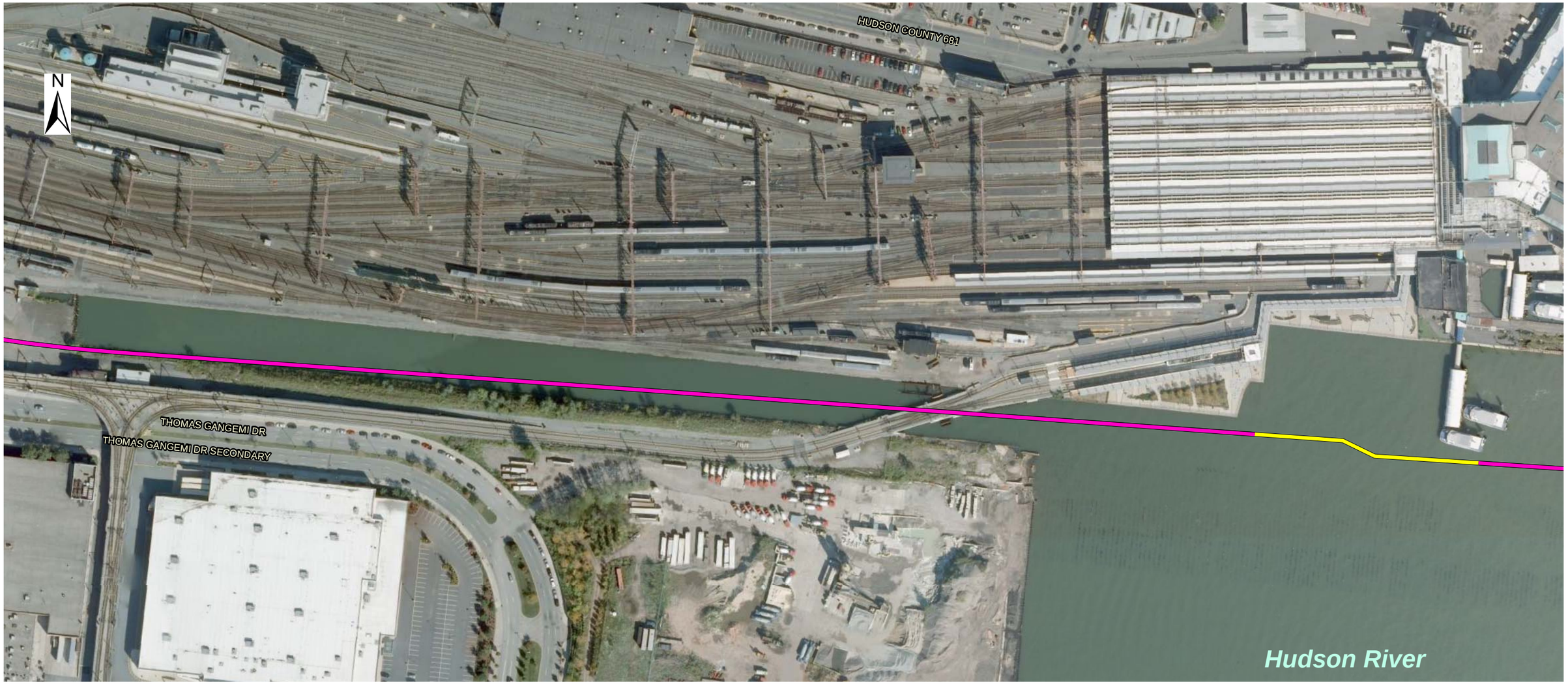
Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 20

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_20.mxd Date: 4/12/2012



0 200 Feet

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
JERSEY CITY, NJ

FIGURE 21

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Jersey City Map_21.mxd Date: 4/12/2012

Legend

- Temporary Well Location
- Soil Boring Location
- Proposed Pipeline
- Horizontal Directional Drill (HDD)

0 300 Feet

Spectra Energy

SPECTRA ENERGY - TEXAS EASTERN TRANSMISSION, LP
SOIL BORING LOCATIONS
MANHATTAN, NJ

FIGURE 22

Created by: TRC **Date: April 2012**

Path: M:\ArcGIS Files\168217\Spectra Expansion\Figures\Soil Boring Locations Apr 2012\Manhattan Map_22.mxd Date: 4/12/2012

APPENDIX E

IMMEDIATE RESPONSE PLAN

IMMEDIATE RESPONSE PLAN ("IRP")

December 2010

Spectra Energy Corp

Immediate Response Plan

Introduction

This Plan describes the Spectra Energy Corp ("Spectra") procedures for dealing with unexpected contamination uncovered during the NJ-NY Expansion Project construction activities.

Company policy requires Spectra personnel and contractors to maintain a safe workplace and protect the environment.

Applicability

Implement this Plan when waste or suspected contamination is uncovered. If a spill occurs and the hazards are known, implement the *Spill Prevention Control and Countermeasure Plan.*

What to Do

All Company personnel, contractors and inspectors must follow these steps if suspected contamination is uncovered:

Step	Action
1	♦ Stop work and leave the contaminated area. ♦ Do not take contaminated clothing or equipment out of the contaminated area.
2	Notify the Spectra Project Director and Project Environmental Manager.
3	♦ The Contractor will ensure that the area is marked or roped off to warn workers to stay clear. ♦ The Contractor will also caution workers to avoid downwind locations if hazardous materials seem to be migrating via air current. ♦ In certain situations, the Spectra Project Director may direct workers to clean and move equipment from the contaminated area. ♦ If on a New York regulated site, appropriate site and NYSDEC personnel will be notified. Locations of potential contaminant sources will be provided in the initial spill report and on the Contaminant Report Form.
4	The Spectra Project Director will make required Company notifications.
5	The Spectra Project Director will inform Company personnel, contractors and inspectors when and how they may safely re-enter the contaminated area based on instructions from: ♦ The Project Environmental Manager; ♦ The Safety Coordinator; and ♦ Construction Management The Spectra Project Director will also provide information on required personal protective equipment and safety precautions.

Continued on next page

Required Company Notifications

This Spectra Project Director must ensure that the following Company contacts are notified immediately when suspected contamination is uncovered.

- The Spectra Spill Response Coordinator, to be determined ("tbd") Office: tbd ; Mobile: tbd; Pager: tbd ;
- The Project Environmental Manager (tbd);
- Safety Coordinator(_____tbd_____); and
- Construction Management (_____tbd_____).

Role of Spill Response Coordinator

When the Spill Response Coordinator receives notification of suspected contamination, they will:

- Make required notifications to the appropriate agencies and property owners, as required;
- Arrange for a hazardous waste contractor to respond and sample the contamination, as necessary;
- Notify the Chief Inspector and Construction Management of sample results;
- Interpret the sample results to determine waste disposal requirements; and
- Coordinate the waste disposal effort.

Role of Safety Administrator

When the Safety Coordinator receives notification of suspected contamination, the Safety Coordinator will:

- Work with Environmental Manager, the Spill Response Coordinator to determine the type of contamination;
- Arrange for a safety contractor to inspect the site, if necessary;
- Obtain Material Safety Data Sheets or other documentation describing worker safety requirements; and
- Communicate safety concerns to the Spectra Project Director and Construction Management and ensure that the Spectra Project Director informs Company personnel, contractors, and inspectors of any hazards and worker safety requirements.

Role of Construction Management

When Construction Management receives notification of suspected contamination, Construction Management will coordinate the activities of all parties to rectify the situation safely and quickly.

Written Report

The Spectra Project Director must ensure that a completed Contamination Report Form is submitted by the Contractor to the Environmental Manager, Spill Response Coordinator, and the Safety Coordinator within 3 working days. The next page is a blank form. In New York, this form will be submitted electronically to the NYSDEC Regional Spills Engineer at rwaustin@gw.dec.ny.us, and will

reference the DEC spill report number that was assigned at initial notification.

CONTAMINATION REPORT FORM

LOCATION	DATE CONTAMINATION DISCOVERED:	DISCOVERED BY:
	PROJECT #:	STATION #:
	CITY/TOWN/STATE:	LANDOWNER:
PERSONNEL INVOLVED	LIST PERSONNEL ON SITE:	
	DESCRIBE ANY INJURIES/EXPOSURE:	
	REPORTED TO: REPRESENTATIVE: DATE/TIME: BY: PROJECT ENVIRONMENTAL MANAGER GAS CONTROL SAFETY DEPARTMENT CONSTRUCTION MANAGEMENT	
TYPE	TYPE: HAZARDOUS SUBSTANCE__ STAINED SOIL__ OIL__ DRUMS__ DEBRIS__ OTHER__	
	DESCRIPTION OF CONTAMINATION (ATTACH SKETCH):	
	DESCRIBE ANY KNOWN HAZARDS:	
INVESTIGATION	WHAT SAMPLES WERE TAKEN? (INDICATE LOCATIONS ON SKETCH)	DATE TAKEN:
	SAMPLE PARAMETERS:	RESULTS:
	FOLLOW UP ACTIONS/REQUIRED PROTECTIVE EQUIPMENT/EMPLOYEES NOTIFIED:	
SIGNATURE	NAME/TITLE:	SIGNATURE/DATE:

APPENDIX F

EQUIPMENT AND VEHICLE DECONTAMINATION MANAGEMENT PLAN

TABLE OF CONTENTS

1.0 INTRODUCTION

Spectra Energy Corp. (Spectra) is proposing to expand its pipeline systems in the New Jersey-New York region to meet the immediate and future demand for natural gas in the largest United States metropolitan area. To accomplish this, Spectra Energy pipeline companies, Texas Eastern Transmission, LP and Algonquin Gas Transmission, LLC (the Applicants) will jointly file an application for Certificates of Public Convenience and Necessity from the Federal Energy Regulatory Commission. Texas Eastern and Algonquin are requesting authorization to construct and operate the New Jersey-New York Expansion Project to expand their existing pipeline systems located in New Jersey, New York, and Connecticut under Section 7(c) of the Natural Gas Act ("NGA"); and to abandon certain facilities under Section 7(b) of the NGA.

The Applicants have conducted extensive research into the condition of soil and groundwater likely to be encountered along the NJ-NY Expansion pipeline route and reviewed files for over 250 sites in the cities of Linden, Bayonne and Jersey City, New Jersey and in the boroughs of Staten Island and Manhattan, New York. Based on this file review, Texas Eastern has created a comprehensive database, including graphical representations of critical environmental parameters.

A large portion of the NJ-NY Expansion pipeline route, especially in the cities of Bayonne and Jersey City and parts of Staten Island, will cross areas of "historic fill", which is a heterogeneous mixture that can contain reworked soil, construction debris, brick, glass, wood, coal, coal ash, coal cinders, industrial residues (such as metal slag), and other anthropogenic debris. The Applicants expect that much of the soil generated during excavation and pipeline installation will be slightly contaminated, particularly with the metals and polycyclic aromatic hydrocarbons that are contained in coal, coal waste, and other fill materials. Other types of contamination could include petroleum contamination of soil and groundwater near former and existing refining and storage facilities, and metal slag used for fill.

The purpose of this Equipment and Vehicle Decontamination Plan is to inform the contractor of required measures to decontaminate equipment and vehicles of excavated material prior to leaving the pipeline construction corridor or travelling from one work area to another within the corridor. The contractor will furnish, operate and maintain equipment for dry brushing and for power washing construction equipment to remove material on the excavator buckets, tires, tracks, undercarriage and other parts of vehicle exteriors and equipment. Decontamination of equipment and vehicles is necessary to eliminate the spread of contaminants into the nearby public roads and other properties as a result of soil excavation, backfilling and handling activities. This Equipment and Vehicle Decontamination Plan describes control measures to be implemented before equipment and vehicles are allowed to leave the work site. The plan requires equipment and vehicles to be either dry scrubbed or power washed with steam or high-pressure water. The wastewater and sediment generated by the washing procedure will be contained, collected, tested and removed from the site and properly disposed of in accordance with federal, state and local regulations. Heavy equipment may be dry scrubbed, if possible, depending on the degree of contamination, moisture content and whether or not free product is present.

This Equipment and Vehicle Decontamination Plan does not address personnel protective equipment and decontamination of personnel which are to be addressed in the contractor's Health and Safety Plan.

2.0 APPLICABILITY

The Equipment and Vehicle Decontamination Plan is applicable for equipment and vehicles prior to leaving the pipeline construction corridor or movement within the construction corridor from one work site or property to another.

3.0 RESPONSIBILITY

The contractor will provide a copy of the Equipment and Vehicle Decontamination Plan to all applicable site subcontractors. The Construction Manager will be responsible for implementing the Equipment and Vehicle Decontamination Plan and ensure adherence to the plan.

4.0 DECONTAMINATION REQUIREMENTS AND PROCEDURES

All equipment and vehicles will arrive at the work site free of contamination. The contractor will make provisions for decontamination of equipment and vehicles within the pipeline construction corridor. The excavated soils and material will be removed from equipment and the exterior of vehicles prior to exiting the pipeline construction corridor and moving within the corridor between work sites or properties. Vehicles and equipment will be washed with steam or high pressure water. The contractor will furnish a source of clean potable water to be used for decontamination. The wastewater and sediment will be contained, collected, tested, removed from the site and properly disposed of in accordance with federal, state and local regulations. Heavy equipment may be dry scrubbed, if possible, depending on the degree of contamination, moisture content of the soil and whether or not free product is present. Equipment and vehicles will be inspected prior to leaving the site by the contractor to ensure that proper decontamination has been performed.

The minimum requirements for the decontamination pad include:

- The decontamination pad will be constructed with a bermed perimeter and a minimum 60-mil thick high density polyethylene liner ("HDPE").
- The liner will be constructed to drain to one corner and into a watertight sump for wastewater containment and recovery.
- Wastewater will be pumped into containers for storage and disposal.
- The contractor will maintain a stone cover and a sand layer to assure that the decontamination pad HDPE liner is not damaged.
- The decontamination pad will be constructed of adequate size to provide for proper decontamination of the largest excavation equipment used by the contractor, without release of wash water to the ground surface.
- Once construction at the work site has been completed, the decon pad will be disassembled and each component handled properly.

Physical removal without the use of water (dry scrubbing):

- Soils can be removed by physical means involving dislodgment from heavy equipment when the soil is relatively dry and does not contain free product.
- Physical removal will be performed on the decontamination pad described above.
- Use long-handled wire brushes, rods, and shovels for dislodging soil caught in tires, buckets, and undersides of vehicles and heavy equipment.
- Containerize soil removed from vehicles and heavy equipment.
- In some cases, a combination of physical removal of soil followed by a steam or high-pressure water wash to remove residual soils may be appropriate.

Equipment and Vehicle Decontamination Inspection:

- The effectiveness of any decontamination method should be assessed at the beginning of the project and periodically throughout the lifetime of the project.
- If contaminated materials are not being removed, the decontamination program must be revised.
- Visual inspection for discolorations, stains, and visible soil will be performed to assess the effectiveness of the decontamination procedure.

This Equipment and Vehicle Decontamination Plan should be revised whenever the site contaminates and hazards change based on new information.

APPENDIX G

DUST AND ODOR CONTROL PLAN

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this Dust and Odor Control Plan is to inform the contractor and its subcontractors of required measures to reduce the impact of dust and odors on the nearby community (i.e., off-site receptors, including residences and businesses) and on-site workers as a result of construction and soil handling activities. This plan describes control measures to be implemented before, after, and while conducting any dust and odor generating operation. The plan requires monitoring, corrective actions to abate emission of dust and odors, and the maintenance of daily logs documenting implemented monitoring and control measures.

2.0 APPLICABILITY

The plan is applicable to any routine dust or odor generating activities during construction such as routine use of unpaved roads, soil excavation, and handling of any other dusty or odorous materials. The requirements are in addition to personnel monitoring and personnel protective equipment ("PPE") requirements pursuant to the Occupational Safety and Health Administration ("OSHA") and the site-specific Health and Safety Plan ("HASP").

3.0 RESPONSIBILITY

The contractor will furnish, operate and maintain equipment, and employ methods to prevent migration of dust and odors beyond the boundaries of the work site. The contractor will provide a copy of the Dust and Odor Control Plan to all applicable site subcontractors. The Construction Manager will be responsible for implementing the Dust and Odor Control Plan, and maintaining the daily log of implemented control measures.

4.0 DUST EMISSIONS AND CONTROL MEASURES

The contractor will implement measures to reduce dust generation and employ practices to prevent excessive fugitive dust emissions (e.g., visible dust clouds). No dust control measures are generally required during precipitation events. Dust control measures are required especially during warm dry weather and those days with strong winds. A source of clean, potable water must be made available to wet down exposed soil surfaces. Dust control measures include but are not limited to:

Soil excavation and handling

- Load haul trucks such that the load is below the freeboard;
- Prevent spillage;
- Apply water when needed prior to disturbance and during disturbance to prevent dust generation;
- Maintain existing ground coverings (e.g., existing pavement) until disturbance is required for construction and stabilize exposed soil with gravel or other stabilizing material, if dust generation is observed;
- Discontinue construction activities if generation of dust is observed until dust control is applied.

Unpaved haul and access roads

- Apply water when needed;
- Control track-out;
- Cover loads;
- Maintain appropriate low vehicle speeds in unpaved areas;
- Rout vehicles and equipment to covered surfaces (e.g., paved or graveled) when possible;
- Prevent motor vehicle use when unnecessary in unpaved areas;
- Remove soil from the exteriors of vehicles and construction equipment prior to moving off work sites.

5.0 ODORS AND CONTROL MEASURES

Construction activities will be performed so as to limit the potential for adverse impacts due to fugitive odors. Potential receptors for fugitive odors include the general public and commercial and residential properties. Odor suppression measures (odor suppression foam) will be used during construction activities as necessary. This includes odor suppression measures for transport vehicles by spraying odor suppression foam on the loaded materials, lining the transport vehicles to prevent leakages, and covering the loaded vehicles as required to control odors.

The need for odor control will be determined based on the detection of nuisance odors at the boundary of the work site or if odor complaints are received. If adverse impacts due to fugitive odors occur, one or more of the following procedures will be implemented:

- Apply odor suppressant (Biosolve™ or Rusmar Foam™) over open excavation areas and/or stockpiled material;
- Trucks, rolloffs and other containers used to transport soil and waste materials will be prepared to prevent odor impacts to off-site communities. Transport vehicle preparation with regard to odor control will consist of spraying odor suppression foam on the loaded materials when necessary and covering loaded vehicles with functional tarps or plastic sheeting;
- If the above control measures are not effective, encapsulation of the construction area, and air exhaust and treatment may be required. Encapsulation could include temporary tent structures with venting, and air exhaust and treatment (only would be considered if odors are causing impacts and complaints from adjacent residents and businesses are received).

6.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

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

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

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

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

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

7.0 RECORDKEEPING AND MONITORING

The EMP Inspector will keep a daily written log recording the actual application or implementation of the control measures delineated in the Dust and Odor Control Plan.

The EMP Inspector will monitor odors at the downwind boundary of the work site. If odors are detected at the boundary of the work site or if odor complaints are received, then the contractor should implement control measures and the EMP Inspector will monitor for odors in the surrounding community as well.

Continuous monitoring for particulates will be required for all ground intrusive activities and during soil handling activities which include soil excavation, soil loading, soil moving, and soil stockpiling. The EMP Inspector will monitor particulate concentrations at the perimeter of the work area at temporary particulate monitoring stations. Based on the nature of known or potential contaminants in soil, action levels for particulate levels at the perimeter of the work area will be established. In general, work may continue with dust suppression techniques provided that downwind particulate levels do not exceed 150 micrograms per cubic meter (ug/m^3) above background (upwind location). This action level is not meant to satisfy the requirements of personnel monitoring and PPE pursuant to OSHA and the site-specific HASP. Other action levels may be applicable for worker protection depending on the specific contaminant encountered and the PPE worn. In addition to monitoring equipment, fugitive dust migration will be visually assessed during work activities.

The particulate monitoring will be performed using real-time monitoring equipment. The particulate monitoring equipment will be capable of measuring dust particulates that are less than 10 microns in size or respirable dust. The monitoring equipment will be equipped with an audible alarm to indicate exceedance of the action level. The air monitoring equipment will be inspected at least once every 30 minutes and measurements will be recorded manually on a daily log form by the EMP Inspector. At the end of each work day, the EMP Inspector will download the particulate data and review and compare the data to action levels to verify proper controls were in place throughout the work day. Each calibration event, any equipment malfunctions, unusual conditions, air monitoring station locations, and any exceedances of action levels and countermeasures implemented will be recorded n the log form. The EMP Inspector will maintain at the site one spare particulate meter in fully operational condition, available for immediate service.

8.0 COMMUNITY AIR MONITORING PROGRAM

A Community Air Monitoring Plan (CAMP) will be implemented at known regulated contaminated sites in New York. A CAMP requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at regulated contaminated sites in New York. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities.
The CAMP will comply with the requirements identified in DER-10, Appendix 1A.

APPENDIX G.1

COMMUNITY AIR MONITORING PROGRAM

Community Air Monitoring Plan

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.
3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.