



## NJ TRANSIT TransitGrid Project

### Pre-Construction Investigation Work Plan (PCIWP)

***Prepared by:***

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## 1.0 INTRODUCTION

### 1.1 Project Overview

On behalf of the New Jersey Transit Corporation (NJ TRANSIT), BEM Systems, Inc. (BEM) has prepared this Pre-Construction Investigation Work Plan (PCIWP) for the proposed NJ TransitGrid Project. The proposed Project will include a natural gas fired electric power generating plant (referred to as the Main Facility) and electrical lines and substations to distribute power. In order to construct the proposed Project, NJ TRANSIT is proposing to acquire approximately 26 acres of the Former Koppers Seaboard Site (Koppers Site or Site), which is a known contaminated site. The purpose of this PCIWP is to identify the current site conditions to develop appropriate health and safety protocols for the Health and Safety Plan (HASP) and appropriate remedial actions for the proposed development for the Remedial Action Workplan Addendum (RAWPA). This will be completed by conducting multi-media sampling to identify current contaminant levels and a tracer dye test to determine if groundwater is bypassing the current remedial actions and discharging to the Hackensack River.

This investigation will be conducted in general accordance with the New Jersey Department of Environmental Protection (NJDEP) Licensed Site Remediation Professional (LSRP) program regulations under the Site Remediation Reform Act (SRRA, New Jersey Statutes Annotated [N.J.S.A.] 58:10C) enacted on 7 May 2009. The Koppers Site is currently listed under NJDEP Program Interest (PI) Number G000001985 and was enrolled into the LSRP program under Mr. John T. Bolan (LSRP License Number: 577508) of Paulus Sokolowski and Sartor, LLC (PS&S) on May 1, 2012. The proposed investigation will also be conducted in general accordance with the NJDEP's Technical Requirements for Site Remediation (TRSR), New Jersey Administrative Code (N.J.A.C.) 7:26E, amended in May 2012, the Administrative Requirements for the Remediation of Contaminated Sites (ARRCS) 7:26C, and other applicable NJDEP guidance documents. The proposed investigation field activities will be conducted in accordance with an access agreement executed between Hudson County Improvements Authority (HCIA) and NJ TRANSIT, NJDEP's Field Sampling Procedure Manual (FSPM) (August 2005), BEM's Health and Safety Plan (HASP) and BEM's Quality Assurance Project Plan (QAPP).

### 1.2 Objectives

The objective of this PCIWP is to obtain data on the current site conditions to develop appropriate health and safety protocols for the HASP and appropriate remedial actions for the proposed development for the RAWPA. It will also provide NJ TRANSIT with baseline conditions to document the current environmental site conditions prior to acquisition. A detailed list of the objectives and the scope of work (SOW) of this PCIWP are:

- Establish baseline conditions of groundwater contamination by conducting one round of groundwater sampling of the five monitoring wells located within the acquisition areas;
- Evaluate the presence/ depths of Processed Dredge Material (PDM) by conducting six soil borings above the historic fill layer within the acquisition areas. Soil samples will be collected from each boring to evaluate if soil contamination exceeding the NJDEP Soil Remediation Standards (SRS) is present;
- Evaluate the integrity of the slurry wall and steel sheet pile (SSP) wall by conducting a tracer dye test; and

- Evaluate potential vapor intrusion issues by collecting three soil gas samples biased to the proposed building locations.

### **1.3 Project Area and Site Location Description**

The Koppers Site is undeveloped vacant land located in the Town of Kearny, Hudson County, New Jersey. The property consists of Block 287 Lots 54, 55, 56, 60, 61B, 61C, 62, 62R, 70, 70R, 71, 71R, 73, and 80 for a total of approximately 174 acres, of which approximately 126 acres are landward, 42 acres are riparian land, and 6 acres are located on a southern outparcel. NJ TRANSIT is planning to acquire a 20+/- acre landward parcel in the central “neck” portion of the Koppers Site and the 6-acre outparcel located south of the Morris and Essex (M&E) line (**Figure 2**). In this report, the term “subject property” or “property” or “Site” is used to represent the entire Koppers Site. The terms “property parcels” or “NJ TRANSIT's property parcel areas” typically represent the portion or portions of the subject property that may be acquired by NJ TRANSIT.

### **1.4 Site History**

The Koppers Site was previously utilized as a coke manufacturing and coal tar refining plant from approximately 1917 to 1979. Based on previous investigations, former Site activities affected the soil, sediment, and shallow groundwater throughout the property. The Eastern Area and portions of the Central Area contain organic compounds and metals with pockets of coal tar DNAPL. The Western Area and portions of the Eastern Area contain Chromium Ore Processing Residues (COPR) used as fill material. The Western Area also contains chlorinated DNAPL and chromium from the adjacent Standard Chlorine Chemical Company, Inc. (SCCC) Property, which has been listed as a National Priorities List (Superfund) Site. The SCC Site and the areas of the Koppers Site impacted the contaminants from the SCCC Site fall under the jurisdiction of the United States Environmental Protection Agency (USEPA). In 2010, NJ TRANSIT conducted an extensive investigation at the Site to characterize the conditions at the site prior to the implementation of the remedial actions. The investigation included characterizing the extent of soil, groundwater, and DNAPL contamination at the site.

### **1.5 Regulatory Status**

Environmental investigations have been conducted at the Koppers Site since the 1980s. Prior to the LSRP program, the Site was being remediated under NJDEP oversight in accordance with a 1986 Administrative Consent Order (ACO) and a 1997 Memorandum of Understanding. Currently, the property is owned by the HCIA, who is responsible for the final capping of the Site, but Beazer East, Inc. (Beazer), the former property owner, remains the responsible party for remediation. The Koppers Site is under a NJDEP Remedial Action Regulatory Timeframe to complete the remedial action by May 7, 2019. All remedial action activities are being conducted under NJDEP approved Remedial Action Work Plans (RAWPs). A Public Participation Plan was approved by NJDEP on March 31, 2017 and revised on March 8, 2018.

## 2.0 PHYSICAL SETTING

### 2.1 Land Use and Development

The property is currently owned by the HCIA and is undeveloped land in an otherwise industrially developed area. The only structures on-site are on the eastern portion of the Site and include the Great Lakes Dredge and Dock Company (GLDD), PSE&G lattice transmission towers, and the DNAPL Recovery system. The surrounding area consists of the Hackensack River and associated wetlands to the north and east, the SCCC property to the west, and the M&E commuter rail lines to the south. The small 6-acre outparcel is located to the south of the M&E Line, and is bounded by Fish House Road, the Owens Corning property, and the Belezza Construction Company. There are no residential areas or community facilities in the vicinity of the Site. According to the Koppers Coke Peninsula Redevelopment Plan (New Jersey Meadowlands Commission (NJMC), 2013), the Site is zoned Intermodal B and falls under the jurisdiction of the NJMC (now the New Jersey Sports and Exposition Authority).

### 2.2 Drainage and Topography

The existing remedial actions/ engineering controls on-site have greatly affected the drainage and topography. In accordance with the RAWPA (Key Environmental, Inc. (Key), 2013), the elevation on-site has been increased up to 20 to 30 feet (ft) with graded Processed Dredge Material (PDM) to create a generally flat surface. This low permeability PDM cap diverts storm water into four on-site drainage structures that discharge to the Hackensack River. Based on the NJ TRANSIT Koppers Koke Partial Site and Outparcel Acquisitions drawing prepared by Naik Group dated October 10, 2016, Site elevation ranges from approximately 5 to 30 ft above mean seal level (msl), with the drainage basins and access roads at the lowest elevations. As part of the remedial actions, slurry walls and steel sheet pile (SSP) walls have been installed along the river and Western Areas to reduce or prevent contaminated groundwater and DNAPL from entering the waterways. These walls have impacted the direction of groundwater flow on-site.

### 2.3 Geology

#### 2.3.1 Regional Bedrock Geology

According to the United States Geological Survey map of northern New Jersey, the project area lies within the Lowland section of the Piedmont Physiographic Province of New Jersey. This location is within the Hackensack River Basin, and is part of the Newark Group, which formed during the late Triassic Period.

#### 2.3.2 Surficial Geology

Based on the Remedial Investigation Report (RIR) (BEM, 2010), seven general overburden units have been identified at the acquisition areas as described below.

- **PDM** consisting of fine silts and organic sediments from harbor dredging or other operations mixed with processed materials (ash or cement). PDM has been spread over the Historic Fill across the majority of the property. This unit ranges in thickness from 20 to 30 ft.
- **Historic Fill** – Fill consisting of coarse to fine sand with varying proportions of gravel, clay, silt, organics, wood, glass, industrial plant process materials (slag, cinders, coke, coal, etc.) and brick. This unit ranges in thickness from 4 to 21 ft.

- **Meadow Mat** – These former marsh deposits comprise organic soils that include peat and organic silt and clay. The peat (commonly referred to as “Meadow Mat”) generally contains a greater percentage of fibrous vegetation. This unit is approximately 3 to 6 ft thick. The Meadow Mat is continuous across the property but is absent or very thin towards the southwest corner of the Site and Eastern Area.
- **Clayey Silt Loams** –An alluvial layer (clayey silty loams) is present in place of the Meadow Mat in the eastern area up to 45 ft thick. In general, the amount of organic materials decreases with depth while the amount of sand increases with depth.
- **Sand and Silts** – Beneath the peat and/or clayey silt layer is a fine to medium-grained sand unit with variable amounts of silt. This layer is thinner to the east and thickens to 20 ft in the center of the Site. In general, sand is more prevalent to the west and silt is more prevalent to the east.
- **Varved Clay** – A layer of soft to very soft varved clay exists throughout the entire property beneath the fill and brown marsh deposit soils. The thickness of the entire stratum ranges from 40 to 65 ft thick along the western barrier wall; 30 to 53 ft thick along the eastern barrier wall; and 23 to 53 ft thick along the southern boundary.
- **Glacial Till** – A continuous stratum of glacial till underlies the property ranging from 5 to 26 ft thick. It mainly consists of varying amounts of gravel, sand, clay and occasional cobbles and boulders. The glacial till is typically dense to very dense.

## 2.4 Hydrogeology

There are four groundwater zones identified on-site including three overburden water bearing units (historic fill, sand/silt unit, and till layer) and the bedrock aquifer. Groundwater is present in the historic fill and under semi-confined conditions in the sand and silt unit. The Meadow Mat separates the historic fill and sand/silt unit throughout most of the Site but does not eliminate a hydraulic connection. Additionally, the Historic Fill and sand/silt units are in direct contact where the Meadow Mat is absent in the southwestern portion of the project area. Based on previous reporting (Roy F. Weston, 1993 and others) shallow groundwater fluctuation does occur from tidal influences. The glacial till deep overburden water bearing zone is separated from the upper zones by the thick and continuous varved clay and silt unit. Groundwater flow in bedrock is primarily through fractures in the Brunswick Formation (USEPA Region II Aquifer Reports). Based on the RIR (BEM, 2010), local mounding occurs at eastern/central portions of the project area, while other flow is discharged at the Site periphery (river edge), especially to the north-northwest along the western portion of the Site. The groundwater in the sand unit below the Meadow Mat flows toward the south, which follows the migration of the Hackensack River and has a minimal hydraulic gradient. The Meadow Mat and the varved clay act as confining units, isolating the shallow groundwater system, and limiting the vertical movement of groundwater.

## 2.5 Surface Water Bodies and Wetlands

The Hackensack River is located along the northern and eastern boundary of the site. The river is classified by NJDEP as “SE2” and the designated uses are maintenance, migration, and propagation of the natural and established biota, migration of diadromous fish, maintenance of wildlife, and secondary contact recreation. No wetlands are mapped on the National Wetlands Inventory Maps for New Jersey. BEM wetland scientists have field verified 0.26 acres of wetlands along the southern boundary of the 6-acre outparcel. Approximately 0.82 acres of potential wetlands along the northern boundary are pending field verification outside the 20-acre parcel.

### 3.0 AREAS OF CONCERN

In March 1986, NJDEP required remediation to be initiated and an ACO was executed between NJDEP and Beazer, formerly known as Koppers Company, Inc. Based on the Case Inventory Document included with the latest RAWPA (PS&S, 2014), there are 12 AOCs associated with the Site. Only six of these AOCs are associated with the proposed acquisition areas including AOC-1: Unconsolidated Fill Zone (Shallow) Groundwater, AOC-3: Site Wide Surface Soils; AOC-7: Sediments; AOC-8: Western Area Waste Piles, AOC-11: Central Area Waste Piles and AOC-12: Glacial Till. A map of the AOCs is included as **Figure 3** and a map of the well network located within the acquisition area is included as **Figure 4**.

#### 3.1 AOC-1: Unconsolidated Fill Zone (Shallow) Groundwater

Based on the RAWP (Key, 1998), shallow groundwater contamination of benzene, polycyclic aromatic hydrocarbons (PAHs), total and dissolved arsenic, total and dissolved manganese, total mercury, total and free cyanide, chlorobenzene, 1,4 dichlorobenzene, total and dissolved chromium, and total thallium is present in the Eastern, Central, and Western Areas of the Koppers Site. In the 1990's, a DNAPL Recovery System was constructed in the northeastern portion of the Site. The system is currently still in operation but the site LSRP, Mr. John Bolan, has proposed to discontinue and remove the system due to limited recovery. An indeterminate timeframe groundwater classification exception area (CEA) for site-wide shallow groundwater was issued in 2011 and includes benzene, chlorobenzene, methylene chloride, total xylenes, 1,4-dichlorobenzene, 2,4-dimethylphenol, benzo(b)fluoranthene, hexachlorobenzene, indeno(1,2,3-cd)pyrene, aluminum, arsenic, chromium, iron, lead, manganese, nickel, and sodium.

Five monitoring wells are located on the NJ TRANSIT acquisition area with, monitoring wells MW-110R, MW-119R, MW-122, and MW-123R on the 20-acre parcel and MW-113 on the 6-acre outparcel. Based on the information provided as part of the acquisition process, sampling results from December 2015 for the four monitoring wells on the 20-acre parcel were obtained. The results indicated that MW-110R exceeded the NJDEP Groundwater Quality Standard (GWQS) for benzene, MW-110R, MW-122, and MW-123 exceeded for arsenic, and all four wells exceeded for iron, manganese, and sodium. It is to be noted that sampling is ongoing and has been conducted since at the site in 2016, 2017, and 2018.

#### 3.2 AOC-3: Site Wide Surface Soils

According to the 1984 Memorandum written by NJDEP, cinders produced from the gasification plant and coke producing facility on-site were used as fill material in unknown locations at the Koppers Site. According to the Draft RIR (Keystone, 1987), this fill material was found in the majority of the Site ranging from 4 to 21 ft thick and consisted of varying amounts of silt, sand, gravel, pitch, cinders, slag, coal and coke fragments, brick and concrete rubble. The fill was also used to construct a dike along most of the Hackensack River shoreline to the north of the Site. According to the RIR (BEM, 2010), soil samples collected from the fill indicated the presence of site-wide contaminants of concern (COCs) including PAHs and metals, mostly below the 2008 Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS).

The Site is separated into four sections: the Eastern Area, the Central Area, the Western Area, and the Southern Area. The NJ TRANSIT Acquisition area encompasses portions of the Central, Western, and Southern Areas. According to the RIR (Keystone, 1988), the Central Area of the Site contained petroleum hydrocarbons, total base neutrals, PAHs, arsenic, lead and total cyanide



exceeding the NJDEP soil cleanup criteria (SCC). According to the RAWP (Key, 1998), remediation was conducted in 1989 to remove all debris and Waste Piles (AOC-11) and a gravel/surface cover was placed in the area. The Western Area contained PAHs and total cyanide exceeding the NJDEP SCC and waste piles in this area were consolidated and capped. An investigation of the southern property boundary indicated that PAHs, arsenic, and hexavalent chromium exceeded the NRDCSRS. According to the 2010 RAWPA, PDM has been placed as a subgrade to the final proposed cover. Within the NJT proposed acquisition areas, the final grade is approximately 32 feet above mean sea level (msl). As of the most recent information obtained, the final cover installed consists of a layer of geotextile membrane over the PDM, which is topped with six inches of clean stone.

### **3.3 AOC-7: Sediments**

In the 1980s, coal tar material seeped onto the banks of the Hackensack River creating a sheen on the water and impacting the sediment on the riverbank. To reduce the amount of sheen, a slurry wall and SSP wall was installed along the riverbank. Sediment sampling along the riverbank indicated several semi-volatile organic compounds (SVOCs) and arsenic exceeded the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC). From June 2008 to September 2009, a total of approximately 30,000 cubic yards of shoreline sediment and dike materials were removed and consolidated on-site. The excavation areas were lined with woven geotextile fabric with areas where there was potential for residual contamination also lined with CETCO™ mats and Aqua Blok™ materials. The areas were backfilled and a wave-dampening barrier of two parallel rows of A-jacks were installed.

### **3.4 AOC-8: Western Area Waste Piles/ AOC-11: Central Area Waste Piles**

According to the Preliminary Assessment (Keystone, 1986), surface waste piles, believed to be oxide box wastes, were observed in the Western and Central Areas. Sampling of the piles indicated high levels of total cyanide and sulfate and a soil pH below 4. The RIR (Keystone, 1988) stated that there were three oxide box waste piles and three “organic” waste piles on-site that originated from the former coke oven and gas conditioning/ processing plant. Sampling indicated that one of the oxide box waste piles contained chromium exceeding the Resource Conservation and Recovery Act (RCRA) EPA Toxic test limits and that the “organic” waste piles contained high levels of total base neutrals. Based on the Waste Pile Inventory Report (Keystone, 1989), a total of 33 waste piles were identified in the Central Area consisting of 6,096 cubic yards of bulky and industrial waste. According to the Construction Documentation Report and Engineers/ Operators Certification (Key, 1990), the 33 waste piles and 4 additional waste piles consisting of a total of 5,000 cubic yards of industrial, bulky, and hazardous wastes were removed from Site. The waste pile area within the NJ TRANSIT proposed acquisition area has been capped with PDM. As a final cover, HCIA has placed a six inches of clean stone underlain by a geotextile membrane over the NJ TRANSIT proposed acquisition area including the area of where waste piles were capped with PDM.

### **3.5 AOC-12: Glacial Till**

The RAWP (Key, 1998) indicated that six glacial till monitoring wells contained total iron, total and dissolved manganese, total and dissolved sodium, and total aluminum were found in exceedance of the GWQS. Seven additional wells were installed and the results indicated that the Central Area exceeded the GWQS for benzo(a)pyrene and arsenic and the Western Area had no

exceedances. According to the RIR (BEM, 2010), the source of the contamination in the glacial till aquifer is believed to be from the historic fill. According to the Fourth Quarter 2015 Groundwater Monitoring and Progress Report (FTS, 2016), the glacial till aquifer groundwater is being sampled semi-annually to monitor the metal contamination. The Report indicates these exceedances are attributed to background or naturally occurring constituents; thus, no further investigation is recommended at this time.

## 4.0 PROPOSED INVESTIGATION PLAN

Based on a review of the available documents for the site, six AOCs are present within the proposed acquisition areas. The proposed investigation will include collecting samples of groundwater, soil, surface water, sediment, and soil gas. A tracer dye test is also proposed to ensure contaminated groundwater is not leaking through the slurry or SSP walls. A detailed discussion of the investigations can be found in the following sections.

### 4.1 AOC-1: Unconsolidated Fill Zone (Shallow) Groundwater

Historically, several compounds have been found to exceed the NJDEP GWQS in groundwater samples from the five monitoring wells located within the acquisition area. To assess the current condition of the groundwater within the acquisition area, one round of groundwater samples will be collected from the four monitoring wells (MW-110R, MW-119R, MW-122, and MW-123R) present within the 20-acre parcel as shown on **Figure 5**. Prior to groundwater sampling, a headspace vapor reading will be recorded with a photoionization detector (PID) and groundwater levels will be collected using an electronic water level meter to verify groundwater flow direction. Groundwater samples from each monitoring well will be collected using the low-flow purging methodology in accordance with the NJDEP 2005 FSPM. The pump intake location will be located approximately at the middle of the water column. Drawdown of the water column will be monitored using an electronic water level indicator and the rate of the pump will be adjusted to maintain a drawdown of less than 0.3 ft, to the extent possible. The flow rate will be such that it does not exceed 500 milliliter (mL)/ minute or fall below 100 mL/minute. During the sampling event, groundwater will be purged from each well using a submersible pump with clean, dedicated, disposable 1/8-inch to 1/4-inch Teflon-lined polyethylene tubing.

Water quality indicator parameters (WQIP) will be recorded on Low Flow Sampling Data Sheets every five minutes throughout the purge cycle to stabilize groundwater parameters prior to sample collection in accordance with N.J.A.C 7:18 Low Flow Purging and Sampling requirements and guidance. These parameters will consist of dissolved oxygen (DO), oxidation reduction potential (ORP), pH, specific conductivity, turbidity, and temperature. Groundwater samples will be collected when all WQIP have stabilized within their allowable ranges for at least three consecutive measurements. Final depth to groundwater level measurements will be taken for each well, after which the samples will be collected.

One sample will be collected from each monitoring well and analyzed for target compound list (TCL) volatile organic compounds (VOCs), base neutral acids (BNs), pesticides, herbicides (Pest/Herb), Ammonia (Total), Cyanide, Phenolics, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, and hexavalent chromium, as shown in **Table 1** below. The sampling data will help determine the current levels of contamination to establish baseline conditions.

**Table 1: Proposed Groundwater Sampling Summary**

Monitoring Well	Location	Analytical Parameters
MW-110R	20-acre Parcel	TCL-VOC+10, TCL-BNA+20, TCL-Pest/Herb, Ammonia, Cyanide Phenolics, PCB, TAL Metals, Hexavalent Chromium
MW-119R		
MW-122		
MW-123R		

## 4.2 AOC-3: Site Wide Surface Soils

Based on the historic soil contamination identified and the PDM cap, BEM is proposing to conduct a soil investigation and soil gas sampling to determine the current status of the soils present on-site and if vapor intrusion issues may be a concern for future structures. The proposed redevelopment of the property will include re-grading the site, constructing foundations and structures, and installing utilities and other infrastructure. Workers will come into contact with the PDM material and potentially the contaminated material below it during construction activities.

### 4.2.1 AOC-3: Soil Investigation

In order to develop appropriate health and safety protocols for the HASP and appropriate remedial actions for the proposed development for the RAWPA, five soil borings (SB-1 through SB-5) will be installed within the PDM on the 20-acre parcel as shown on **Figure 5**. These borings and samples are to characterize the current condition of the soil that will be encountered during redevelopment. Previously installed borings in this area were limited and did not cover the entire footprint of redevelopment. The soil borings will be advanced using a direct push technology (DPT) rig by a NJ-licensed driller. Soil cores in macro-core sleeves (4 or 5 ft) will be logged and screened with a PID by a qualified geologist. The PID readings, depth of reading, and lithologic data from each soil boring will be recorded in the log book. The locations for these proposed soil borings were selected based on the proposed improvements shown on the 10% Design Package for the NJ TRANSIT Micro Grid. Additionally, it was verified prior to selecting such locations that previous soil sampling information is not available at these proposed locations.

Three soil samples will be collected from each boring (15 samples total) to confirm the presence/absence of any contamination within the PDM material in TRANSIT's proposed development area as part of establishing baseline conditions. The soil samples will be collected from varying depths to provide a complete soil profile throughout the acquisition area. The soil samples will be analyzed for TCL-VOCs, BNAs, Pest/Herb/PCBs, TAL metals, cyanide, hexavalent chromium, pH, and New Jersey Extractable Petroleum Hydrocarbons (NJEPH). Up to five samples with the highest concentrations will also be analyzed for toxicity characteristic leaching procedure (TCLP).

The depths for these samples will be decided based on PID readings, olfactory and visual observations, and if neither of these indicates contamination, the samples will be staggered in a manner to obtain a representative profile across the depth of the PDM. The table below provides the preliminary proposed depths for samples and may be changed in the field based on observations.

**Table 2: Proposed Soil Sample Summary**

Sample ID	Sample Location	PDM Sample Depth (ft)	Analytical Parameters	Sampling Method
SB-1A	20-acre parcel	0-5	TCL-VOC+10, TCL-BNA+20, TCL-Pest/Herb/PCBs, TAL Metals/Cyanide, Hexavalent Chromium, pH and NJEPH.	Geoprobe
SB-1B		10-15		
SB-1C		20-25		
SB-2A		5-10		
SB-2B		15-20		
SB-2C		25-30		
SB-3A		0-5		
SB-3B		10-15		
SB-3C		20-25		
SB-4A		5-10		
SB-4B		15-20		
SB-4C		25-30		
SB-5A		0-5		
SB-5B		10-15		
SB-5C		20-25		

#### 4.2.2 Soil Gas Sampling

The purpose of the soil gas samples is to ensure that there will be no vapor intrusion issues within the proposed buildings after construction or during the installation of the foundations of the buildings during construction. To evaluate potential vapors from the DNAPL on the eastern portion of the Site, three soil gas (SG-1, SG-2, and SG-3) samples biased to the proposed buildings' footprints on the 20-acre parcel will be collected (see **Figure 5**). The samples will be collected from the proposed footprint of the Main Facility Building (SG-2), the 230kv sub-station area (SG-3), and one closer to the eastern boundary (SG-1) in the area proposed for a storm water basin. The borings will be a minimum of 5 ft below the surface and above the capillary fringe in accordance with the NJDEP Vapor Intrusion Technical Guidance dated January 2018. The soil gas samples will be collected using sealed tubing and pumped into 1 Liter Summa canisters set on a 5-minute regulator to be analyzed for VOCs. If the results of the sampling indicate hazardous levels of soil gas contamination, the proposed structures may require the installation of a sub-slab depressurization system or other active or passive treatment methods.

#### 4.3 AOC-7: Sediments – Slurry Wall and Steel Sheet Pile Wall Testing

The slurry wall and SSP wall were installed to contain the contaminated groundwater on-site. The slurry wall was installed from 3 ft bgs to 25 ft bgs approximately 10 ft south of the SSP wall. It was keyed into the varved clay layer a minimum of 3 ft and has a permeability ranging from  $10^{-6}$  cm/s to  $10^{-7}$  cm/s. The SSP wall was installed to 30 ft bgs and Adika Grout was injected into the joints. The wall was designed to have a permeability equal to or less than  $10^{-6}$  cm/s; however, some weeping of the interlock joints or leakage through the seams is possible. The most recently reviewed Remedial Action Progress Reports (RAPR) (Key, 2012) data for the Site indicates that the slurry wall and SSP wall are functional and are not leaking. In order to confirm that the walls are not leaking and allowing contaminated groundwater to enter the Hackensack River, BEM

proposes to conduct a tracer dye test along the walls. Surface water and sediment sampling will also be conducted in the Hackensack River to evaluate if any past releases from the walls have impacted the river.

#### 4.3.1 Tracer Dye Test

Prior to conducting the tracer dye test, a NJDEP Discharge to Groundwater (DGW) Permit-By-Rule (PBR) Application detailing the dye test will be submitted to NJDEP (draft included in **Appendix A**). The tracer dye test will be conducted by injecting Cole-Parmer Fluorescent Red Dye into MW-119R and two other temporary injection points (TWP-1 and TWP-2) installed for this test as shown on **Figure 5**. The temporary injection points will increase the extent of the dye and allow a longer section of wall to be inspected. The temporary injection points will be constructed of 1-inch diameter PVC and will be installed according to N.J.A.C. 7:9D specifications. These points will be unpermitted so they will be abandoned within 48 hours in accordance with the NJDEP FSPM. The temporary injection points will be installed on either side of MW-119R to the east and west and south of the slurry wall to a similar depth as the existing monitoring well (11 ft). Groundwater is assumed to be encountered at approximately the same depth as in MW-119R.

At the start of the injection program, water will be added through a funnel to each injection point to prevent loss of dye to the inside of the casing. BEM is proposing to use Cole-Parmer Fluorescent Red Dye Tablets. According to the Cole-Parmer website, the minimum detectable concentration of the dye in clear water is 1ppm. Each tablet requires 60-gallons of water to create the minimum detectable concentration. BEM is proposing to only use 4 gallons of water per tablet to create a concentration of 15 ppm to ensure the dye is detectable. The tablet will be dissolved in the 4 gallons of water inside a large bucket and pumped into the injection point using a peristaltic pump. The entire volume of dye will be added at one time and flushed with a gallon of clean water. This procedure will be repeated at the other two injection points. After injection, BEM will monitor the slurry and SSP walls to determine if the dye is detected on the outside of the walls along the Hackensack River. If the dye is detected on the outside of the wall, it is evidence that the walls are compromised and that contaminated groundwater may be discharging to the Hackensack River.

#### 4.3.2 Surface Water, Sediment, and SSP Wall Sampling

Remedial activities conducted in 2008 and 2009 have removed approximately 30,000 cubic yards of contaminated sediments. However, potential seepage from the SSP and slurry walls and contamination from the river may have impacted the sediments that are currently present along the Site. During the construction of the proposed outfalls, workers may come into contact with the surface water/ sediment along the river and along the drainage basin. BEM proposes to conduct surface water/ sediment sampling to obtain baseline data to protect the workers installing the outfalls in these areas. A grab surface water sample (SW-1) from the Hackensack River and two sediment samples (SED-1A and SED-1B) will be collected from the same location at different depths (0 – 0.5, and 1 – 1.5 ft) from the river sediments to the north of MW-119R, and from close proximity to the SSP wall as shown on **Figure 5**. The sediment samples will be collected using a stainless steel decontaminated bucket auger and the sample will be placed directly into laboratory provided sample jars. The surface water sample will be analyzed for TCL VOCs, BNs, Pest/Herb, NJEPH, Ammonia (Total), Cyanide, Phenolics, PCBs, TAL metals, and hexavalent chromium. The sediment samples will be analyzed for TCL-VOCs, BNAs, Pest/Herb/PCBs, TAL metals, cyanide, hexavalent chromium, pH, NJEPH, and total organic carbon content.

During the collection of the surface water and sediment samples, the SSP wall in the vicinity of the sampling locations will be observed. If there are any signs of a weeping discharge from the SSP wall, a sample of the discharge will be collected and analyzed for the same parameters as the surface water samples. The SSP will also be photo documented for current conditions.

#### **4.4 Investigation Derived Waste**

All investigation derived waste (IDW), including soil cuttings from the installation of the soil borings and temporary injection points and purge water from groundwater sampling, will be containerized in United States Department of Transportation (DOT) approved 55-gallon steel drums. HCIA will determine the acceptable location of the temporary IDW storage area and this area will be managed as per the terms of the Access Agreement executed between HCIA and NJ TRANSIT. The drums will be stored and secured at a pre-approved location on site within a lined and bermed area and covered with liner until off-site disposal by NJ TRANSIT.

#### **4.5 Site Restoration**

All soil borings will be backfilled and patched at the surface upon completion of field activities in accordance with N.J.A.C 7:9D-3.1 and 3.4. The boreholes will be resurfaced with material to match the existing ground surface. Currently six inches of clean stone underlain by a geotextile, has been placed over the surface of the twenty acre parcel for the purpose of dust control. Upon completion of the investigation, any stone and geotextile disturbed will be replaced and restored.

#### **4.6 Health and Safety**

BEM will coordinate with NJ TRANSIT and HCIA to access the site for completing the proposed activities. Site visitors will be required to report to the BEM Field Manager prior to accessing the site or work zones. All visitors shall be escorted throughout the site by BEM's Field Manager and/or a representative of the contractor. An onsite Health and Safety Officer (HSO) will be present at all times for the duration of the activity. All visitors/workers will be required to obtain a job safety briefing and sign off with the HSO prior to beginning work. HCIA's consultants and contractors will have access to the site to observe the investigative activities.

All fieldwork will be performed in compliance with BEM's project-wide HASP. In addition, any subcontractor working on the project (e.g., drillers) will also prepare a HASP to be followed by their field personnel. All field personnel, including subcontractors, will be required to adhere to the HASP. Level D personal protective equipment (PPE), including hard hat, steel toe work boots, nitrile gloves (as applicable when sampling), safety glasses, hearing protection (around heavy equipment), and high visibility reflective vest will be utilized during all field activities. A job safety briefing will be conducted at the beginning of each day summarizing the work to be completed and also any potential hazards.

## **5.0 QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) PROCEDURES**

### **5.1 DQOs**

Data Quality Objectives (DQOs) for the project equates to the reliability of analytical data collected during the investigation and will be subject to the following standards for a measure of quality:

- Precision;
- Accuracy;
- Representativeness;
- Completeness; and
- Comparability.

Laboratory quality assurance (QA) efforts are aimed primarily at ensuring that analytical procedures provide sufficient accuracy and precision to quantify contaminant levels in environmental samples. The laboratory shall also ensure portions are representative of each sample, and that the results obtained from analysis of each sample are comparable to those obtained from analysis of other similar samples. Technical data validation will be conducted to evaluate laboratory compliance with selected methodologies and to verify the accuracy of the results. The analytical laboratory's Quality Assurance Manual (QAM) and the standard operation procedures (SOP) of analytical methods will maximize the production of usable and legally defensible data of known and acceptable quality with regard to the project objectives and NJDEP cleanup requirements.

### **5.2 Quality Control Samples**

Quality control samples (i.e., field blanks, trip blanks, duplicate samples) will be collected in accordance with the requirements of NJDEP FSPM. BEM will collect field blanks for the soil and aqueous samples at a rate of one field blank per day. BEM will utilize one trip blank per sample shipment with aqueous VOC samples. BEM will also collect duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples at a minimum rate of one for every 20 samples (5% of total) and will submit these to the laboratory as "blind" samples. In accordance with the NJDEP Data of Known Quality Protocols (DKQP), one field duplicate will be collected for every 20 soil gas samples. Trip blanks, field blanks, and MS/MSD samples are not needed for the soil gas samples.

### **5.3 Sample Handling/Analysis/Methodology**

Samples collected as part of the delineation efforts will be analyzed by Chemtech at a standard turnaround time (TAT). All samples being submitted to Chemtech will be stored in a cooler maintained at a temperature of no more than 4°C. The proposed analytical parameters and methods are summarized in the **Table 3** below.



**Table 3 – Analytical Methods Summary Table**

Matrix	Analytical Parameter	Analytical Method
Soil/Solid	TCL-VOC+10	SW846-8260
	TCL-BNA+20	SW846-8270
	Pesticides	SW846-8081
	Herbicides	SW846-8151
	PCBs	SW848-8082
	TAL-Metals	SW846-6010B/7471A
	Phenolics	420.1
	Cyanide	9012
	NJEPH	NJ EPH
	Hexavalent Chromium	7196
	pH	9045
Groundwater/ Surface Water	TCL-VOC+10	SW846 8260B
	TCL-BNA+20	SW846-8270
	Pesticides	SW846-8081
	Herbicides	SW846-8151
	PCBs	SW846-8082
	TAL Metals	SW846-601B/7471A
	Phenolics	420.1
	Ammonia	350.1
	Cyanide	9012
	Hexavalent Chromium	7196
Soil Gas	TCL-VOC+10	TO-15
Sediment	TCL-VOC+10	SW846-8260
	TCL-BNA+20	SW846-8270
	Pesticides	SW846-8081
	Herbicides	SW846-8151
	PCBs	SW848-8082
	TAL-Metals	SW846-6010B/7471A
	Cyanide	9012
	EPH	NJ EPH
	Hexavalent Chromium	7196
	pH	9045
	Total Organic Carbon	9060

#### 5.4 Data Review and Validation

Analytical data will be supplied to BEM by Chemtech in the designated electronic format for automatic upload into ETrak/QC Central<sup>®</sup>. Upon its receipt, BEM’s QA/ Quality Control (QC) staff will review and validate the laboratory data to verify that the results are within the established QC acceptance criteria as dictated by the associated test methodology and the appropriate, corresponding validation protocols. This data review and validation will adhere to the standard protocols provided by the NJDEP Bureau of Environmental Measurement and Quality Assurance (BEMQA) and USEPA method-specific protocols.

#### 5.5 Schedule

BEM will perform the proposed investigation activities following NJ TRANSIT’s approval of this PCIWP. Field activities will commence upon authorization to proceed and are expected to take approximately 15 days to complete. Upon completion of the investigation activities described in this PCIWP, BEM will prepare the RAWPA to summarize the results.

## **6.0 FOLLOW UP ACTIONS**

After the proposed investigation is completed, the findings and results will be incorporated into the RAWPA addendum for the proposed development. The RAWPA addendum will be used to provide the NJ TRANSIT-selected General Contractor for the proposed development a defined set of procedures to be employed when contaminated soil and groundwater are encountered during the construction activities. The RAWPA addendum will include NJ TRANSIT's remedial actions for the proposed development including a final cap for soil contamination, cap monitoring, etc. NJ TRANSIT will assign an LSRP to the site to ensure the remedial actions are conducted in accordance with state regulations and to oversee any required monitoring. Beazer will remain responsible for remediating the soil, sediment, surface water and groundwater contamination present on-site. NJ TRANSIT will provide access to the five monitoring wells located on the acquisition areas to Beazer for any require monitoring.

## 7.0 REFERENCES

- BEM Systems, Inc. *Koppers Seaboard Property Environmental Evaluation Report, October 2016.*
- BEM Systems, Inc., *Supplemental Remedial/ Pre-Design Investigation Workplan – Proposed Kearny Yard, June 2010.*
- Field & Technical Services, *Fourth Quarter 2015 Quarterly Groundwater Monitoring and Progress Report, April 29, 2016.*
- ITEX, *Letter Workplan, June 4, 1997.*
- Key Environmental, Inc., *Remedial Action Workplan, April 1998.*
- Key Environmental, Inc., *Remedial Action Report, August 2011.*
- Key Environmental, Inc., *Remedial Action Progress Report, June 7, 2012.*
- Key Environmental, Inc., *Remedial Action Progress Workplan Addendum, 2013.*
- Keystone Environmental Resources, Inc., *Phase I Investigation, 1986.*
- Keystone Environmental Resources, Inc., *Remedial Investigation, August 1987.*
- Keystone Environmental Resources, Inc., *Remedial Investigation, July 1988.*
- Keystone Environmental Resources, Inc., *Waste Pile Inventory Report, 1989.*
- Keystone Environmental Resources, Inc., *Construction Documentation Report and Engineers/ Operators Certification, 1990.*
- Keystone Environmental Resources, Inc., *Remedial Action Supplemental Sampling Plan, November 1990.*

## 8.0 ACRONYMS

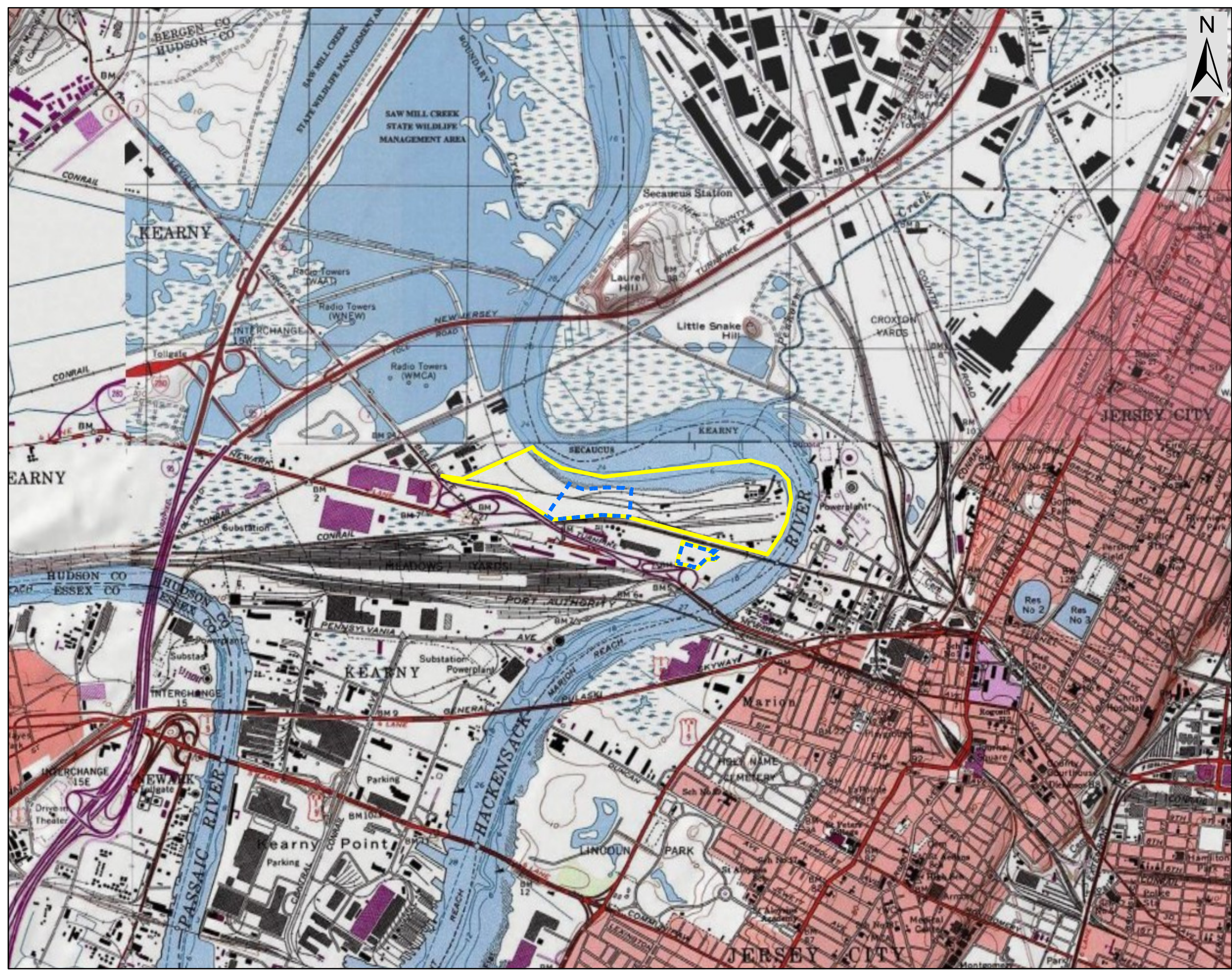
ACO	Administrative Consent Order
AOC	Area of Concern
ARRCS	Administrative Requirements for the Remediation of Contaminated Sites
Beazer	Beazer East, Inc.
BEM	BEM Systems, Inc.
BEMQA	Bureau of Environmental Measurement and Quality Assurance
bgs	Below Ground Surface
BNA	Base Neutral and Acid Extractable Organic Compound
CEA	Classification Exception Area
cm/s	Centimeters Per Second
COC	Contaminant of Concern
COPR	Chromium Ore Processing Residues
DGW	Discharge to Groundwater
Dia	Diameter
DKQP	Data of Known Quality Protocols
DNAPL	Dense Non-Aqueous Phase Liquids
DO	Dissolved Oxygen
DOT	Department of Transportation
DPT	Direct Push Technology
DQO	Data Quality Objectives
FSPM	Field Sampling Procedures Manual
Ft	Feet
FTS	Field and Technical Services
GCL	Geosynthetic Clay Layer
GLDD	Great Lakes Dredge and Dock Company
GWQS	Groundwater Quality Standards
HASP	Health and Safety Plan
HCIA	Hudson County Improvements Authority
IDW	Investigative Derived Waste
Key	Key Environmental, Inc.
Koppers Site	Former Koppers Seaboard Site
LSRP	Licensed Site Remediation Professional

M&E	Morris and Essex
mL	milliliter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
msl	Mean Sea Level
N.J.A.C.	New Jersey Administrative Code
N.J.S.A.	New Jersey Statutes Annotated
NJ	New Jersey
NJDEP	New Jersey Department of Environmental Protection
NJMC	New Jersey Meadowlands Commission
NJ TRANSIT	New Jersey Transit Corporation
NRDCSCC	Non-Residential Direct Contact Soil Cleanup Criteria
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standard
ORP	Oxidation Reduction Potential
PAH	Polycyclic Aromatic Hydrocarbons
PBR	Permit By Rule
PDM	Processed Dredge Material
PCIWP	Pre-Construction Investigation Work Plan
Pest/Herb/PCBs	Pesticides, Herbicides, and Polychlorinated Biphenyls
PI	Program Interest
PID	Photoionization Detector
PPE	Personal Protective Equipment
PS&S	Paulus Sokolowski and Sartor, LLC
psf	pounds per square foot
PVC	Polyvinyl Chloride
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RAPR	Remedial Action Progress Report
RAWP	Remedial Action Work Plan

RAWPA	Remedial Action Work Plan Addendum
RCRA	Resource Conservation and Recovery Act
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCC	Soil Cleanup Criteria
SCCC	Standard Chlorine Chemical Company, Inc.
SOP	Standard Operating Procedures
SRRA	Site Remediation Reform Act
SSP	Steel Sheetpile
SVOC	Semi Volatile Organic Compound
SWQC	Surface Water Quality Criteria
TAL	Target Analyte List
TAT	Turnaround Time
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TransitGrid	New Jersey TransitGrid Project
TRSR	Technical Requirements for Site Remediation
TWP	Temporary Well Point
USEPA	United States Environmental Protection Agency
VI	Vapor Intrusion
VOC	Volatile Organic Compound
WQIP	Water Quality Indicator Parameter

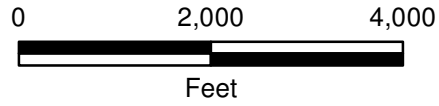
FIGURES

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**Legend**

- Property Boundary
- - - Proposed Acquisition Area



Service Layer Credits:  
Copyright: © 2013 National Geographic Society



**NJ TransitGrid Pre-Construction Investigation Work Plan**

**Figure 1: Topographic Map**

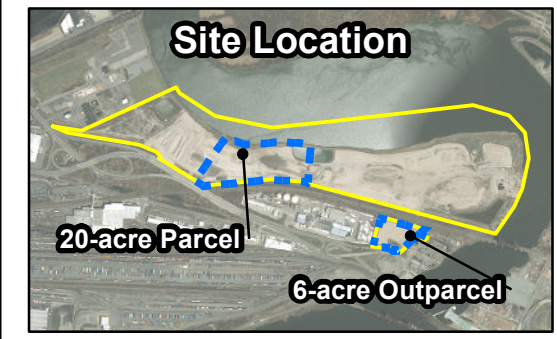
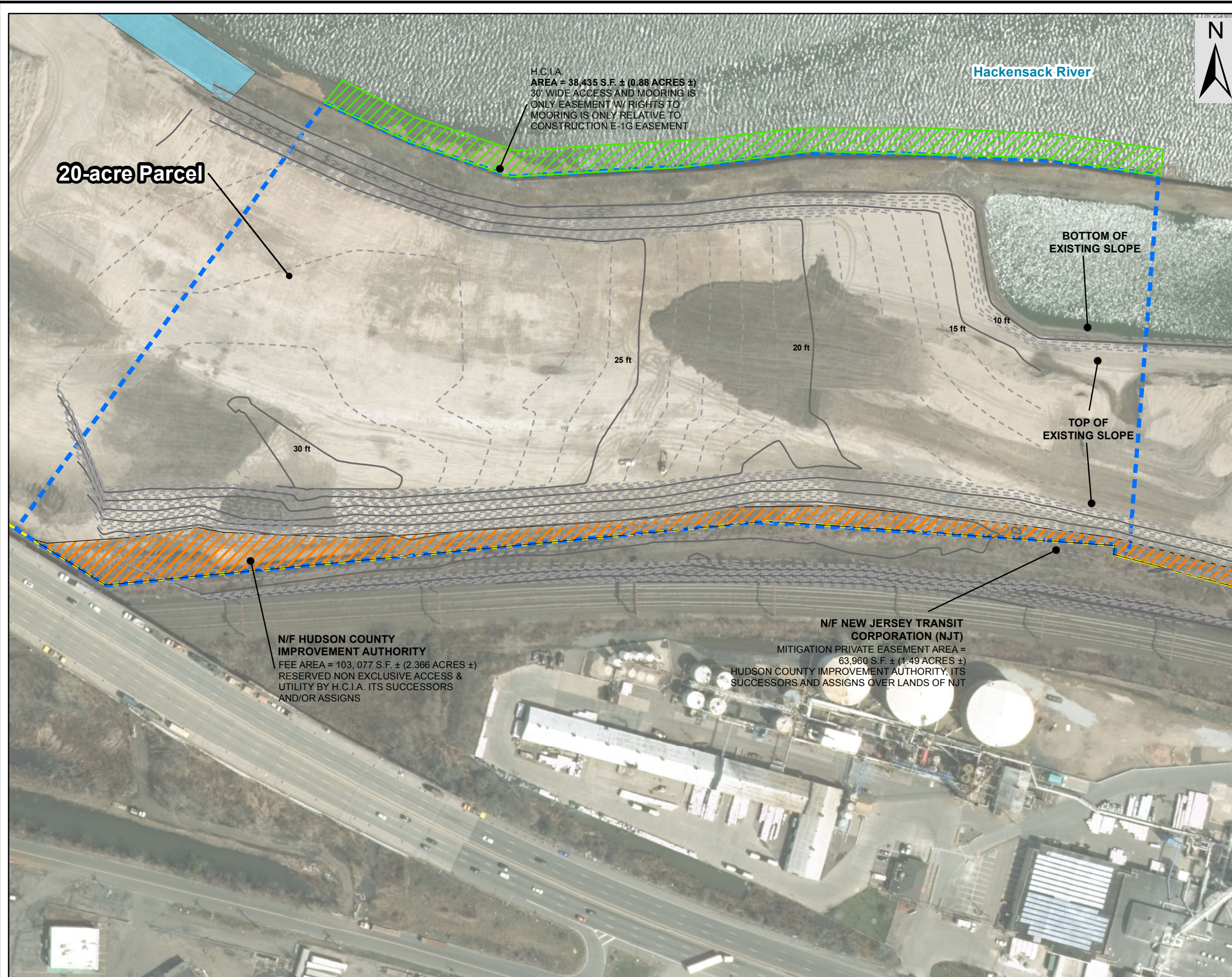
**Project No.:**  
TIERIII-1041

**Date:**  
June 2018

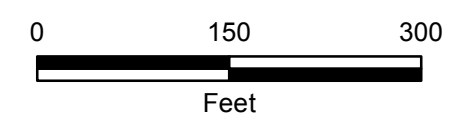


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- Legend**
- Property Boundary
  - Proposed Acquisition
  - Major Elevation Contour (5 ft)
  - Minor Elevation Contour (1 ft)
  - Wetlands to Be Field Verified
  - Wetlands on Koppers Site
  - Drainage and Mooring Easement Line



Service Layer Credits:  
 Acquisition Area: NAIK (2017)  
 Aerial: NJGIN (2015)



**NJ TransitGrid Pre-Construction Investigation Work Plan**

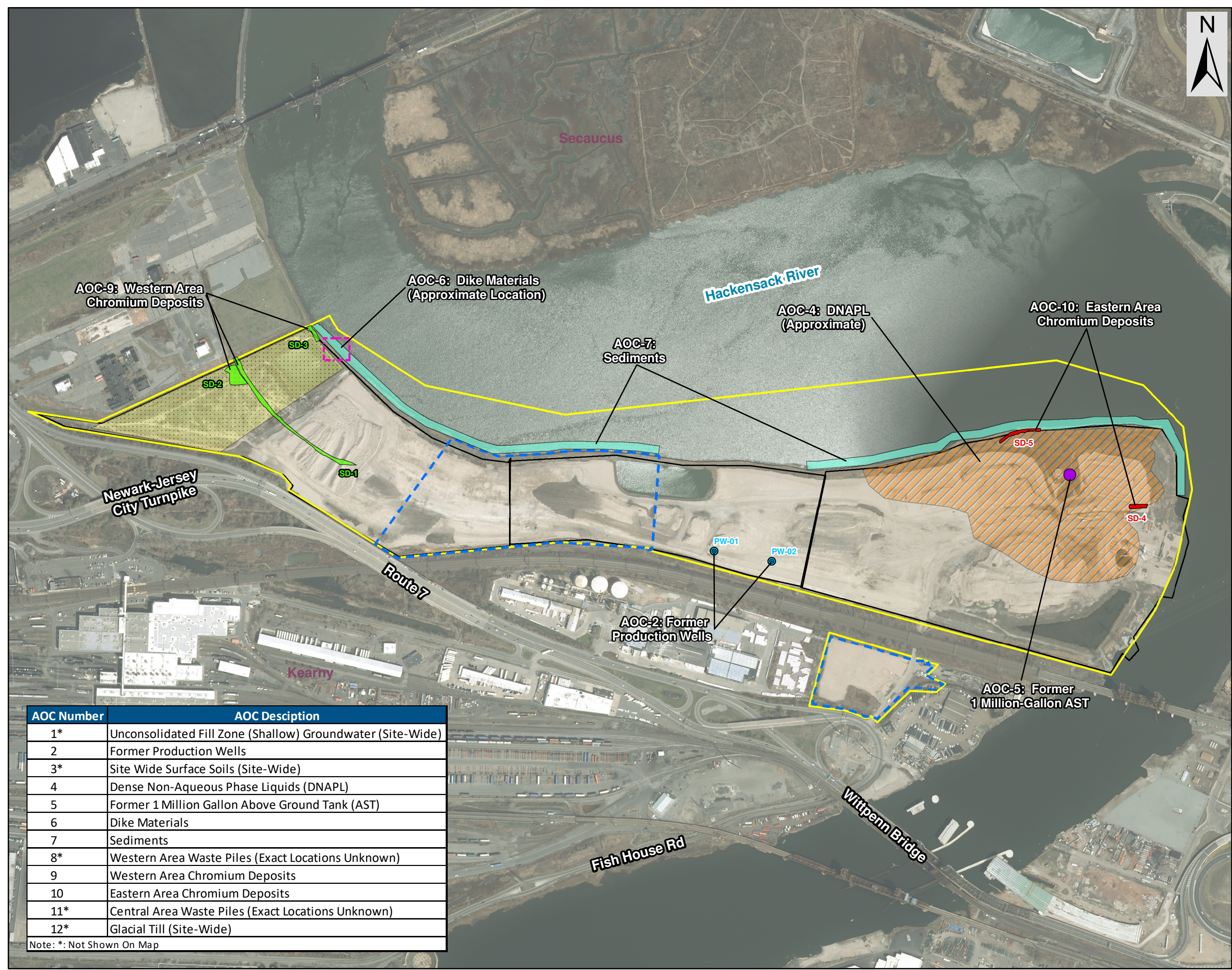
**Figure 2: Site Map**

**Project No.:**  
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**Date:**  
 June 2018



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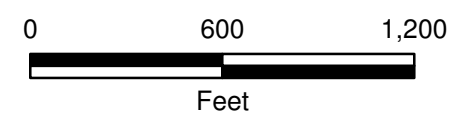


AOC Number	AOC Description
1*	Unconsolidated Fill Zone (Shallow) Groundwater (Site-Wide)
2	Former Production Wells
3*	Site Wide Surface Soils (Site-Wide)
4	Dense Non-Aqueous Phase Liquids (DNAPL)
5	Former 1 Million Gallon Above Ground Tank (AST)
6	Dike Materials
7	Sediments
8*	Western Area Waste Piles (Exact Locations Unknown)
9	Western Area Chromium Deposits
10	Eastern Area Chromium Deposits
11*	Central Area Waste Piles (Exact Locations Unknown)
12*	Glacial Till (Site-Wide)

Note: \*: Not Shown On Map

**Legend**

- Property Boundary
- Proposed Acquisition
- AOC-2: Former Production Wells
- AOC-4: Approximate Area of DNAPL Contamination
- AOC-5: Former 1-Million Gallon AST
- AOC-7: Sediments
- AOC-9: Western Area Chromium Deposits
- AOC-10: Eastern Area Chromium Deposits
- Approximate Area of Chlorinated DNAPL from off-site (Under EPA Investigation)



Service Layer Credits:  
 Acquisition Area: NAIK (2017)  
 Aerial: NJGIN (2015)  
 AOCs: Historic Beazer Reports

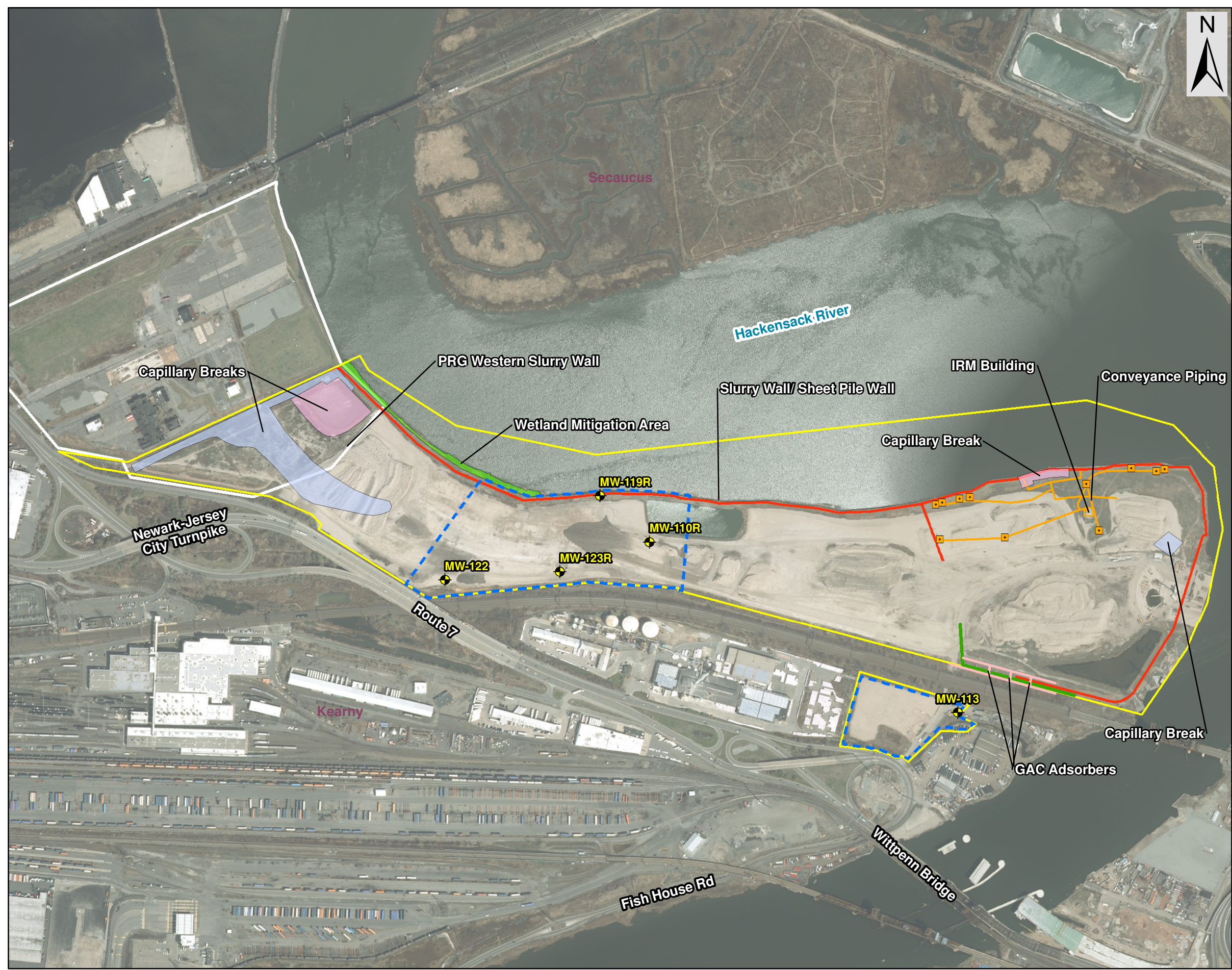


**NJ TransitGrid Pre-Construction Investigation Work Plan**

**Figure 3: Areas of Concern Map**

<b>Project No.:</b> TIERIII-1041	<b>Date:</b> June 2018
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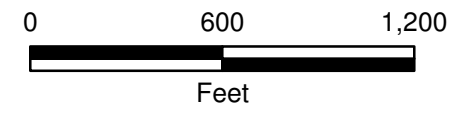
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**Legend**

- Shallow Zone Monitoring Well
- Geomembrane Capillary Break
- Gravel Capillary Break
- Granulated Activated Carbon (GAC) Adsorbers
- Beazer Funnel and Gate System
- Proposed Acquisition Area
- Property Boundary
- IRM Recovery Well
- Slurry Wall/ Sheet Pile Wall
- IRM System Conveyance Piping
- Wetland Mitigation Area
- PRG Western Slurry Wall

Notes:  
 1. CEA is established site-wide.  
 2. A Deed Notice has been proposed for site-wide



Service Layer Credits:  
 Property Acquisition Area: NAIK (2017)  
 Aerial: NJGIN (2015)  
 Remedial Actions: Historic Beazer Reports

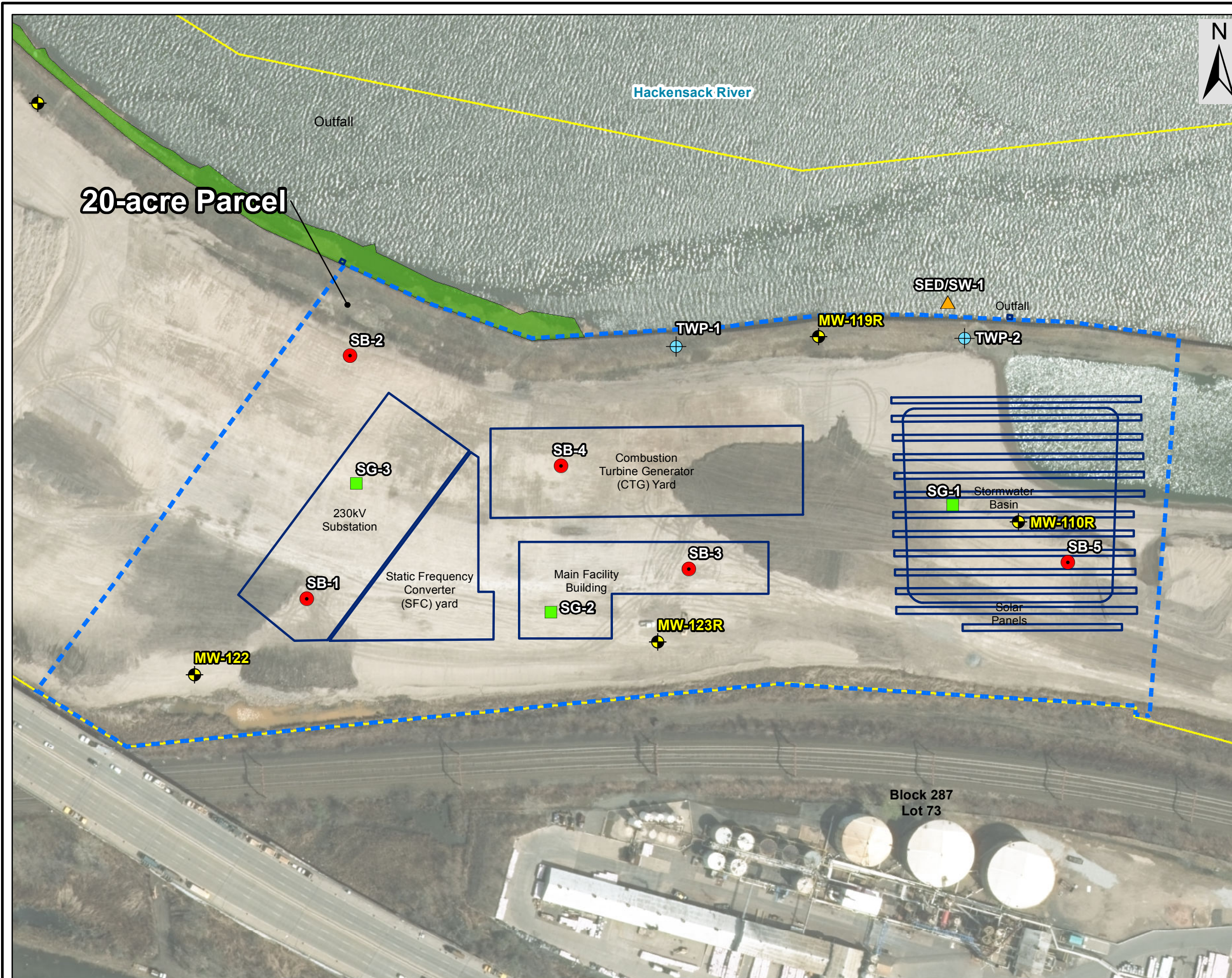


**NJ TransitGrid Pre-Construction Investigation Work Plan**

**Figure 4: Remedial Action Map**

<b>Project No.:</b> TIERIII-1041	<b>Date:</b> June 2018
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**Legend**

- Existing Monitoring Wells
- Proposed Samples**
- Soil Boring
- Temporary Tracer Injection Point
- Sediment/Surface Water
- Soil Gas
- Property Boundary
- Proposed Acquisition Area
- Proposed Main Facility Layout
- Wetland Mitigation Area

Service Layer Credits:  
 Acquisition Area: NAIK (2017)  
 Aerial: NJGIN (2015)



**NJ TransitGrid Pre-Construction Investigation Work Plan**

**Figure 5:  
Proposed Sample Locations**

<b>Project No.:</b> TIERIII-1041	<b>Date:</b> June 2018
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**APPENDIX A**

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*Discharge to Groundwater Permit-By-Rule Application*

DATE  
TIERIII-1041

Bureau of Case Assignment & Initial Notice  
Site Remediation Program  
New Jersey Department of Environmental Protection  
401-05H  
PO Box 420  
Trenton, NJ 08625-0420

**Re: Discharge to Groundwater Proposal  
Former Koppers Seaboard Site  
1 Fish House Road, Hudson County, NJ 070326  
NJDEP SRP Preferred Identification #: G000001985, Case No. NJD00244512**

To Whom It May Concern:

BEM Systems, Inc. (BEM), on behalf of the New Jersey Transit Corporation (NJ TRANSIT), requests authorization to conduct a tracer dye test using Cole-Parmer Fluorescent Red Dye at the Former Koppers Seaboard Site (Koppers Site) located at 1 Fish House Road, Hudson County, New Jersey. NJ TRANSIT is in the process of acquiring approximately 26 acres of the Koppers Site to construct the NJ TransitGrid Project. The proposed Project would include a natural gas fired electric power generating plant and the electrical lines and substations to distribute the power to provide a resilient energy supply for a targeted portion of rail infrastructure in times when the centralized power grid is compromised. The Koppers Site is a Known Contaminated Site and is listed under New Jersey Department of Environmental Protection (NJDEP) Program Interest (PI) Number G000001985. Mr. John T. Bolan (LSRP License Number: 577508) of Paulus Sokolowski and Sartor, LLC (PS&S) has been the assigned LSRP since May 1, 2012.

As part of acquisition activities, NJ TRANSIT is conducting a limited investigation to identify the current site conditions and the status of the remedial actions at the site. The tracer dye test will allow BEM to ensure that the current steel sheetpile (SSP) wall and slurry wall are intact and preventing contaminated groundwater from flowing into the Hackensack River. The proposed dye for the tracer dye test is biodegradable and non-toxic and will not negatively impact the aquifer. The proposed injection will utilize one existing monitoring well and two temporary injection points. Tracer dye activities be completed within one work week. This application follows the requirements of the New Jersey Administrative Code (N.J.A.C.) 7:14A-7.5 and 8.5, the Technical Requirements for Site Remediation, specifically N.J.A.C 7:26E-5.6 and the New Jersey Discharge Elimination System (NJPDES) Discharge to Ground Water (DGW) Technical Manual for the Site Remediation Program (SRP).

Included with this letter is a Discharge to Groundwater Permit By Rule Request Form (DGW Form- **Attachment A**) and a check for the required Application Fee of \$350. The following sections provide additional details about the Site and the proposed injection program.

**Tables:**

- **Table 1** – Recent Groundwater Sampling Results

**Figures:**

- **Figure 1** – Topographic Map
- **Figure 2** – Site Map

- **Figure 3** – Injection Point Location Map

**Attachments:**

- **Attachment A** – Discharge to Groundwater Permit-By-Rule Authorization Request Form
- **Attachment B** – Safety Data Sheets

## 1.0 Site Background

The Koppers Site was previously utilized as a coke manufacturing and coal tar refining plant from approximately 1917 to 1979 (**Figures 1 and 2**). The property has been impacted with organic compounds and metals, with pockets of coal tar dense non-aqueous phase liquids (DNAPL) in the Eastern and some portions of the Central Area, chlorinated DNAPL in the Western Area, and Chromium Ore Processing Residues (COPR) used as fill material in the Western and a portion of the Eastern Areas. Soil, sediment, and shallow groundwater have been affected at areas throughout the Site. Based on previous investigations, deep groundwater does not appear to have been affected by former site activities. Additionally, areas of the western portion of the Site have been impacted by contaminants (specifically, chlorinated DNAPL and chromium) from the adjacent Standard Chlorine Chemical Company, Inc. (SCCC) property, which has been listed as a National Priorities List (Superfund) site. Accordingly, the SCCC site, including those areas of the western portion of the Koppers Site impacted by contaminants from the SCCC site, falls under the jurisdiction of the United States Environmental Protection Agency (USEPA).

Environmental investigations have been conducted at the Koppers Site since the 1980s. Prior to the LSRP program, the Site was being remediated under NJDEP oversight in accordance with a 1986 Administrative Consent Order (ACO) and a 1997 Memorandum of Understanding. Currently, the property is owned by the Hudson County Improvements Authority (HCIA), who is responsible for the final capping of the Site, but Beazer East, Inc. (Beazer), the former property owner, remains the responsible party for remediation. A Public Participation Plan was approved by NJDEP on March 31, 2017.

## 2.0 Summary of Groundwater Investigations

### 2.1 Formations Receiving Injections (Site Geology)

Based on the Remedial Investigation Report (RIR) (BEM, 2010), seven general overburden units have been identified at the acquisition areas at the Site as described below.

- **PDM** consisting of fine silts and organic sediments from harbor dredging or other operations mixed with processed materials (ash or cement). PDM has been spread over the Historic Fill across the majority of the property. This unit ranges in thickness from 20 to 30 ft.
- **Historic Fill** – Fill consisting of coarse to fine sand with varying proportions of gravel, clay, silt, organics, wood, glass, industrial plant process materials (slag, cinders, coke, coal, etc.) and brick. This unit ranges in thickness from 4 to 21 feet.
- **Meadow Mat** – These former marsh deposits comprise organic soils that include peat and organic silt and clay. The peat (commonly referred to as “Meadow Mat”) generally contains a greater percentage of fibrous vegetation. This unit is approximately 3 to 6 feet thick. The Meadow Mat is continuous across the property but is absent or very thin towards the southwest corner of the Site and Eastern Area.
- **Clayey Silt Loams** – An alluvial layer (clayey silty loams) is present in place of the Meadow Mat in the eastern area up to 45 feet (ft) thick. In general, the amount of organic materials decreases with depth while the amount of sand increases with depth.
- **Sand and Silts** – Beneath the peat and/or clayey silt layer is a fine to medium-grained sand unit with variable amounts of silt. This layer is thinner to the east and thickens to 20 feet in

the center of the Site. In general, sand is more prevalent to the west and silt is more prevalent to the east.

- **Varved Clay** – A layer of soft to very soft varved clay exists throughout the entire property beneath the fill and brown marsh deposit soils. The thickness of the entire stratum ranges from 40 to 65 feet thick along the western barrier wall; 30 to 53 feet thick along the eastern barrier wall; and 23 to 53 feet thick along the southern boundary.
- **Glacial Till** – A continuous stratum of glacial till underlies the property ranging from 5 to 26 feet thick. It mainly consists of varying amounts of gravel, sand, clay and occasional cobbles and boulders. The glacial till is typically dense to very dense.

## 2.2 Groundwater Flow (Hydrogeology)

There are four groundwater zones identified on-site including three overburden water bearing units (historic fill, sand/silt unit, and till layer) and the bedrock aquifer. Groundwater is present under water table conditions in the historic fill and under semi-confined conditions in the sand and silt unit. The Meadow Mat separates the historic fill and sand/silt unit throughout most of the Site, but does not eliminate a hydraulic connection. Additionally, the Historic Fill and sand/silt units are in direct contact where the Meadow Mat is absent in the southwestern portion of the project area. Based on previous reporting (Roy F. Weston, 1993 and others), shallow groundwater fluctuation occurs from tidal influences. The glacial till deep overburden water bearing zone is separated from the upper zones by the thick and continuous varved clay and silt unit. The bedrock aquifer is present approximately 60 ft bgs, although bedrock varies across the Site. Groundwater flow in bedrock is primarily through fractures in the Brunswick Formation (USEPA Region II Aquifer Reports).

Based on the RIR (BEM, 2010), local mounding occurs at eastern/central portions of the project area, while other flow is discharged at the Site periphery (river edge), especially to the north-northwest along the western portion of the Site. The groundwater in the sand unit below the Meadow Mat flows toward the south, which follows the migration of the Hackensack River and has a minimal hydraulic gradient. The Meadow Mat and the varved clay act as confining units, isolating the shallow groundwater system, and limiting the vertical movement of groundwater.

## 2.3 Nature and Extent of Contamination

Based on the RAWP (Key, 1998), shallow groundwater contamination of benzene, polycyclic aromatic hydrocarbons (PAHs), total and dissolved arsenic, total and dissolved manganese, total mercury, total and free cyanide, chlorobenzene, 1,4 dichlorobenzene, total and dissolved chromium, and total thallium is present in the Eastern, Central, and Western Areas of the Koppers Site. In the 1990's, a DNAPL Recovery System was constructed in the northeastern portion of the Site. An indeterminate timeframe groundwater classification exception area (CEA) for site-wide shallow groundwater was issued in 2011 and includes benzene, chlorobenzene, methylene chloride, total xylenes, 1,4-dichlorobenzene, 2,4-dimethylphenol, benzo(b)fluoranthene, hexachlorobenzene, indeno(1,2,3-cd)pyrene, aluminum, arsenic, chromium, iron, lead, manganese, nickel, and sodium.

Five monitoring wells are located on the NJ TRANSIT acquisition area with, monitoring wells MW-110R, MW-119R, MW-122, and MW-123R on the 20 acre parcel. Based on the information provided as part of the acquisition process, the four monitoring wells on the 20 acre parcel were sampled in June 2015. The results indicated that MW-110R exceeded the NJDEP Groundwater Quality Standard (GWQS) for benzene, MW-110R, MW-122, and MW-123 exceeded for arsenic, and all four wells exceeded for iron, manganese, and sodium. . DNAPL was not measured in any of these five monitoring wells during the last sampling events.



**Table 1: Recent Groundwater Sampling Results**

Monitoring Well	Sample Date	Compound	Standard (ug/L)	Result (ug/L)
MW-110R	June 2015	Benzene	1	15
		Arsenic	8	34
		Iron	300	15,000
		Manganese	50	51
		Sodium	50,000	2,400,000
		Chloride	250	4,000
MW-119R	June 2015	Iron	300	6,300
		Manganese	50	390
		Sodium	50,000	910,000
		Chloride	250	1500
MW-122	June 2015	Arsenic	8	9
		Iron	300	55,000
		Manganese	50	420
		Sodium	50,000	1,400,000
		Chloride	250	2,500
MW-123R	June 2015	Aluminum	200	250
		Arsenic	8	35
		Barium	2,000	3,700
		Iron	300	53,000
		Manganese	50	170
		Sodium	50,000	2,600,000

Note:

1. All results are compared to the September 1998 Groundwater Quality Standards (GWQS) as per approved RAWP. The report did include the November 2005 GWQS if the standard was reduced by an order of magnitude or more.
2. Some wells were also compared to the SE-2 SWQC. These criteria are noted in the table above with an asterisk (\*).

### 3.0 Proposed Injection

To determine if the shallow aquifer groundwater contamination from the south side of the slurry/ SSP wall is discharging north into the Hackensack River, BEM is proposing to conduct a tracer dye test. The tracer dye test will be conducted by injecting Cole-Parmer Fluorescent Red Dye into MW-119R and two other temporary injection points (TWP-1 and TWP-2) installed for this test (**Figure 3**). The temporary injection points will be constructed of 1-inch diameter PVC and will be installed according to N.J.A.C. 7:9D specifications. These points will be unpermitted so they will be abandoned within 48 hours in accordance with the NJDEP FSPM. The temporary injection points will be installed on either side of MW-119R to the east and west and south of the slurry wall to a similar depth as the existing monitoring well (11 ft). Groundwater is assumed to be encountered at approximately the same depth as in MW-119R.

At the start of the injection program, approximately 1 gallon of water will be added through a funnel to each injection point to prevent loss of dye to the inside of the casing. BEM is proposing to use Cole-Parmer

Fluorescent Red Dye Tablets. According to the Cole-Parmer website, the minimum detectable concentration of the dye in clear water is 1ppm. Each tablet requires 60-gallons of water to create the minimum detectable concentration. BEM is proposing to only use 4 gallons of water to create a concentration of 15 ppm to ensure that the dye is detectable. The tablet will be dissolved in the 4 gallons of water inside a large bucket and pumped into the injection point using a peristaltic pump. The entire volume of dye will be added at one time and flushed with a gallon of clean water. This procedure will be repeated at the other two injection points. The injection activities are expected to be completed in one day. After injection, BEM will monitor the slurry and SSP walls to determine if the dye is detected on the outside of the walls along the Hackensack River. The dye should be detected along the outside of the walls if the slurry/sheet pile walls have been compromised at any location.

The Cole-Parmer Fluorescent Red Dye (rhodamine WT) is non-toxic, non-carcinogenic, and is not classified as environmentally hazardous. The dye does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act. The dye is also biodegradable and will not negatively impact the aquifer. The Safety Data Sheet is included as **Attachment B**. Since the dye will not negatively impact the aquifer, post-injection sampling will not be conducted.

#### 4.0 Reporting

Details of the tracer dye test results will be submitted to the NJDEP following completion of the monitoring program as part of the DGW Permit-By-Rule Monitoring Report.

If you have any questions regarding this submittal or require further information, please contact me at 908-598-2600, extension 115 or at [mpatel@bemsys.com](mailto:mpatel@bemsys.com).

Sincerely,  
BEM Systems, Inc.

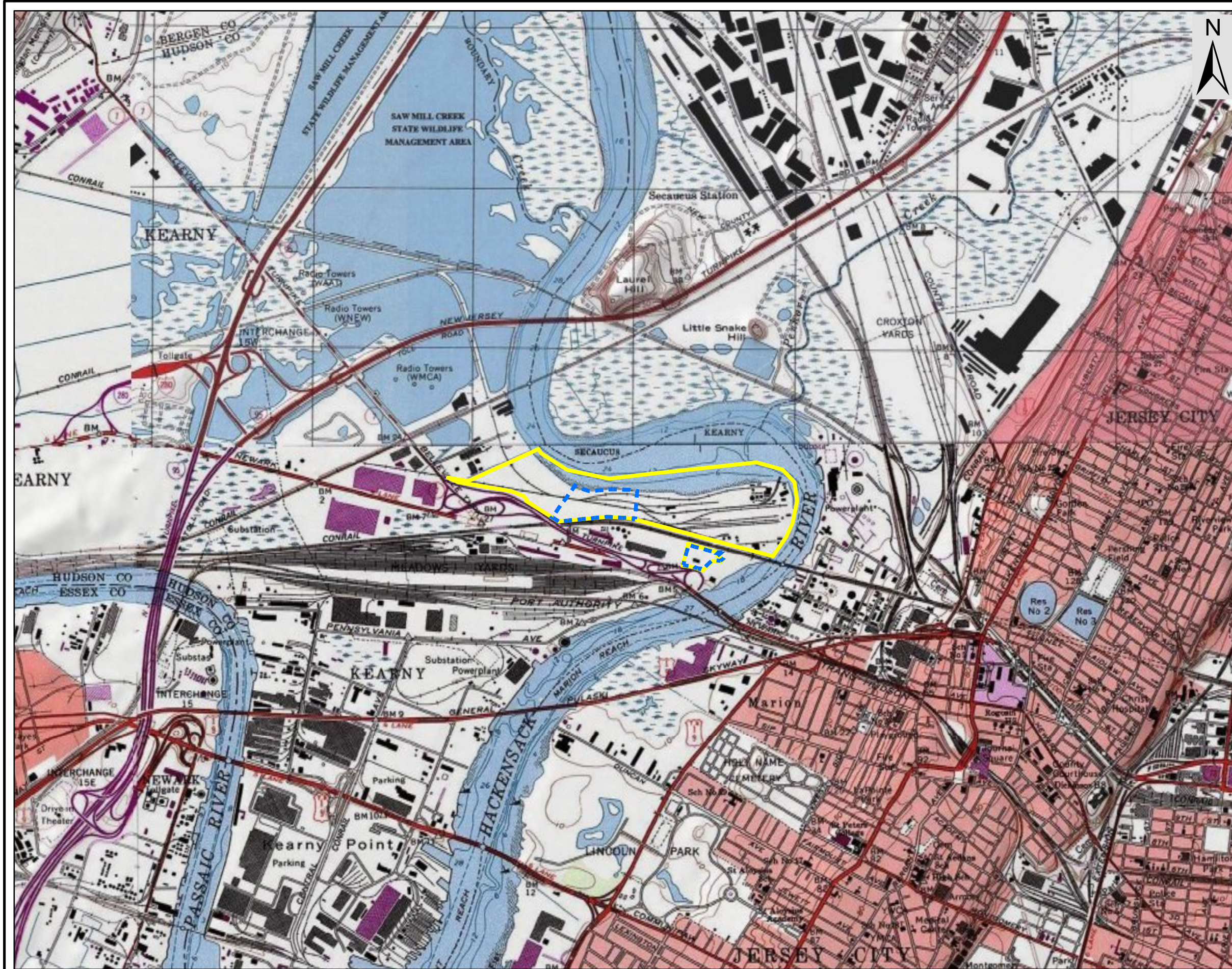
Mittul Pate, P.E., LSRP  
Vice President

Attachment

cc: J. Bolan (Site LSRP)  
J. Geitner (NJ TRANSIT)  
BEM File

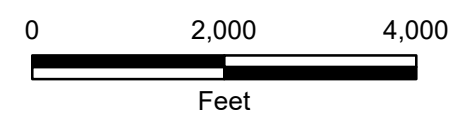
FIGURES

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**Legend**

- Property Boundary
- Proposed Acquisition Area



Service Layer Credits:  
Copyright: © 2013 National Geographic Society

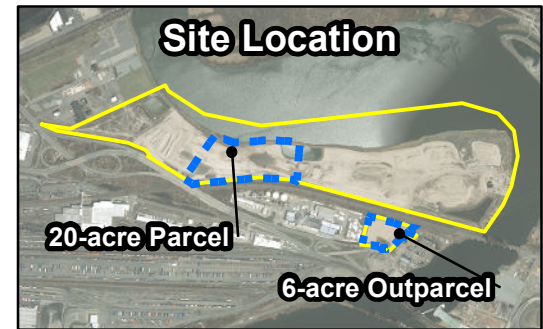
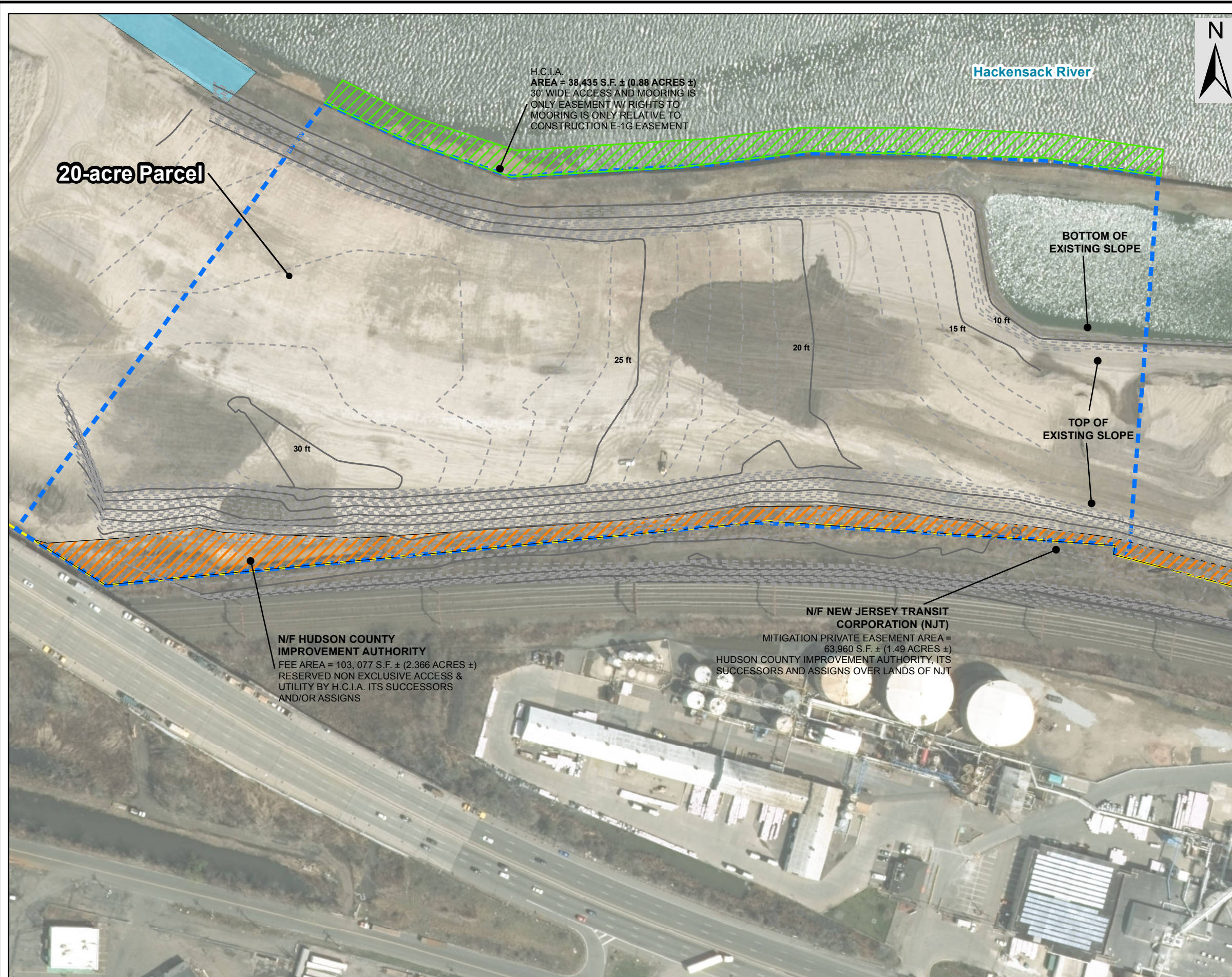


**NJ TransitGrid  
Discharge to Groundwater  
Permit-By-Rule Application**

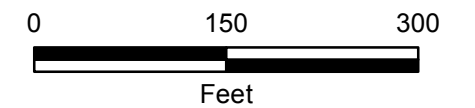
**Figure 1: Topographic Map**

<b>Project No.:</b> TIERIII-1041	<b>Date:</b> April 2018
-------------------------------------	----------------------------

**BEM** 100 Passaic Avenue  
Chatham, NJ 07928  
P. (908) 598-2600



- Legend**
- Property Boundary
  - Proposed Acquisition
  - Major Elevation Contour (5 ft)
  - Minor Elevation Contour (1 ft)
  - Wetlands to Be Field Verified
  - Wetlands on Koppers Site
  - Drainage and Mooring Easement Line



Service Layer Credits:  
Acquisition Area: NAIK (2017)  
Aerial: NJGIN (2015)



**NJ TransitGrid**  
Discharge to Groundwater  
Permit-By-Rule Application

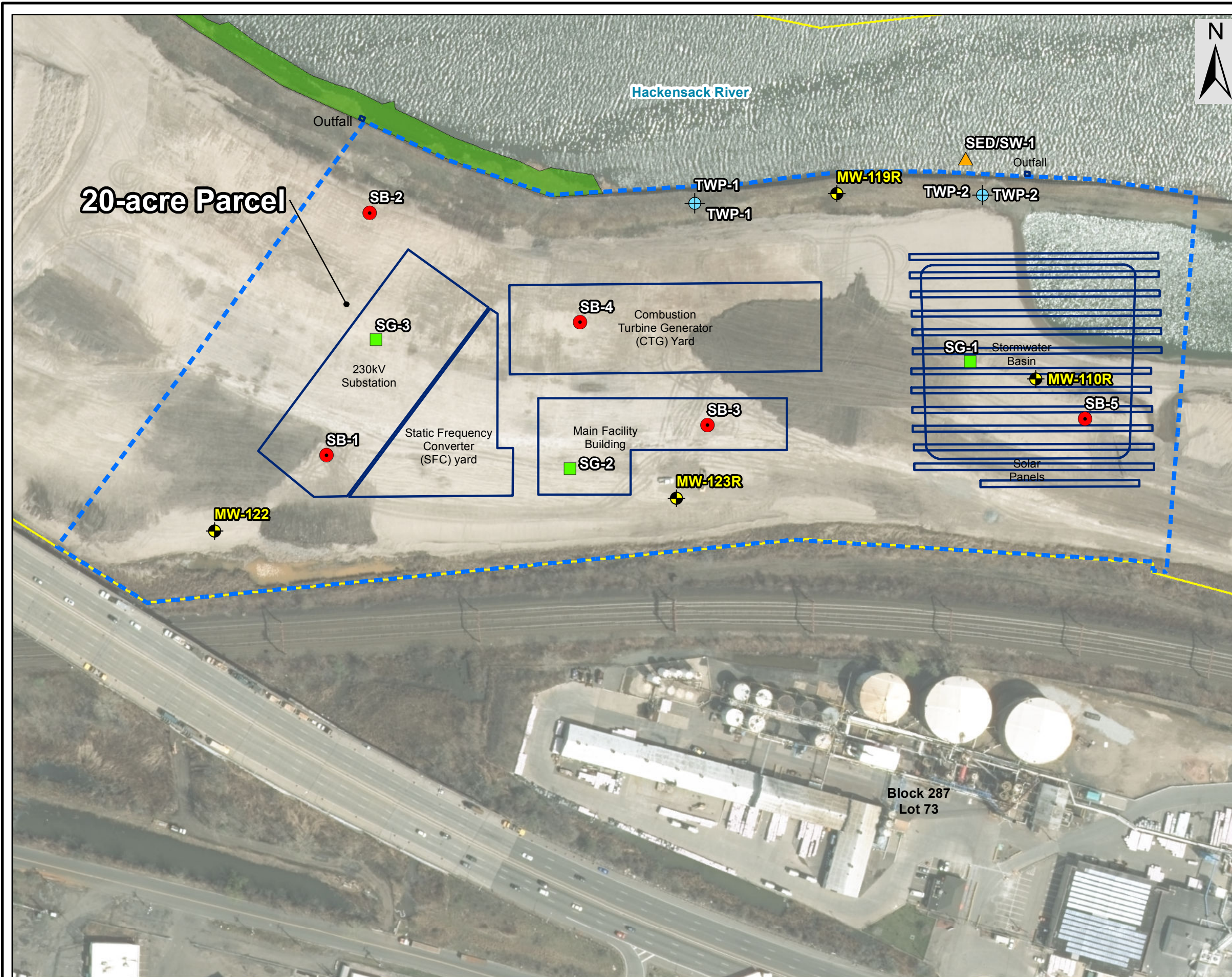
**Figure 2: Site Map**

**Project No.:**  
TIERIII-1041

**Date:**  
April 2018



100 Passaic Avenue  
Chatham, NJ 07928  
P. (908) 598-2600



**Legend**

**Revised Proposed Sample Locations**

**Proposed Samples**

- Temporary Tracer Injection Point
- Soil Boring
- Sediment
- Soil Gas
- Existing Monitoring Wells

**Proposed Samples**

- Temporary Tracer Injection Point
- Property Boundary
- Proposed Acquisition Area
- Proposed Main Facility Layout
- Wetland Mitigation Area



Service Layer Credits:  
 Acquisition Area: NAIK (2017)  
 Aerial: NJGIN (2015)



**NJ TransitGrid**  
 Discharge to Groundwater  
 Permit-By-Rule Application

**Figure 3:**  
 Proposed Sample Locations

**Project No.:**  
 TIERIII-1041

**Date:**  
 April 2018



100 Passaic Avenue  
 Chatham, NJ 07928  
 P. (908) 598-2600

**ATTACHMENT A**

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*Discharge to Groundwater Permit-By-Rule Authorization Request Form*



**New Jersey Department of Environmental Protection**  
 Site Remediation Program  
**DISCHARGE TO GROUND WATER (DGW) PERMIT-BY-RULE**  
**AUTHORIZATION REQUEST**

LSRP     Subsurface Evaluator (UHOT)

Date Stamp  
 (For Department use only)

**SECTION A. SITE NAME AND LOCATION**

Site Name: Former Koppers Seaboard Site  
 AKAs: Koppers Company, Inc. Seaboard Plant; Beazer East, Inc. Seaboard Site; Beazer East, Inc.  
 Street Address: One Fish House Road  
 Municipality: Town of Kearny (Township, Borough or City)  
 County: Hudson Zip Code: 07032  
 Program Interest (PI) Number(s): G000001985  
 Case Tracking Number(s) for this submission: NJD00244512

Municipal block(s) and lot(s) where the **proposed discharge(s)** would occur:  
 Block # 287 Lot #(s) 62 Block # \_\_\_\_\_ Lot #(s) \_\_\_\_\_  
 Block # \_\_\_\_\_ Lot #(s) \_\_\_\_\_ Block # \_\_\_\_\_ Lot #(s) \_\_\_\_\_

**SECTION B. FEE AND DISCHARGE INFORMATION**

DGW Proposal Review Fee ..... \$350.00

**Discharge Type** (check all that apply)

- Discharge of Recovered Ground Water
- Will the discharge be a result of dewatering only? .....  Yes     No
- Discharge that is part of an *In situ* Remediation
- Discharges other than those above (see instructions for more information)

**Facility Type** (check all that apply)

- Underground Injection Control (UIC) facility (i.e., any type of injection)
- Non-UIC (e.g., surface application) (see instructions for more information)

Attach a Discharge to Ground Water Proposal to this form (see instructions)

**SECTION C. PUBLIC NOTICE PROVISIONS** (Does not apply to residential heating oil tank cases)

Is the proposed discharge lasting greater than 180 days? .....  Yes     No  
 If "Yes," attach a copy of the public notice written as you intend it to be published. (see instructions)

**SECTION D. SITE USE AND GROUND WATER CLASSIFICATION**

**Current Site Use** (check all that apply)

- Industrial
- Residential
- Commercial
- School or child care
- Other \_\_\_\_\_
- Agricultural
- Park or recreational use
- Vacant
- Government

**Intended Future Site Use** (check all that apply)

- Industrial
- Residential
- Commercial
- School or child care
- Park or recreational use
- Vacant
- Government
- Future site use unknown

What is the ground water classification for this site as per N.J.A.C. 7:9C? (check all that apply)

- Class I-A
- Class I-PL Pinelands Protection Area
- Class I-PL Pinelands Preservation Area
- Class II-A
- Class III-A
- Class III-B



**SECTION E. RECEPTOR EVALUATION SUMMARY**

**Non-UHOT Cases**

1. Have any of the following been identified on the site or within 200 feet of the site boundary?

Check all that apply.

- Residences
- Public and private schools (K-12)
- Other occupied buildings
- Child care facilities
- Surface water
- Public parks and playgrounds

2. Did the well search conducted as a part of the receptor evaluation show any well use (potable, industrial, or irrigation)?..... Yes  No

If "Yes," indicate the type of use and approximate distance (closest occurrence) from site: (Check all that apply)

- Potable Distance from site: \_\_\_\_\_ feet
- Industrial Distance from site: \_\_\_\_\_ feet
- Irrigation Distance from site: \_\_\_\_\_ feet

3. Have any of these receptors been impacted? ..... Yes  No

If "Yes," Do you have an NJDEP assigned Case Manager? ..... Yes  No

If "Yes," please list the Case Manager: \_\_\_\_\_

**UHOT Cases**

1. Is ground water contamination above the Ground Water Remediation Standards? ..... Yes  No  
If "Yes," answer questions 2 and 3.

2. Has a potable well been identified within 100 feet of the contamination? ..... Yes  No

3. Have any potable wells been impacted? ..... Yes  No

If "Yes," has the NJDEP been notified? ..... Yes  No

**SECTION F. PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION**

Full Legal Name of the Person Responsible for Conducting the Remediation: Beazer East, Inc. c/o Three Rivers Manage

Representative First Name: Michael Representative Last Name: Slenska

Title: Senior Environmental Manager

Telephone Number: (412) 208-8867 Ext.: \_\_\_\_\_ FAX: \_\_\_\_\_

Mailing Address: 1910 Cochran Road, Manor Oak One - Suite 200

City/Town: Pittsburgh State: PA Zip Code: 15220

Email Address: mike.slenska@trmi.biz

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

*I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name/Title: Michael Slensak, Senior Environmental Manager

Check this box if the person above is also the property owner of the site or their representative. If this person is not the site property owner, please ensure the site property owner's name and address is included in the DGW Proposal, and also indicate that the property owner has been informed about the proposed discharge.

**SECTION G. LICENSED SITE REMEDIATION PROFESSIONAL INFORMATION AND STATEMENT**

LSRP ID Number: 577508  
First Name: John Last Name: Bolan  
Phone Number: (732) 584-0286 Ext: \_\_\_\_\_ Fax: (732) 271-4890  
Mailing Address: 67B Mountain Boulevard Extension  
City/Town: Township of Warren State: New Jersey Zip Code: 07059  
Email Address: jbolan@psands.com

This statement shall be signed by the LSRP who is submitting this notification in accordance with N.J.S.A. 58:10C-14, and N.J.S.A. 58:10B-1.3b(1) and (2).

*I certify that I am a Licensed Site Remediation Professional authorized pursuant to N.J.S.A. 58:10C to conduct business in New Jersey. As the Licensed Site Remediation Professional of record for this remediation, I:*

**[SELECT ONE OR BOTH OF THE FOLLOWING AS APPLICABLE]:**

- directly oversaw and supervised all of the referenced remediation, and/or*
- personally reviewed and accepted all of the referenced remediation presented herein.*

*I believe that the information contained herein, and including all attached documents, is true, accurate and complete.*

*It is my independent professional judgment and opinion that the remediation conducted at this site, as reflected in this submission to the Department, conforms to, and is consistent with, the remediation requirements in N.J.S.A. 58:10C-14.*

*My conduct and decisions in this matter were made upon the exercise of reasonable care and diligence, and by applying the knowledge and skill ordinarily exercised by licensed site remediation professionals practicing in good standing, in accordance with N.J.S.A. 58:10C-16, in the State of New Jersey at the time I performed these professional services.*

*I am aware pursuant to N.J.S.A. 58:10C-17 that for purposely, knowingly or recklessly submitting false statement, representation or certification in any document or information submitted to the board or Department, etc., that there are significant civil, administrative and criminal penalties, including license revocation or suspension, fines and being punished by imprisonment for conviction of a crime of the third degree.*

LSRP Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
LSRP Name/Title: John T. Bolan, Senior Associate  
Company Name: Paulus, Sokolowski and Sartor, LLC

Completed forms should be sent to:

Bureau of Case Assignment & Initial Notice  
Site Remediation Program  
NJ Department of Environmental Protection  
401-05H  
PO Box 420  
Trenton, NJ 08625-0420

**SECTION G. SUBSURFACE EVALUATOR UST REPORT CERTIFICATION FORM**

*I certify under penalty of law that the work was performed under my oversight and I have reviewed the report and all attached documents, and the submitted information is true, accurate and complete in accordance with the requirements of N.J.A.C. 7:14B and N.J.A.C. 7:26E. I am aware that there are significant civil and criminal penalties for submitting false, inaccurate or incomplete information including fines and/or imprisonment.*

Name: _____	UST Cert. No.: _____
Firm: _____	Firm's UST Cert. Number: _____
Firm Address: _____	
City/Town: _____	State: _____ Zip Code: _____
Phone Number: _____	Ext: _____ Fax: _____
Signature: _____	Date: _____

Completed forms should be sent to:

Bureau of Case Assignment & Initial Notice  
Site Remediation Program  
NJ Department of Environmental Protection  
401-05H  
PO Box 420  
Trenton, NJ 08625-0420

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**ATTACHMENT B**  
*Safety Data Sheets*

# Safety Data Sheet

Issue Date: 01-Jan-2006

Revision Date: 24-Nov-2014

Version Number: 1

## 1. Identification

### Product Identifiers

**Product Name:** Red Tracing Dye Tablet

**Product Number:** 101503

### Recommended Use & Restrictions on Use

Water tracing & leak detection dye

### Manufacturer/Supplier

Cole Parmer  
625 E. Bunker Ct.  
Vernon Hills, IL 60061  
U.S.A.

### Emergency Telephone Number

**Company Telephone Number:** (800) 323-4340

**Emergency Telephone (24 hr):** INFOTRAC (800) 535-5053 (North America)  
+1-352-323-3500 (International)

## 2. Hazards Identification

### Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

## 3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

## 4. First-Aid Measures

### First-Aid Measures

<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.
<b>Skin Contact</b>	Wash thoroughly with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.
<b>Inhalation</b>	Remove to fresh air. If breathing is difficult, administer oxygen; seek medical attention immediately.

**Ingestion** Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention if large quantities were ingested or if nausea occurs.

#### **Most Important Symptoms and Effects**

**Symptoms** Will cause staining of the skin on contact. May cause eye irritation. Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a red color until the dye has been washed through the system.

#### **Indication of Any Immediate Medical Attention and Special Treatment Needed**

**Notes to Physician** Treat symptomatically.

### **5. Fire-Fighting Measures**

#### **Suitable Extinguishing Media**

Water spray (fog). Carbon dioxide (CO<sub>2</sub>). Dry chemical.

#### **Unsuitable Extinguishing Media**

Not determined

#### **Specific Hazards Arising from the Chemical**

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NO<sub>x</sub>).

#### **Protective Equipment and Precautions for Firefighters**

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### **6. Accidental Release Measures**

#### **Personal Precautions, Protective Equipment and Emergency Procedures**

**Personal Precautions** Use personal protective equipment as recommended in Section 8.

**Environmental Precautions** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12 and Section 13.

#### **Methods and Material for Containment and Cleaning Up**

**Methods for Containment** Prevent further leakage or spillage if safe to do so.

**Methods for Cleaning Up** Sweep up and collect into suitable containers for disposal. Flush area with water.

### **7. Handling and Storage**

#### **Precautions for Safe Handling**

**Advice on Safe Handling** Handle in accordance with good industrial hygiene and safety practices. Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing should not be allowed out of the workplace.

**Conditions for Safe Storage, Including Incompatibilities**

<b>Storage Conditions</b>	Keep container tightly closed and store in a cool, dry, and well-ventilated area. Store away from heat, sparks, open flame or any other ignition source.
<b>Incompatible Materials</b>	Strong acids, bases, and oxidizing agents.

**8. Exposure Controls / Personal Protection****Exposure Guidelines**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

**Engineering Controls**

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

**Individual Protection Measures, Such as Personal Protective Equipment:**

<b>Eye/Face Protection</b>	Avoid contact with eyes.
<b>Skin &amp; Body Protection</b>	Rubber gloves. Suitable protective clothing.
<b>Respiratory Protection</b>	Use NIOSH-approved dust mask if dusty conditions exist.
<b>Hygiene Measures</b>	Handle in accordance with good industrial hygiene and safety practices.

**9. Physical and Chemical Properties****Information on Basic Physical and Chemical Properties**

<b>Physical State</b>	Solid	<b>Odor</b>	None apparent
<b>Appearance</b>	Dark red tablet	<b>Odor Threshold</b>	Not determined
<b>Color</b>	Dark red		

<b><u>Property</u></b>	<b><u>Values</u></b>
<b>pH</b>	Not applicable
<b>Melting/Freezing Point</b>	Not applicable
<b>Boiling Point/Range</b>	Not applicable
<b>Flash Point</b>	Not applicable
<b>Evaporation Rate</b>	Not applicable
<b>Flammability (solid, gas)</b>	Not flammable
<b>Upper Flammability Limits</b>	Not applicable
<b>Lower Flammability Limits</b>	Not applicable
<b>Vapor Pressure</b>	Not applicable
<b>Vapor Density</b>	Not applicable
<b>Relative Density</b>	Not applicable
<b>Specific Gravity</b>	Not applicable
<b>Solubility</b>	Highly soluble in water with small amounts of insoluble residue
<b>Partition Coefficient</b>	Not determined
<b>Auto-ignition Temperature</b>	Not determined
<b>Decomposition Temperature</b>	Not determined
<b>Viscosity</b>	Not determined

**10. Stability and Reactivity****Reactivity**

Not reactive under normal conditions.

**Chemical Stability**

Stable under recommended storage conditions.

**Possibility of Hazardous Reactions**

None under normal processing.

**Conditions to Avoid**

Keep separated from incompatible substances. Keep out of reach of children.

**Incompatible Materials**

Strong acids, bases, and oxidizing agents.

**Hazardous Decomposition Products**

Oxides of carbon and nitrogen (NO<sub>x</sub>).

**11: Toxicological Information****Information on Likely Routes of Exposure**

<b>Inhalation</b>	Avoid inhalation of dust.
<b>Ingestion</b>	Do not ingest.
<b>Skin Contact</b>	May cause an allergic skin reaction.
<b>Eye Contact</b>	Avoid contact with eyes.

**Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure**

May cause an allergic skin reaction.

**Numerical Measures of Toxicity**

Not determined

**Symptoms Associated with Exposure**

See Section 4 of this SDS for symptoms.

**Carcinogenicity**

<b>NTP</b>	None
<b>IARC</b>	None
<b>OSHA</b>	None



**12. Ecological Information****Ecotoxicity**

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Component Information**

Not available

**Persistence/Degradability**

This product is biodegradable.

**Bioaccumulation**

Not determined

**Mobility**

Not determined

**Other Adverse Effects**

Not determined

**13. Disposal Considerations****Waste Disposal Methods**

Dispose of in accordance with federal, state, and local regulations.

**Contaminated Packaging**

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

**14. Transport Information****Note**

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

<b>DOT</b>	Not regulated
<b>IATA</b>	Not regulated
<b>OMDG</b>	Not regulated

**15: Regulatory Information****International Inventories**

Not determined

**U.S. Federal Regulations**

<b>CERCLA</b>	This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).
---------------	--

**SARA 313** Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**CWA (Clean Water Act)** This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

#### U.S. State Regulations

**California Proposition 65** This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know** This product does not contain any substances regulated under applicable state right-to-know regulations.

### 16: Other Information

#### HMIS

Health Hazards	Flammability	Instability	Special Hazards
1	0	0	Not determined

#### NFPA

Health Hazards	Flammability	Physical Hazards	Personal Protection
1	0	0	B

<b>Issue Date</b>	01-Jan-2006
<b>Revision Date</b>	24-Nov-2014
<b>Revision Note</b>	New format

#### Disclaimer

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**End of Safety Data Sheet**

## Corporate Office Locations

### Alaska Office

- Anchorage

### Arizona Office

- Phoenix

### Florida Office

- Orlando

### Louisiana Office

- Baton Rouge

### Virginia Office

- Newport News

### Corporate Headquarters

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