17.0 Hazardous Materials

A. INTRODUCTION

This chapter assesses the potential for the Proposed Action to result in short-term hazardous materials exposure during construction and long-term exposure following completion. The descriptions and analyses contained herein are based on previously conducted hazardous material investigations prepared to identify conditions at the northern and southern portions of the Project Site, as discussed in detail in Section C. Review of these investigations indicates that previous remedial efforts at the Project Site have resulted in the removal of petroleum product and petroleum- and lead-contaminated soil and groundwater, but that the Project Site continues to contain residual soil and groundwater contaminated with volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals and petroleum hydrocarbons, as a consequence of past uses of the Project Site. Consequently, the Restrictive Declaration has been structured to place additional controls on site development. The Restrictive Declaration would be used to ensure that further investigation, if necessary, and remediation where necessary, would be performed. Consequently there is a potential for significant impacts related to exposure to contaminated soils. These potential impacts would be mitigated by the Applicant through the completion of site investigations and remediation of on-site contamination, if necessary. The Applicant will file a Restrictive Declaration to ensure this occurs. The Restrictive Declaration would require that the fee owner of a so-regulated lot conduct a testing and sampling protocol, and remediate where appropriate, to the satisfaction of NYCDEP before issuance of a building permit by the Department of Buildings. The Restrictive Declaration would include mandatory construction-related health and safety plans, which must be approved by NYCDEP. This mechanism precludes the potential that significant adverse impacts would result from the Proposed Action.

Appropriate Project Site investigations would be conducted prior to construction of the Project to more fully characterize contaminated soil, soil gas, and groundwater on the Project Site. To avoid any significant adverse impacts to human health or the environment, the investigation, Project construction (including excavation and soil removal), and any necessary remediation activities would be conducted in accordance with applicable laws and regulations. No soil disturbance would occur without NYCDEP's written authorization. Specifically, the applicant would take the following actions, which are defined in further detail in subsequent sections:

- A detailed investigative work plan summarizing the proposed soil, soil gas and groundwater sampling activities would be submitted to NYCDEP for review and approval prior to implementation.
- A site-specific Health and Safety Plan (HASP) that specifies the detailed measures to be taken to protect both project workers and the public during the construction phase would be submitted to NYCDEP for review and approval. The provisions of the HASP would be mandatory for contractors and subcontractors engaged in activities at the Project Site.
- Any on-site Above Ground Storage Tanks (ASTs) or Underground Storage Tanks (USTs) would be properly closed and removed in accordance with all applicable Federal, State and local guidelines.
- All open NYSDEC spill numbers would be closed prior to the start of construction or in accordance with a NYSDEC approved closure plan. NYCDEP would be provided with copies of

all correspondence with NYSDEC including any requests for additional investigative or remedial measures.

- Any petroleum impacted soil (which display petroleum odors and/or staining) encountered during the excavation or grading activities would be removed and properly disposed in accordance with all NYSDEC Regulations.

In summary, all investigative and remedial work plans and HASPs would be reviewed and approved by NYCDEP prior to starting any soil disturbance. As a result of the measures outlined above, the Proposed Action would not have any significant adverse impacts associated with hazardous materials.

B. LAND USE HISTORY OF THE PROJECT SITE AND ITS ENVIRONS

The Project Site is located between the East River and the west side of Vernon Boulevard, and between the Queensboro Bridge and a mapped but fenced-off segment of 43rd Avenue. The Project Site comprises Block 477, Lots 13, 15, 20, and 24 and can be described as comprising a northern portion and a southern portion. The northern portion of the Project Site is defined by Block 477, Lots 13, 15, and 20, (4202 and 4216-4218 Vernon Boulevard); the southern portion of the Project Site is defined by Block 477, Lot 24 (4220, 4242, and 4248 Vernon Boulevard). A Project Site Layout Map depicting the two portions over a satellite photo is included as Figure 17-1.

Provided in this section is a brief description of the uses on each portion of the Project Site over approximately the last century. Historically (and currently), the northern and southern portions of the Project Site have been independently owned, and therefore hazardous materials investigations for which reports are available were completed separately for each portion. For this reason, the historic uses of each portion are described separately. These descriptions are followed by a brief overview of the land use history of the site environs.

1. Northern Portion of the Project Site

Historical Sanborn Fire Insurance maps indicate that the Project Site was occupied by the New York Architectural Terra Cotta Company facility from before 1898 to some time after 1915. In 1932, the New York Architectural Terra Cotta Company went bankrupt, at which time it was taken over by the Eastern Terra Cotta Company. In 1947, Sanborn maps show that the Eastern Terra Cotta Company no longer existed and a part of the northern portion was being used for undefined plastics products manufacturing and electronics operations. By 1970, Sanborn Maps labeled parts of the northern portion as a warehouse, with one building labeled as "electronics." A Pepsi Cola Company facility occupied the northern portion to circa 1980. The 1990 and subsequent Sanborn maps show the northern portion as clear (i.e., absence of structures), with the exception of one small building on the eastern end of the site, the New York Architectural Terra Cotta Company building at 4210–4216 Vernon Boulevard. The northern portion is now vacant with the exception of that building, which is also not in use. Historic use of the northern portion may have contaminated soil, soil gas and groundwater with petroleum products, solvents, metals, polychlorinated biphenyls (PCBs), pesticides and herbicides.

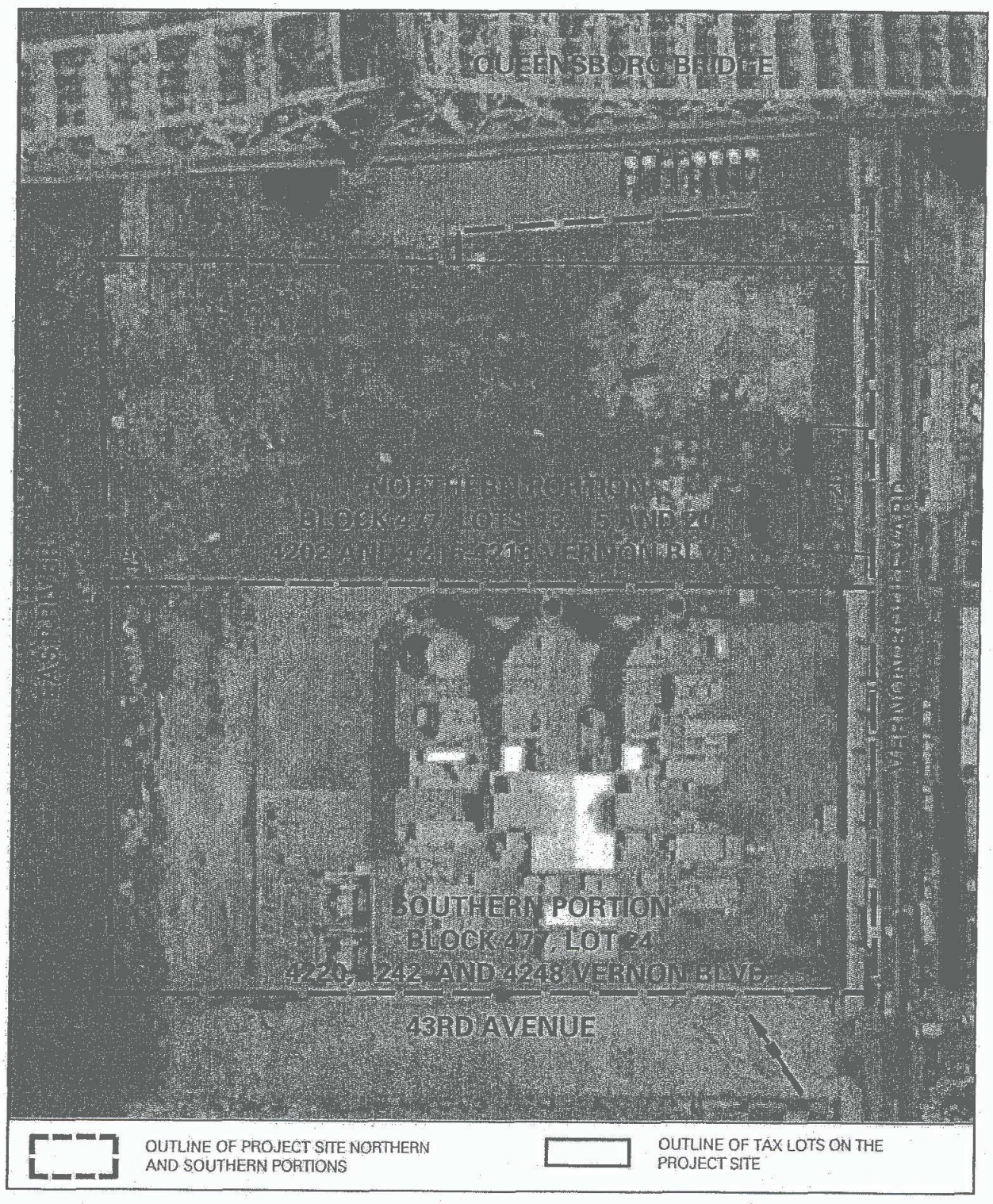


Figure 17-1:
Aerial View of Project Site

2. Southern Portion of the Project Site

Some time after 1915 but before 1936, the part of the terra cotta works on the southern portion of the Project Site was replaced by a fuel oil storage and distribution center operated by First National Oil Corporation. The 1950 Sanborn map shows the fuel oil storage and distribution facility as by that time operated by the Royal Petroleum Corporation. The facility included several petroleum storage tanks with a combined capacity of approximately 4.1 million gallons. According to a Site Summary Report of the former Royal Petroleum Terminal issued by Arcadis Geraghty & Miller (AGM) on May 12, 2000, the facility served primarily as a distribution center for home heating oil. The New York Power Authority (NYPA) constructed a temporary power facility on the southern portion in 2002, and the DSNY located an open salt storage pile on the southern boundary of the Project Site on the mapped but opened portion of 43rd Avenue west of Vernon Boulevard. Both of these last uses are still in operation. Current and historic use of the southern portion may have contaminated the soil, soil gas and groundwater with petroleum products, solvents, metals, polychlorinated biphenyls (PCBs), pesticides and herbicides.

3. Project Site Environs

During the majority of the 19th Century, the area east of the Project Site was sparsely developed with residential uses. These uses were replaced during the first half of the 20th Century by commercial and manufacturing uses, including a varnish works immediately east of the Project Site. The area immediately to the east of the Project Site was the site of four oil tanks, several unidentified tanks, mixing rooms, and a laboratory. The varnish works was replaced by an ice cream manufacturing company sometime between 1936 and 1947. Other uses on this block, for which the dates of operation are unknown, included a brass and plumbing foundry and a parking lot. The Queensboro Bridge opened in 1909 and is located immediately to the north of the Project Site. A Consolidated Edison training facility is located immediately to the south of the Project Site.

C. GEOLOGY AND HYDROGEOLOGY

The Project Site slopes gradually downwards from the east to the west towards the East River. The northern portion slopes from a high point of ±el 18[1] on the east side to ±el 6 at the top of the bank at the river's edge. The southern portion slopes from a high point of ±el 16 on the east side to ±el 8 at the top of the bank at the river's edge. The generalized stratigraphy underlying the project site is composed of a surficial layer of fill overlying a natural sand deposit followed by gneiss bedrock. Generally, the bedrock is higher on the west side of the Subject Site.

Specifically, surface soil is a fill layer comprised of a brown, fine to medium sand layer containing some silt, gravel, brick, concrete, wood, metal, and ash about 10 feet thick on the eastern side to about six feet thick on the western side. A brown, fine to medium natural sand deposit containing some silt and fine gravel is located below the fill. The sand layer is about six feet thick on the eastern side and increases to about 23 feet thick on the western side. Two to five feet of highly weathered to decomposed rock is present below the natural sand deposit. The gneiss rock has weathered into a grayish-brown coarse sand with cobbles, gravel, silt, and mica. Gneiss bedrock underlies the surficial fill and natural sand. The depth to competent rock ranges from about 14 feet below grade surface (bgs) on the east side to about 36 feet bgs on the west side. Groundwater on the northern portion ranges from 6 to 15 feet bgs, depending on the grade elevation.

[1] All elevations are presented in the datum in use by the Borough President's Office of the Borough of Queens (2.725 feet above mean sea level at Sandy Hook, New Jersey.)

The natural (prior to any historic development) Project Site shoreline along the East River was approximately 100 feet landward of the present river bank. Before the 1940s, the bank consisted of river sediment overlying bedrock. The natural river escarpment, which was about 6 feet high, cut into the bedrock, which was covered by a thin layer of soil. Based on the limited area of saturated unconsolidated material on the western half of the Project Site, and historic water-level measurements at the Project Site, groundwater flow is believed to be generally from east to west, becoming increasingly stagnant as it approaches the zone affected by tidal fluctuations.

Stormwater runoff from the Project Site that does not reach the New York City sewer system percolates through the potentially contaminated soils of the Site, into the East River.

D. EXISTING CONDITIONS

The existing soil and groundwater conditions on both the northern and southern portions of the Project Site have been the focus of numerous investigations. This section provides a list of the known previous environmental documentation (i.e., investigation and remedial action reports, and regulatory communications), summaries of the documents that have been obtained for review thus far, and a summary of both the northern and southern portions. Note that copies of all the listed reports have not been obtained and the effort to collect copies of all relevant reports is ongoing. The discussion of the listed items is divided and addressed by their applicability to either the northern or southern portion of the Subject Site.

1. Northern Portion

a) Previous Environmental Documentation

The following is a chronological list of previous environmental reports relating to the northern portion of the Subject Site. Copies of the reports are included as Appendix A. Figure 17-2 shows the approximate locations of former uses, site structures and remedial actions described in the reports summarized herein. Investigation sample locations are not shown on Figure 17-2 because of the extensive quantity of locations, but can be referenced in the appended reports.

- ***Environmental Liabilities Assessment for 4198 and 4202 through 4216 Vernon Boulevard.* Roy F. Weston, Inc. on behalf of Citibank. May 1994.:** Roy F. Weston, Inc. generated this report based on document review and two site inspections conducted on February 18, 1994 and April 8, 1994. The report reviewed and documented prior uses, petroleum use, storage tanks, hazardous waste storage, spills or releases, surface water and groundwater, fill and land disposal, enforcement and litigation, contamination, asbestos, indoor air quality, and provided conclusions and recommendations based on an analysis of the data. Relevant findings and conclusions included the following:
  - A vacant building exists on the northern portion that is estimated to be approximately 100 years old. The building was observed to be in poor condition and potentially structurally unstable. (This is the New York Architectural Terra Cotta Company building.)

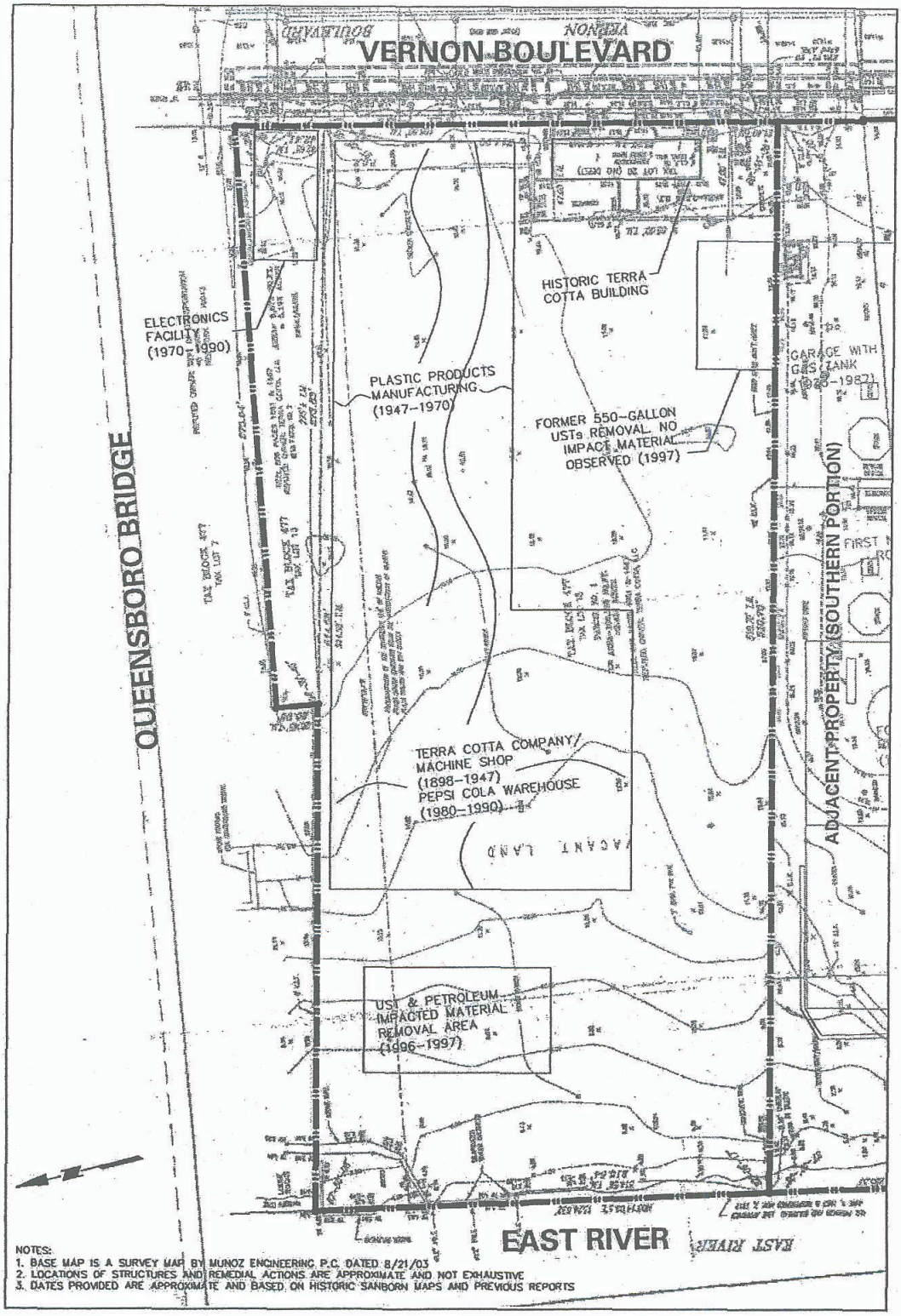


Figure 17-2:
Former Uses on Northern Portion of Project Site

- Soil and groundwater contamination is likely present as a result of historic operations and spills at the adjacent former Royal Petroleum Company oil terminal (on the southern portion). An NYSDEC file review found that the facility contained an 80,000 barrel tank with four compartments, including two compartments containing 2,015,290 gallons of No. 2 fuel oil, a 385,429-gallon No.2 diesel fuel compartment, and a 572,451-gallon No. 6 fuel oil compartment. Approximately two-thirds of the tank was noted as being below ground. As a result of a three foot subsurface crack in a tank wall, observed in 1980, 41 monitoring wells and three recovery wells were installed on the northern portion and approximately 39 monitoring wells and one recovery well were installed on the southern portion. Between the three northern portion recovery wells and one southern portion recovery well, 1,200 gallons of spilled oil was recovered in 1980 and 1981. Groundwater monitoring in 1986 showed a presence of an oil film in some of the monitoring wells. Royal Petroleum ceased operations in 1986 or 1987, demolished the tanks, and engaged in remedial activities. An unreported quantity of contaminated soils was excavated and stockpiled on the southern portion in 1987 and 1988, and eventually disposed. Soil and groundwater contamination is likely to remain on the northern portion. Two wells believed to be past recovery wells were observed during site inspections in 1994.
- Piles of debris believed to include tires, bricks, metal and bottles were observed on the northern portion.
- A fill pipe and associated piping was observed in the northeast corner of the New York Architectural Terra Cotta Company building indicating a possible underground storage tank.
- Suspect asbestos containing materials (ACM) were observed in the building. Three samples of air cell pipe insulation taken from the building were found to contain 90 percent asbestos.
- Painted surfaces associated with the building were found to be in poor condition. Samples of paint within the building found lead levels of 0.75 to 37 percent.
- The report recommended that further subsurface soil and groundwater sampling be conducted to address the possibility of contamination on the northern portion migrating from the southern portion).

- ***Summary of Underground Storage Tank Closure Site Assessment – Terra Cotta Facility.*** **ERD Environmental, Inc. September 1996:** This report documents the closure of three adjacent USTs approximately three feet below grade in the northwestern section of the northern portion. Two of the USTs each had a capacity of 10,000-gallons, apparently stored No. 6 fuel oil, and were orientated parallel to the East River. The third UST had a capacity of 10,000 to 12,000 gallons, was vertically orientated, and located on the east side of the two other USTs. During the removal petroleum-contaminated soil and free product in the groundwater were observed. A spill was reported to the NYSDEC on June 7, 1995 (Spill No. 95-02890). This spill number was closed on March 25, 1999. In total, 723 cubic yards of contaminated materials, approximately 573 cubic yards of contaminated soil and 150 cubic yards of sawdust and sludge mixture (resulting from the free product cleanup), were removed and disposed.

  Full delineation of the contaminated soil was not completed because of complications due to the 1980 petroleum spill of approximately 2,400 gallons at the former Royal Petroleum Terminal on the southern portion. Endpoint soil samples were collected from the north, west and south sidewalls of the tank removal excavation. The samples contained SVOC and metals exceedances of the NYSDEC Technical and Administrative Guidance Manual 4046 (TAGM 4046) Recommended Soil Cleanup Objectives (RSCO's). Through gas chromatography fingerprinting of samples of the petroleum taken from the UST excavation, two types of petroleum were identified. One type was associated with the tanks removed and the other was attributed to

product migration from the southern portion. In light of the fingerprinting results, a meeting was held with the NYSDEC and the responsible party (RP) for the southern portion spill. It was decided that the RP would continue the investigation by installing test pits, delineating the contaminated area, sampling, and removing product where necessary.

- ***550-gallon Storage Tank Excavation Report.*** **ERD Environmental, Inc. September 1997:** This report documents the removal of two adjacent 550-gallon gasoline USTs on June 30, 1997. The USTs were located in the southeast section of the northern portion, to the southwest of the New York Architectural Terra Cotta Company building. Upon excavation, both tanks were found to be filled with concrete and within a concrete vault. No evidence of a petroleum release was observed. The removal of the tanks and concrete vault was completed on July 1, 1997. Endpoint samples were collected from the base and sidewalls of the excavation and submitted for laboratory analysis of the NYSDEC Spill Technology and Remediation Series (STARS) SVOC and VOC parameters. Results showed no exceedances of the NYSDEC STARS guidelines. The report considered the tanks properly closed with no further remedial action necessary.

- ***Underground Storage Tank Closure Additional Soil Removal Report.*** **ERD Environmental, Inc. September 1997:** This report provides an update of the remedial activities performed in response to the contaminated soil and groundwater observed during the closure of the three USTs in the northwest section of the northern portion. The initial closure activities for the tanks are documented in the September 1996 Closure Site Assessment report previously summarized. Since September 1996, activities have included the delineation and remediation of soil contaminated by the three previously removed tanks (two 10,000-gallon USTs and one 10,000- to 12,000-gallon UST). Between July 1, 1997 and August 2, 2005, the previous tank removal excavation, which was 7 feet deep, 25 feet wide and 37 feet long, was over-excavated on all sidewalls to 7 feet deep, 60 feet wide and 60 feet long. The total quantity of petroleum-contaminated soil removed from the site was 558 tons.

  Soil and groundwater endpoint samples were collected on the bottom and sides of the final excavation. The report stated that NYSDEC STARS regulatory guidelines were met at the limits of the current excavation. Based on the sample results and observations of the excavation, the report concluded that no additional soil removal was required in the vicinity of the excavation and recommended that the NYSDEC issue a No Further Action designation for the location and NYSDEC Spill No. 95-02890. The spill number was closed by the NYSDEC on March 25, 1999.

- ***Phase I Environmental Site Assessment for 4198 and 4202 through 4216 Vernon Boulevard.*** **IVI Environmental, Inc. January 11, 1999:** The Phase I Environmental Site Assessment (Phase I) identified historic use of the northern portion as described above. The report recommended a soil and groundwater investigation to determine the potential for VOC, SVOC and metals contamination resulting from historic uses.

  The UST removals in 1995 (two 10,000-gallon UST and one 10,000- to 12,000-gallon UST) and 1997 (two adjacent 550-gallon gasoline USTs) were listed as a recognized environmental condition (REC). The report also mentioned an additional two 550-gallon gasoline USTs that were reportedly removed from the Project Site in 1995, but no other record has been found associated with these tanks and it is potentially a reporting error.

  The environmental database printouts appended to the report list two 15,000-gallon steel fuel oil USTs as active tanks on the northern portion.[2] The Phase I recommended that a geophysical survey be conducted to locate these and other potential USTs on the northern portion. The potential for a UST to be located beneath the New York Architectural Terra Cotta building was also indicated, based on field observations of vent and fill pipes near the building.

[2] The report erroneously identified one 15,000- and one 30,000-gallon steel fuel oil USTs.

The historic petroleum release on the southern portion was identified as a REC. The NYSDEC case manager, Chris Tomasello was contacted to determine the status of the spill and the potential for contamination on the northern portion. Mr. Tomasello stated that the spill was not closed and additional remediation was required on both the northern and southern portions. Mr. Tomasello also stated that a remedial action work plan has been developed by both the northern and southern portion property owners. The Phase I recommended a review of the NYSDEC files pertaining to the historic spill.

The Phase I reported that it appears fill has been imported onto the site to fill in low areas and wetlands, based on the site's variations in topography and site observations. The Phase I recommended that the fill be "screened" for contaminants. The Phase I also noted that because of the site's proximity to the Queensboro Bridge, there is the potential that soil on the site may have been contaminated by lead-based paint peeling or flaking from the bridge, or that lead-based paint may have been deposited on-site during bridge sanding operations. As a consequence, the Phase I recommended that site soils be sampled for lead.

The report referenced the Environmental Liabilities Assessment completed in 1994, which indicated that ACM may be present in building materials of the New York Architectural Terra Cotta Company building, and that the building contains lead-based paint. The Phase I recommended that activities that disturb the ACM be completed in accordance with all governmental requirements, and that all areas of lead-based paint in poor condition be abated, with the remaining lead-based paint managed in-place under an Operations and Maintenance Program.

- ***Phase II Environmental Site Assessment for Former Terra Cotta Company Property Located at 4198 and 4202 through 4216 Vernon Boulevard, Long Island City, New York.*** **IVI Environmental, Inc. August 9, 1999:** The Phase II Environmental Site Assessment (Phase II) details the work performed to investigate the findings of the Phase I dated January 11, 2005. The investigation was performed between July 20 and August 5, 1999 and included a geophysical survey, eight test pits, three groundwater samples, and an inspection of the New York Architectural Terra Cotta Company building.

  The geophysical survey was performed on all accessible parts of the site, which excluded an area near the Queensboro Bridge and areas with heavy vegetation. The Phase II concluded that no subsurface anomalies were discovered in the surveyed areas that could be USTs. A visual inspection of the New York Architectural Terra Cotta building found that previously observed vent and fill pipes had been cut and were not associated with tanks within the building. The completion of eight test pits found the following:

  - Petroleum contaminated material was observed in two test pits on the western side of the northern portion south of the 1995 UST removal. Petroleum contaminated material was observed at depths of 7 to 9 feet in the test pit closest to the UST removal area and at 11 feet in the test pit closer to the southern border of the northern portion. Analysis of soil samples from these test pits found no exceedance of the NYSDEC STARS parameters. Fingerprint analysis of the samples indicated that the petroleum was No. 4 or 6 fuel oil; similar to the sample results of material tested in the UST removal area. The report recommended that if future development required the excavation of the petroleum contaminated soil, the soil should be disposed as petroleum-contaminated waste.

  - The remaining test pits were located across the eastern half of the northern portion. Analysis of soil samples collected from these pits, sometimes shallow due to underground obstructions, found SVOC and metals exceedances of the NYSDEC TAGM 4046 RSCOs. The report concluded that the levels were typical of the fill in the area and recommended proper testing for waste characterization purposes if the soils were to be disturbed. The

report also recommended that the exceedances be reported to the NYSDEC. No record of this reporting was located.

Groundwater samples were collected from three existing wells: one in the western side of the northern portion, northeast of the New York Architectural Terra Cotta building (MW-1), and two in the southeast section of the northern portion (MW-2 and MW-3). MW-1 and MW-3 were found to contain metals exceedances of the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS). The metals exceedances were attributed to the fill constituents and a recommendation was made to report the exceedances to the NYSDEC. No record of this reporting was located.

The Phase II further recommended that development of the property be monitored to document the condition of any excavated soil and to ensure that suspect excavated soil in the areas identified above be handled in accordance with applicable USEPA and NYSDEC regulations and guidelines.

- ***Preliminary Geotechnical Report – Silvercup Studios West.*** **Langan Engineering & Environmental Services, PC. December 19, 2002:** The report details the soil and groundwater geotechnical conditions for the northern portion. The subsurface investigation included four test borings completed between December 2 and December 4, 2002. The investigation found the generalized stratigraphy underlying the project site to be composed of a surficial layer of fill overlying a natural sand deposit followed by gneiss bedrock. Specific soil and groundwater conditions were consistent with that reported in Section C of this chapter. During the field investigation, petroleum odors and soil staining were detected in three of the four borings located in the center and west half of the northern portion. Photionization Detector (PID) readings for petroleum-associated VOCs of 4 ppm to 80 ppm were recorded. The report recommended additional soil sampling and environmental testing to characterize the potential contamination.

b) Environmental Summary

The northern portion of the Subject Site has been the subject of several investigations since the petroleum spill was observed on the adjacent southern portion from the Former Royal Petroleum Company oil terminal in 1980. Since that time the following major environmental actions have occurred:

- Five USTs have been removed.
- A geophysical survey of the northern portion, excluding heavily vegetated areas and the side near the Queensboro Bridge, indicated that no other USTs remain on the site. However, the State environmental database shows two 15,000-gallon USTs on the northern portion that were not removed.
- The New York Architectural Terra Cotta building contains asbestos containing building materials and lead-based paint in poor condition.
- Between the three northern portion recovery wells and one southern portion recovery well, 1,200 gallons of spilled oil were recovered in 1980 and 1981.
- Approximately 1,800 tons of petroleum contaminated material has been removed from the northern portion.
- Numerous borings and groundwater wells have been completed on the northern portion. Several samples have shown soil and groundwater contaminated with petroleum, SVOCs and metals.
- One NYSDEC spill number is associated with the northern portion (95-02890). The spill number was closed on March 25, 1999.

2. Southern Portion

a) Previous Environmental Documentation

The following is a list of previous environmental reports and communications for the southern portion of the Project Site. Documents obtained and reviewed are indicated and included as Appendix B. Note that not all documents listed were available for review. Information from those that were reviewed but that are not summarized specifically is included in the Environmental Summary below. Figure 17-3 shows the approximate locations of former uses, site structures and remedial actions described in the reports summarized herein. Investigation sample locations are not shown on Figure 17-2 because of the extensive quantity of locations, but can be referenced in the appended reports.

- *Kerr-McGee Corporation Former Long Island City Terminal, 42-20 Vernon Boulevard, Queens, New York.* Leggette, Brashears & Graham, Inc. January 1994
- *Correspondence to Chris Tomasello (NYSDEC) from Gregory Ernst and John Wilson regarding a summary report of previous investigations at the Former Royal Petroleum Terminal, 42-20 Vernon Boulevard, Long Island City, New York.* NYSDEC Spill No. 93-09139. February 28, 1996.
- *Correspondence to Chris Tomasello (NYSDEC) from Gregory Ernst and John Wilson regarding interim remedial measures conducted at the Former Royal Petroleum Terminal, 42-20 Vernon Boulevard, Long Island City, New York.* NYSDEC Spill No. 93-09139. July 9, 1996.
- *Correspondence to Chris Tomasello (NYSDEC) from Gregory Ernst and Gregory Shkuda, PhD regarding groundwater characterization at the Former Royal Petroleum Terminal, 42-20 Vernon Boulevard, Long Island City, New York.* NYSDEC Spill No. 93-09139. January 21, 1997.
- *Risk Assessment Report, Former Royal Petroleum Site, 42-20 Vernon Boulevard, Long Island City, New York.* NYSDEC Spill No. 93-09139. July 22, 1997.
- *Remediation of Contaminated Soils, Royal Petroleum Company, Petroleum Products Terminal, Long Island City, New York.* Remediation Technologies, Inc. September 1988.
- *Product Recovery Trench Installation Report.* ARCADIS Geraghty & Miller. March 25, 1999.
- *Site Summary Report, Former Royal Petroleum Terminal, Long Island City, New York.* ARCADIS Geraghty & Miller, Inc. May 12, 2000
- *Phase II Subsurface Investigation, 42-30 Vernon Boulevard, Long Island City, New York.* Allee, King, Rosen & Fleming (AKRF). January 2001.
- *Geotechnical Investigation, Proposed New York Power Authority Generation Project, Vernon Boulevard Site, Queens, New York.* Jacques Whitford Engineering Group, Inc. January 17, 2001 (included in Appendix): This report details the soil and groundwater geotechnical conditions for the southern portion. The subsurface investigation included 12 test borings completed between December 27, 2000 and January 3, 2001. The investigation found the generalized stratigraphy underlying the project site to be composed of a surficial layer of fill overlying a natural sand deposit followed by gneiss bedrock. Specific soil and groundwater conditions were consistent with that reported in Section C of this chapter. During the field investigation, petroleum odors and soil staining were detected in five of the 12 borings. The borings with observed petroleum contamination were generally located in the northern half of the southern portion. Petroleum contamination was observed in a depth range of 0 to 13.5 feet bgs.
- *Correspondence to Richard Gardineer, P.E. (NYSDEC) from William Slade (NYPA) regarding Voluntary Cleanup Program Application, New York Power Authority In-City Generation Project, Vernon Boulevard Site, Long Island City, Queens.* February 19, 2001.

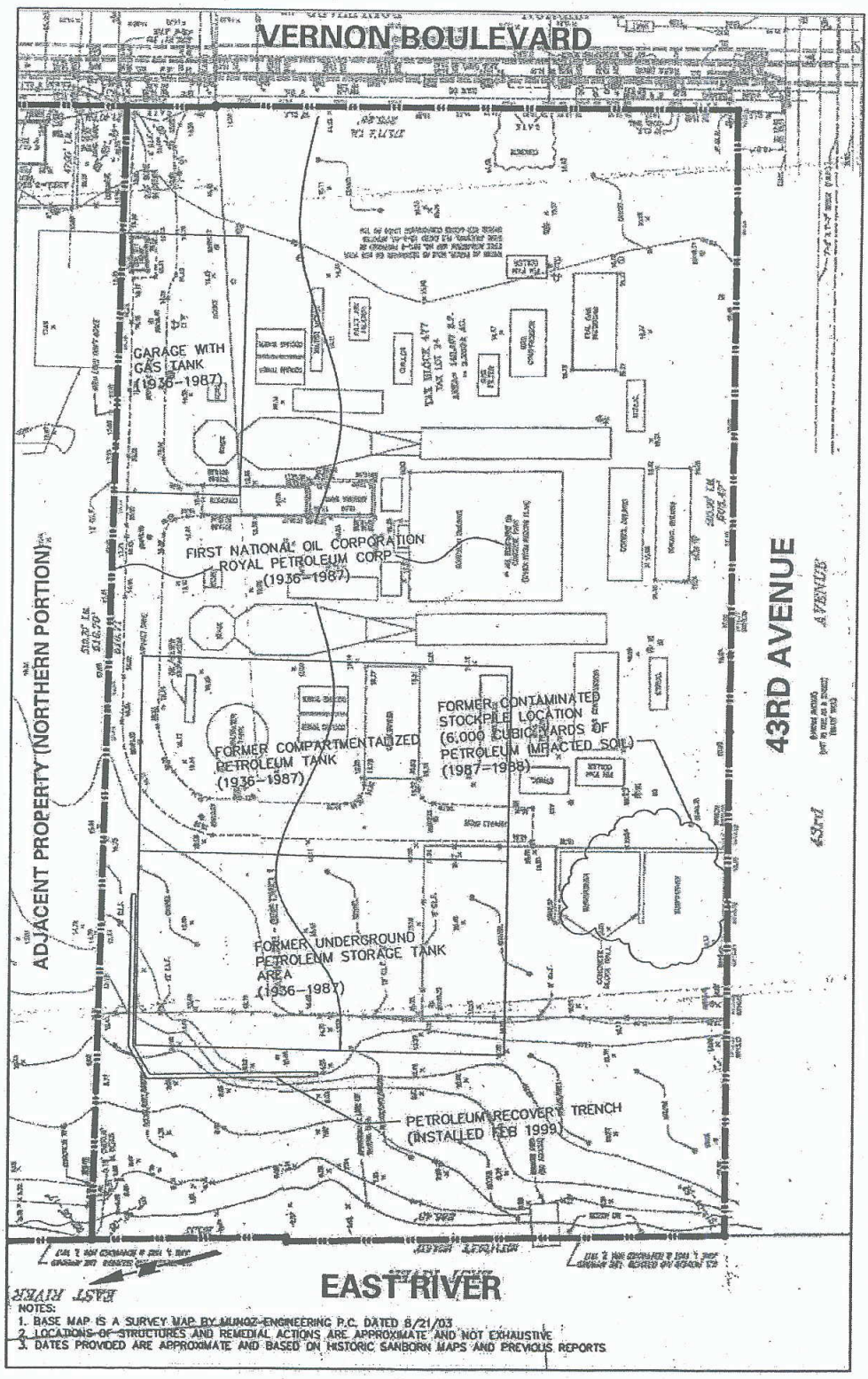


Figure 17-3:
Former Uses on Southern Portion of Project Site

- *Final Supplemental Environmental Impact Statement for the Vernon Boulevard Site.* AKRF for the NYPA. January 2002.
- *Site Investigation Work Plan, Vernon Boulevard Turbine Site, Long Island City, New York.* Gannett Fleming Engineers and Architects, P.C. Revised March 2003 (included in Appendix): The Site Investigation Work Plan (SIWP) proposing additional investigation of the southern portion was developed in response to the discovery of hazardous lead concentrations in the soil. In February 2001, stockpiled petroleum contaminated soil was sampled for hazardous concentrations prior to disposal. Three of the nine soil samples analyzed for Toxicity Characteristic Leaching Procedure (TCLP) exceeded the USEPA Maximum Concentration for the Toxicity Characteristic (hazardous level) for lead (5.0 milligrams per liter).The SIWP is a revised version that has been reviewed, with comments integrated, by Vadim Brevdo, P.E. of the NYSDEC. The SIWP details the southern portion history (as set forth in the Environmental Summary below), proposed site investigation techniques, and a schedule for the proposed investigation, and appends a Field Sampling Plan, a Quality Assurance Project Plan, and a HASP. The SIWP states that the petroleum contamination on the southern portion has been fully characterized based on previous investigations at the site.

  The SIWP proposes soil sampling from 11 borings throughout the site, and groundwater sampling from five new shallow monitoring wells. Two soil samples will be collected from each boring and analyzed for total and leachable concentrations of Target Analyte List (TAL) metals. Groundwater wells will be installed upgradient and downgradient and in the central portion of the site. One round of groundwater samples is proposed, with samples analyzed for Target Compound List (TCL) VOC, SVOC, pesticides, PCBs, and TAL metals.

b) Environmental Summary

On April 16, 1980, after a month of heavy precipitation, the United States Coast Guard (USGS) observed an oil slick on the East River along the bulkhead connected to the Project Site (both northern and southern portions). In response, approximately 92 wells were installed across the Project Site. A widespread accumulation of oil was found on the water table, with a maximum product thickness of 5 feet on the north side of the area used for the on-site storage of oil within the Royal Petroleum Terminal. As noted above, an inspection of the 80,000-barrel compartmentalized tank on the southern portion of the Project Site revealed a substantial crack on the north wall, approximately 3 feet below land surface. Three recovery wells were installed across the site, resulting in the recovery of approximately 1,200 gallons of product by the fall of 1980. Periodic pumping from these recovery and monitoring wells continued into late 1981, when recovery efforts ceased. Groundwater and product-thickness monitoring continued into 1986, at which time only a sheen of oil was observed in some wells.

In June 1987, the facility was closed, the oil storage tank systems were dismantled, and the facility was demolished by American Environmental Inc. (AEI). All tanks, including the 80,000-barrel compartmentalized tank, 26 "bullet" tanks (27,500-gallon each), and nine 300- to 1,000-gallon USTs were cleaned, purged or inerted, excavated, rendered unusable, and disposed in accordance with applicable regulations. Soils on the site were observed to be contaminated with hydrocarbons (petroleum). Based on the location of the contaminated soil, it was believed that the majority of the contamination resulted from operations at the facility rather than from a tank failure. However, contaminated soil was encountered during the removal of the concrete retaining wall on the north side of the 80,000-barrel compartmentalized tank, attributable to the crack discovered in 1980 in the tank's north wall. Contaminated soil not attributable to the crack in the tank wall was also discovered subsequent to the removal of the concrete retaining walls on the east and south sides of the compartmentalized tank. All contaminated soils excavated from around the compartmentalized tank

were stockpiled on-site and treated through the use of mechanical aeration and biodegradation techniques.

No contaminated soil was observed during excavation of the 26 "bullet" tanks or the nine small tanks. However, the foundations of these tanks were found to be approximately 4 feet above the foundation of the compartmentalized tank. As a consequence, six test excavations were dug by AEI in January 1988 four feet beneath the foundations of the 26 "bullet" tanks and nine small tanks. Several thin discontinuous zones of black coloration were observed in this soil. The black material consisted of a clayey sand and was slightly friable. It did not exude a petroleum odor, did not produce a sheen when mixed with water, did not appear to be contaminated with petroleum product, and, as a consequence, was left in place.

A hydrogeologic assessment of the site was completed in October 1993 by Leggette, Brashears & Graham, Inc. The assessment consisted of completing eight soil borings and installing two monitoring wells in the western half of the site in the former oil storage tank area, and hand auguring four shallow borings across the eastern half of the southern portion. The results of the assessment indicated that polynuclear aromatic hydrocarbons (PAHs) were detected at concentrations above the NYSDEC TAGM 4046 RSCOs.

A spill for the southern portion was reported to the NYSDEC in October 1993. NYSDEC Spill No. 93-09139 is listed as a gasoline spill resulting from a tank failure at a Major Facility (listed as less than 400,000-gallons). Groundwater is listed as an affected resource and the spill number remains open. It is not known whether this spill report resulted from the investigations described in the preceding paragraph.

In November 1995, an additional investigation was conducted by Geraghty & Miller to assess the potential impact of leaks from the former compartmentalized tank on undisturbed soils surrounding the tank. Ten soil borings were drilled along the north and east sides of the former storage tank area. Soil samples from the borings were analyzed for STARS VOCs and SVOCs, and total petroleum hydrocarbons (TPH). The investigation detected concentrations of SVOCs in the soils surrounding the northeast corner of the former compartmentalized tank. VOCs were also detected in one of the ten samples. It is unknown if the concentrations exceeded regulatory cleanup levels. The results indicated continued residual contamination of soil in this area.

In April 1996, an Interim Remedial Measures (IRM) program and limited soil and groundwater investigation was conducted by Geraghty & Miller to assess the presence of free product in the water table in areas where free product was previously observed during the 1980 and 1981 investigations and remedial efforts described above. The IRMs included excavation of 13 test pits across the southern and northern portions of the Project Site.

VOCs were detected in soil samples from three of the test pits, while SVOCs were detected in soil samples from eight of the test pits in concentrations above the NYSDEC STARS Memo No. 1 guidance values for protection of groundwater. Approximately one to two inches of free product were observed in one test pit.

VOCs were detected in groundwater samples from three test pits and SVOCs were detected in groundwater samples from eight test pits at concentrations above the NYSDEC TOGS 1.1.1 AWQS. These groundwater samples were not considered to be representative of actual groundwater quality due the high turbidity of the samples, as confirmed by a supplemental investigation in October 1996.

In July 1997, AGM completed a risk-based analysis of the southern portion to evaluate the potential risk to human health and the environment from potential exposure to residual constituent concentrations in the soil. Maximum detected concentrations from surface and subsurface soil samples were compared to USEPA Region 3 Residential Ingestion Preliminary Remedial Goal Values (PRGs-USEPA, 1996) to select constituents of concern (COC). Those constituents that had maximum concentrations greater than the screening PRGs were retained as COCs. Health-based goals (HBGs) were then calculated for each COC. AGM reported that none of the detected constituent concentrations exceeded the HBGs for the excavation work.

In February 1999, two product recovery trenches were installed by AGM in the vicinity of the former 26 "bullet" tanks and nine small tanks. One 85-foot long trench was installed parallel to the East River immediately west of the location of the former 26 "bullet" tanks and nine small tanks. A second, 150-foot long tank was installed perpendicular to the East River along the northern limit of the former compartmentalized tank and location of the former 26 "bullet" tanks and nine small tanks. Petroleum product resting on the surface of the underlying groundwater was collected from each trench. An accumulation of free product was observed within an approximately 10-foot length of the trench excavated perpendicular to the river. Approximately 500 gallons of oil and water were removed from this location. Product removal continued until July 1999 when product was no longer recoverable.

Two monitoring points were installed by AGM into the recovery trench to provide long-term monitoring and recovery of free product. The monitoring was conducted monthly until no measurable product was detected within the on-site monitoring wells, as stipulated by NYSDEC. The last recorded product (approximately 0.5 inches) was reported in July 1999 in the recovery trench.

AKRF, Inc. conducted a Phase II Subsurface Investigation in December 2000 to assess the soil and groundwater conditions in the southern portion. The Phase II investigation was completed for NYPA concurrently with development of the temporary NYPA facility now located on the southern portion. The Phase II included the collection of two soil samples from each of six soil borings for a total of twelve soil samples. Collection of groundwater samples was attempted at each boring location. However, due to soil/groundwater conditions at the site, only one groundwater sample was obtained. Soil and groundwater samples were analyzed for target compound list (TCL) of VOCs, and SVOCs, TCL of metals, polychlorinated biphenyls (PCBs), pesticides and herbicides, and total petroleum hydrocarbons (TPH).

A dark petroleum sheen was noted on the groundwater surface. PID readings from soil samples from boring locations on the western end of the southern portion ranged from none detected to 50.7 ppm. These two locations were within areas of the former fuel oil and gasoline tanks, as shown on Sanborn maps. No PID readings above background levels were detected in the soil in the remaining four central and eastern upgradient borings locations.

The analytical results of the twelve soil samples found no VOC exceedances of the NYSDEC TAGM 4046 RSCO. Benzene was detected at a concentration above the NYSDEC TOGS 1.1.1 AWQS in the groundwater sample. The analytical results showed levels of SVOCs, including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene and dibenzo(a,h)anthracene, that exceeded the NYSDEC TAGM 4046 RSCO at depths ranging from the surface to ten feet below grade.

Elevated levels of a number of SVOCs, including 2-methylnaphthalene, acenaphthene, fluorine, and phenanthrene, above the NYSDEC TOGS 1.1.1 AWQS were detected in the groundwater sample. No PCBs, pesticides, or herbicides were detected in the soil or groundwater samples. TPH was

detected in all soil samples at concentrations ranging from 29 mg/kg to 640 mg/kg. Through chromatographic laboratory methods, it was determined that No. 2 fuel oil was present in nine of the twelve soil samples, with higher concentrations detected in areas of the former fuel oil and gasoline tanks.

The results showed levels of iron, nickel and zinc above the NYSDEC TAGM 4046 RSCOs in all soil samples. Elevated levels of chromium above the RSCOs were detected in eleven of the twelve soil sampling locations, and elevated levels of copper above the RSCOs were detected in ten of the twelve soil sampling locations. Elevated levels of barium and lead above their respective RSCOs were detected at one soil sampling location. Elevated levels of aluminum, iron, manganese, sodium, and nickel were detected at levels above the NYSDEC TOGS 1.1.1 AWQS in the groundwater sample.

The elevated levels of metals detected throughout the site soils did not display any apparent pattern. The highest levels of SVOCs were detected in the western downgradient borings. These borings were located within the areas of the former fuel oil and gasoline tanks, as shown on historical Sanborn maps.

The elevated levels of benzene, fuel oil and SVOCs in the downgradient groundwater sample may indicate the presence of residual petroleum in the groundwater. However, no free product was detected during the Phase II Subsurface Investigation. The elevated levels of sodium in the groundwater may have been associated with the DSNY salt storage facility at the southern boundary of the site, or naturally-occurring tidal influences of the brackish waters of the East River.

Construction of the temporary NYPA facility was completed by 2002. During initial phases of construction, excavated soils were segregated based on the results of the pre-construction soil borings summarized above. Some of the excavated material was found to be contaminated with petroleum, while other excavated material was found to fail the TCLP for lead. As a consequence, approximately 6,000 tons of excavated material was managed as hazardous waste, and sent to a USEPA licensed disposal facility. According to the Environmental Impact Statement (EIS) prepared for the temporary NYPA facility, construction activities were conducted pursuant to a site-specific HASP that was intended to protect the health and safety of workers and the public.

In March 2003, NYPA submitted the revised SIWP to the NYSDEC. As summarized above, the SIWP proposes a site monitoring program, including installation of groundwater monitoring wells and soil sampling, to evaluate TAL metals levels in the southern portion's soils and TCL VOCs and SVOCs, TAL metals, pesticides, and PCBs in the southern portion's groundwater. The SIWP states that the petroleum-contaminated materials on the southern portion have been fully delineated.

E. FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION

In the future without the project, the temporary NYPA facility would vacate the site, and a new continuous bulkhead would re-establish the western edge of the entire Project Site. The SIWP would be implemented. In addition, renovation of the New York Architectural Terra Cotta building would be undertaken, along with any necessary removal of ACM and lead in accordance with applicable regulations and guidelines. Without the Proposed Action, contaminated soils and groundwater in the northern portion of the Project Site would be left in place. Stormwater would continue to percolate through the soils on the Project Site into the East River.

F. FUTURE CONDITIONS WITH THE PROPOSED ACTION

With the Proposed Action, substantial excavation would be undertaken on the Project Site in connection with the development of required foundations and the underground parking area, which would necessitate dewatering and removal of soil from the Project Site. Prior to excavation, additional soil and groundwater samples would be collected to characterize and define the methods used to properly handle and dispose of the material in accordance with applicable state and federal requirements.

Based on investigations and remedial actions taken to date, it is anticipated that the excavated material would include petroleum contaminated soil; non-hazardous urban fill and soil that exceeds the NYSDEC TAGM 4046 RSCOs and is suitable for disposal at an approved landfill; construction and demolition debris suitable for disposal at solid waste landfills; and hazardous waste.

Certain areas of the southern portion of the Project Site have not been fully investigated due to the presence of the temporary NYPA facility. Once the temporary facility is removed and its foundation demolished, additional site investigations would be undertaken.

It is anticipated that construction activities for the proposed Project would include site dewatering. As described in Chapter 19, "Construction Impacts," dewatering would take place within a confined space developed through the establishment of a "bath tub" using slurry wall or secant wall construction methods. This would substantially restrict or eliminate the flow of water from within the enclosed space. Water withdrawn from the site during dewatering activities would be analyzed to determine the presence of contaminants and treated as necessary to meet NYCDEP requirements prior to discharge into the municipal combined sewer system. This would eliminate the potential for release of contaminants into either the groundwater or East River.

All construction activities would be completed in accordance with a site-specific HASP, which would detail the procedures and methods to be implemented to protect the health and safety of workers and the general public. The HASP would include procedures for the safe handling of site soils and groundwater, including any water from dewatering activities.

Implementation of the HASP would be the principal means of protecting the workers and the public from exposure to contaminated materials during construction. Workers that have the potential to come in contact with contaminated materials would be required to read, understand and implement the procedures specified in the HASP. They would also be required to have specific training to assist them in identifying the presence of potential health and safety hazards. The HASP would require medical monitoring, and certification and training requirements for workers with the potential to encounter contaminated materials. These procedures would include health and safety guidelines and work practices to prevent exposure. The procedures would be developed through evaluation of the known and suspect contaminants and the work to be performed. Sampling and monitoring for the presence of contaminants would be included in the HASP and implemented in accordance with Occupational Health and Safety Administration (OSHA) regulations and guidelines.

If soil, groundwater or soil gas investigations to be conducted pursuant to work plans approved by NYCDEP, reveal the presence of VOCs, the necessity for soil gas mitigation systems (i.e., vapor barrier and sub-slab depressurization systems) would be evaluated. If warranted, vapor protection would be incorporated into the design of the structures. In addition, at the completion of the Proposed Action the entire Project Site would be covered with appropriate surfaces, to include asphalt, concrete, other paving materials, or certified clean fill material. Acceptable fill material would be characterized by the absence of an exceedance of the NYSDEC TAGM 4046 RSCOs. In

addition, stormwater runoff would be directed to the East River through the existing outfall at 43rd Avenue, thus limiting percolation of stormwater through potentially contaminated subsurface soils on the Project Site and reducing any contaminant leachate flow into the river.

The following specific actions would be taken by the Applicant to satisfy applicable regulatory requirements:

- A detailed investigative work plan summarizing the proposed soil, soil gas and groundwater sampling activities would be submitted to NYCDEP for review and approval prior to implementation. The work plan would include a site map depicting the proposed test boring locations. Soil samples and groundwater samples would be collected and analyzed by an NYSDOH ELAP certified laboratory for the presence of Target Compound List (TCL) organics (VOCs, SVOCs, Pesticides and PCBs) and Target Analyte List (TAL) metals. Soil gas samples would be analyzed for volatile organics (VO-15). No soil disturbance would occur without NYCDEP's written authorization.
- The HASP would be submitted to NYCDEP for review and approval. The provisions of the HASP would be mandatory for contractors and subcontractors engaged in activities at the Project Site.
- Any on-site ASTs or USTs would be properly closed and removed in accordance with all applicable Federal, State and local guidelines. Non-intrusive geophysical survey techniques such as an Electromagnetic Survey (EM) or Ground Penetrating Radar (GPR) would be used to identify suspected USTs. This would be detailed in the investigative work plan described in Item 1 above.
- All open NYSDEC spill numbers would be closed prior to the start of construction or in accordance with a NYSDEC approved closure plan. NYCDEP would be provided with copies of all correspondence with NYSDEC including any requests for additional investigative or remedial measures.
- Any petroleum contaminated soil (soil displaying petroleum odors and/or staining) encountered during the excavation or grading activities would be removed and properly disposed in accordance with all NYSDEC Regulations.

In summary, all investigative and remedial work plans and HASPs would be reviewed and approved by NYCDEP prior to starting any soil disturbance). Implementation of these measures would assure that the Proposed Action would not result in any significant adverse impacts due to exposure to hazardous materials.

It is anticipated that the bulkhead along the entire Project Site shoreline will be replaced as independent actions from the Proposed Action. However, reconstruction of the bulkhead along the southern portion of the Site is dependent on NYPA, the current occupant, obtaining necessary approvals to do so and undertaking the work. If these events do not occur, this portion of the bulkhead would be constructed as part of the Proposed Action, including placement of fill to reestablish the eroded shoreline. This work would also be covered in the HASP, and would not involve use or placement of any hazardous materials. Therefore there would be no significant adverse impacts related to hazardous materials resulting from reconstruction of the southern portion bulkhead.

G. VARIATIONS

There would be no difference between the Preferred Development Program and the three variations in terms of hazardous materials. The variations would be constructed within the same footprint and using the same construction techniques as the Preferred Development Program. As with the Preferred Development Program, a Restrictive Declaration would be filed, construction activities would occur in accordance with a HASP, and all soils and groundwater would be managed in accordance with applicable laws and regulations. As a consequence, like the Preferred Development Program, the variations would not result in any unmitigated significant adverse impacts related to hazardous materials.