

PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE

OF

**PROPOSED PUBLIC SCHOOL FACILITY (K15D)
4302-4310 FOURTH AVENUE AND 364 43RD STREET
BROOKLYN, NEW YORK 11232
BLOCK 728, LOTS 34 AND 36**

**SCA LLW NO. 104559
SCA CONTRACT NO. C000013429
SCA JOB NO. K15D-64628
SCHOOL DISTRICT: 15**

AKRF PROJECT NO. 89158

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1.0 EXECUTIVE SUMMARY

At the request of the Industrial and Environmental Hygiene (IEH) Division of the New York City School Construction Authority (NYCSCA), AKRF Engineering, P.C. (AKRF) conducted a Phase I Environmental Site Assessment (ESA) Update of the property located at 4302-4310 Fourth Avenue and 364 43rd Street in the Sunset Park neighborhood of Brooklyn, NY 11232 (hereafter referred to as the "Site"). The legal description of the Site is Block 728, Lots 34 and 36.

The Site consists of two adjacent lots: an approximately 10,000-square foot (SF) lot on the eastern portion of the Site (Lot 36) developed with a vacant, three-story building with a basement and an adjoining vacant two-story building with exterior landscaped areas; and an approximately 2,500-SF vacant lot on the western portion of the Site (Lot 34) used for surface parking. The NYCSCA is considering purchasing the Site for redevelopment and use as a public school facility. The Site is abutted to the north by 43rd Street, followed by former St. Michael's School (currently P.S. 516) and St. Michael's Church. The Site is abutted to the south by residential structures with street-level retail establishments, including restaurants and convenience stores. The Site is abutted to the west by residential structures. Fourth Avenue abuts the Site to the east, followed by residential structures (including a senior housing facility) with street-level retail establishments, including a deli and a hair salon, and a municipal/NYPD office building to the northeast.

The eastern Site lot (Lot 36) was vacant until the construction of the existing two- and three-story buildings between circa 1888 and 1906. The buildings were used historically as the 68th Precinct Police Station and adjoining jail cells until approximately 1970, and were most recently used as a Youth Center. The buildings were granted landmark status by the City of New York, and have been vacant since at least 1999. Both buildings are currently in disrepair and inaccessible for inspection. The western Site lot (Lot 34) was developed with a private dwelling from circa 1888 to 1970, and has been vacant and/or used for surface parking since at least 1976. NYCSCA is considering purchasing the Site for construction of a public school facility.

Phase I ESA and Phase II Environmental Site Investigation (ESI) were previously conducted by Langan Engineering and Environmental Services, P.C. (Langan) in April 2010 and July 2010, respectively. This Phase I ESA Update was completed to identify the potential presence of any new recognized environmental conditions (RECs) that may affect the suitability of the Site for use as a public school facility. RECs are defined in American Society of Testing and Materials (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or, (3) under conditions that pose a material threat of a future release to the environment. Note that controlled recognized environmental conditions (CRECs) are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA Update. Additionally, vapor encroachment conditions (VECs) were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA Update also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl (PCB) - containing light ballasts and caulking materials,

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exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA Update included a review of federal, state, and local records, previous reports (if available) and historical documents; visual observation of the Site and adjoining properties; and interviews with selected Site representatives.

The assessment requested by the NYCSCA is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site as a public school facility. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Phase I ESA Update included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and potential for methane generating materials.

Summary of RECs, VECs and Environmental Concerns

On-Site REC/VECs:

- Results of a 2010 Phase II Environmental Site Investigation which indicated elevated detections of TCE and PCE above the current NYSDOH AGVs.
- A suspect former fuel oil fill port located on the east-adjacent sidewalk on Fourth Avenue (Lot 36) which may have been associated with an on-site fuel oil storage tank.
- Potential former automotive repair activities associated with an automobile storage garage in the two-story building on Lot 36 (noted on 1926-1970 Sanborn Maps).
- Potential buried debris associated with demolition of historic on-site structures could include USTs and/or historic fill material of unknown origin.

Off-Site RECs/VECs:

- Two dry cleaners located on the south-adjacent block at 4402 Fourth Avenue and 4416 Fourth Avenue (also identified in the historic cleaners database). Potential releases of dry cleaning solvents from these facilities could have affected the Site subsurface.
- Various historic manufacturing and industrial uses on the surrounding properties, including: a printer (and subsequent sign shop and laundry) south of the Site at 4324 Fourth Avenue (1951-2007 Sanborn maps, 1945-1980 City Directories); a paper manufacturer (1906 Sanborn map) and lace and embroidery works/manufacturer (1926-1951 Sanborn maps) south of the Site at 366 44th Street; and a radio parts manufacturer east of the Site at 405 44th Street (1951 Sanborn map, also listed as a petroleum bulk storage facility in the regulatory database).
- Historical automotive uses on the east-adjacent block, including: a gasoline service station with four gasoline tanks at 4313-4323 Fourth Avenue (1926-1951 Sanborn maps); a cluster of 15 auto garages at 405-411 44th Street (1926 Sanborn map); and an automotive sales and service shop with a fuel tank at 423 44th Street (1951-2004 Sanborn maps).

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- Multiple industrial facilities, including Delloy Metals and Continental Cutter Supply in the 1945 City Directory, and Empire Tool Company in the 1949 City Directory, located south-adjacent to the Site at 4314 Fourth Avenue.

This Phase I ESA Update has revealed the following environmental concerns associated with the Site:

- Potential suspect ACM and LBP in the buildings and/or buried demolition debris.
- Potential PCB-containing electrical fixtures, light ballasts, and/or window caulking and/or buried demolition debris.

Recommendations

The RECs/VECs identified in this ESA are generally consistent with the findings of Langan's 2010 Phase I ESAs (no new RECs were identified). AKRF concludes that the RECs were adequately investigated during Langan's 2010 Phase II ESIs, with appropriate recommendations made for procedures to be implemented during redevelopment. Based on the findings of the Phase I ESA Update, no additional subsurface investigations are recommended at this time. AKRF agrees with the recommendations of the previous investigations, which included:

The installation of an active sub-slab depressurization system (SSDS) and soil vapor barrier; proper characterization, handling, and disposal of soil excavated during school construction; proper closure/removal of any underground or aboveground petroleum storage tanks (and any petroleum-contaminated soil) in accordance with applicable regulations; minimizing dewatering to prevent potential migration of contamination onto the site from off-site sources, and proper discharge of any dewatering fluids during construction; and, placement of a minimum of two feet of environmentally clean fill over exposed soil in landscaped areas within the Site. In addition, any suspect ACM, LBP, and PCB-containing materials should be properly managed during construction or renovation activities.

2.0 INTRODUCTION

At the request of the Industrial and Environmental Hygiene (IEH) Division of the New York City School Construction Authority (NYCSCA), AKRF Engineering, P.C. (AKRF) conducted a Phase I Environmental Site Assessment (ESA) Update of the property located at 4302-4310 Fourth Avenue and 364 43rd Street in the Sunset Park neighborhood of Brooklyn, NY 11232 (hereafter referred to as the "Site"). The legal description of the Site is Block 728, Lots 34 and 36.

The Site consists of two adjacent lots: an approximately 10,000-square foot (SF) lot on the eastern portion of the Site (Lot 36) developed with a vacant, three-story building with a basement and an adjoining vacant two-story building with exterior landscaped areas; and an approximately 2,500-SF vacant lot on the western portion of the Site (Lot 34) used for surface parking. The NYCSCA is considering purchasing the Site for redevelopment and use as a public school facility. The Site is abutted to the north by 43rd Street, followed by former St. Michael's School (currently P.S. 516) and St. Michael's Church. The Site is abutted to the south by residential structures with street-level retail establishments, including restaurants and convenience stores. The Site is abutted to the west by residential structures. Fourth Avenue abuts the Site to the east, followed by residential structures (including a senior housing facility) with street-level retail establishments, including a deli and a hair salon, and a municipal/NYPD office building to the northeast. Visual inspection of the Site and adjacent areas was performed on June 2, 2016 by Ms. Jennifer Pensky and Ms. Neoma Chefalo of AKRF, accompanied by Mr. Matthew Mankovich of the NYCSCA. At the time of inspection, the Site buildings were unsafe for entry and the Site was viewed from the adjacent sidewalk areas and public rights of way. At the time of the inspection, the weather was sunny and approximately 80 °F, and the visibility of the Site was not obscured by weather conditions.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled recognized environmental condition (CREC) – A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

Historical recognized environmental condition (HREC) – A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

Recognized environmental condition (REC) - The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2)

under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissance*, *interviews*, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) – The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater, or both, either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify *RECs*, *CRECs*, *VECs*, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site as a public school facility. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Phase I ESA Update included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl (PCB) - containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with the ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.
- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.
- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

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- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.
- Evaluating information contained within federal and state environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity
- An assessment in accordance with ASTM E 2600-10 for a vapor encroachment condition (VEC)
- A review of available wetlands data
- A visual assessment for water damage and mold
- A visual assessment for suspect ACM
- A visual assessment for suspect LBP
- An assessment of potential methane generation on-site or migration to the Site
- Regulatory compliance
- PCB light ballasts and caulking materials
- Biological agents (mold, pigeon guano, medical waste, etc.)
- Air emissions from dry cleaners and other industrial sources
- An assessment of the potential presence of electromagnetic fields (EMF)
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The buildings on the eastern portion of the Site were in disrepair and inaccessible and viewed from the surrounding sidewalks and public rights-of-way. As such, potential RECs within the Site buildings could not be investigated during the site reconnaissance.
- The property area history review was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical Sanborn maps, aerial photographs, city directories, and local records, and this data gap is not likely to alter the conclusions of this report.

2.4 Limitations and Exceptions

AKRF Engineering, P.C. (AKRF) has prepared this Phase I ESA Update using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA Update was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

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This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. AKRF makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable federal, state and local laws, regulations and codes.

Regardless of the findings stated in this report, AKRF is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

This report was prepared for the sole use of NYCSCA and related New York City municipal agencies pursuant to the AKRF Contract dated August 1, 2014.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

This report summarizes the results of the Phase I ESA Update of the Site located at 4302-4310 Fourth Avenue and 364 43rd Street, Brooklyn, Kings County, New York 11232. The legal description of the Site is Block 728, Lots 34 and 36.

The Site consists of two adjacent lots: an approximately 10,000- SF lot on the eastern portion of the Site (Lot 36) developed with a vacant, three-story building with a basement and an adjoining vacant two-story building with exterior landscaped areas; and an approximately 2,500-SF vacant lot on the western portion of the Site (Lot 34) used for surface parking. The NYCSCA is considering purchasing the Site for redevelopment and use as a public school facility. The Site is located in a primarily residential and commercial area, and is abutted to the north by 43rd Street, followed by former St. Michael's School (currently occupied by P.S. 516 Elementary School) and St. Michael's Church, to the east by Fourth Avenue, followed by residential buildings and a deli, to the south by residential buildings with street-level restaurants and convenience stores, and to the west by private dwellings.

According to the New York City Department of Buildings (NYCDOB) and the Department of City Planning (NYCDCP) zoning map, the eastern Site lot is currently zoned R7A (Residential) with a C2/4 Commercial Overlay and the western Site lot is currently zoned as R6B (Residential). Neither the Site nor adjacent properties contain Hazardous Materials "E" Designations. The Site does not contain a "D" Restrictive Declaration. A map showing the location of the Site is presented in *Appendix A*. A Site plan showing the physical layout including adjacent land use is presented in *Appendix B*. Photographs of Site and surrounding areas are included in *Appendix C*. A zoning map is included in *Appendix J*.

Based on observations made during the Site inspection, no significant changes have occurred on the Site since the most recent Sanborn map dated 2007, as noted in Section 5.4.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS.) 7.5-Minute Quadrangle Map, Jersey City, New York-New Jersey, dated 2014, the elevation of the Site is approximately 65 feet above the National Geodetic Vertical Datum of 1929 (an approximation of mean sea level). The topography of the immediate Site area was observed to slope moderately downward to the west. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

According to Reconnaissance of the Ground Water Resources of Kings and Queens Counties, New York; USGS, bedrock is approximately 250 feet below grade in the vicinity of the Site. The crystalline bedrock is overlain, in sequence, by Raritan Formation clay, Gardiners Clay, and Upper Pleistocene deposits of the Wisconsin Glaciation.

3.2.3 Soils

According to the New York City Soil Reconnaissance Soil Survey compiled by the United States Department of Agriculture-Natural Resources Conservation Service, soils beneath the Site are described as: urbanized areas with more than 80 percent of the surface covered by impervious pavement and buildings, with till plains and moraines overlain by a mixture of anthropogenic and gneissic till soils. Previous subsurface investigations conducted at the Site (discussed further in section 5.6) indicated that the Site was underlain by sandy fill material consisting of fine- to medium-grained sand with some clay, and fragments of brick, concrete, and wood from surface grade to approximately 15 feet below ground surface (bgs) followed by apparent native soil consisting of brown fine- to medium-grained sand with some clay and gravel.

3.2.4 Hydrology

Based on data in *Water-Table Altitude in Kings and Queens Counties, New York in March 1997*; U.S. Geological Survey, the anticipated depth to groundwater in the vicinity of the Site is approximately 30 to 35 feet below grade surface. Previous subsurface investigations conducted at the Site (discussed further in section 5.6) indicated that groundwater was encountered between approximately 30 and 37 feet bgs. Based on the groundwater gradient indicated by the water table altitude map, groundwater most likely flows in a westerly direction toward the Bay Ridge Channel. However, actual groundwater flow at the Site can be affected by many factors including past filling activities, underground utilities and other subsurface openings or obstructions such as basements, nearby subway lines including the east adjacent R subway line beneath Fourth Avenue and other factors beyond the scope of this study. There are no surface water bodies or streams on or immediately adjacent to the Site. The closest open surface water to the Site is the Bay Ridge Channel, located approximately ½ mile to the west-northwest. Stormwater in the Site vicinity flows to the New York City combined sanitary/stormwater sewer system. No public water supply wells were noted within a one-mile radius of the Site in the EDR report.

AKRF reviewed the United States Fish and Wildlife Service National Wetlands Index (NWI) map for the area of the Site (<http://www.fws.gov/wetlands/data/index.html>) to determine whether the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. No suspected wetlands were observed during the Site inspection. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the Site area was reviewed to assess whether the Site is located within a designated flood plain or flood zone. The Site is located in Zone X area, which is defined by FEMA as an area located outside of the 500-year flood zone. A copy of the FEMA map for the Site area is included in *Appendix E*.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

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The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to NYSDOH, 452 basement-level radon tests were conducted in Kings County in 2016. The average basement radon level was found to be 1.98 picoCuries per liter (pCi/L). According to data presented in the regulatory agency database report (*Appendix I*), the average indoor radon level is 0.620 pCi/L in living areas and 0.970 pCi/L for basements in Kings County, based on 81 tested locations. Radon testing conducted at the Site in 2010 (see Section 5.6) indicated concentrations consistent with area radon concentrations and below the United States Environmental Protection Agency (USEPA) Action Level of 4.0 pCi/L. As such, AKRF concludes that it is unlikely that elevated levels of radon gas are present at the Site.

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4.0 ADJOINING AND SURROUNDING PROPERTIES

The general area of the Site consists of mostly residential and commercial properties. The following table summarizes the adjoining property uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	43 rd Street, followed by: P.S. 516 (former St. Michael's School) St. Michael's Church	4214-4224 Fourth Avenue 4202-4212 Fourth Avenue	Public Street Public School Religious Facility
South	Residential Commercial	4314-4324 Fourth Avenue	Private Dwellings Restaurants/Convenience Store
East	Fourth Avenue, followed by: Residential Commercial	4301-4333 Fourth Avenue 405 44 th Street 4201 Fourth Avenue	Public Street with underground R, N, and D subway lines Private Dwellings Convenience Store Salon Senior Housing Center Municipal/NYPD Offices
West	Residential	362 43 rd Street	Private Dwellings

The surrounding area is developed with predominantly residential, commercial, and institutional buildings. The Site is abutted to the north by 43rd Street, followed by former St. Michael's School (currently P.S. 516) and St. Michael's Church. The Site is abutted to the south by residential structures with street-level retail establishments, including restaurants and convenience stores. The Site is abutted to the west by residential structures. Two **dry cleaners** are located on the south-adjacent block at 4402 Fourth Avenue and 4416 Fourth Avenue. Fourth Avenue abuts the Site to the east, followed by residential structures (including a senior housing facility) with street-level retail establishments, including a deli and a hair salon, and a municipal/NYPD office building to the northeast.

AKRF conducted a review of the surrounding properties to determine whether any existing public schools are located within a two-block radius of the Site. At the time of the Site reconnaissance, one public school, P.S. 516 (formerly St. Michael's parochial school) was identified on the north-adjacent block. No sources of air emissions or dust were identified in close proximity to the Site. No significant changes were noted in the surrounding area since the most recent Sanborn map dated 2007, except for an additional senior citizen residence center was located on the southeastern portion of the east-adjacent block along 44th Street.

Based on our inspection of the adjoining properties, the following RECs/VECs were identified:

- Two **dry cleaners** located on the south-adjacent block at 4402 Fourth Avenue, approximately 170 feet south of the Site, and at 4416 Fourth Avenue, approximately 285 feet south of the Site.

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5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

A Land Title Records search was ordered from Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut on May 26, 2016. The current Site owners are listed as Porfirio Santiago (Lot 34) and Brooklyn Police Castle, Inc. (Lot 36). The records indicated an ownership history for the Site as follows:

Block 728, Lot 34:

Year	Grantor/Grantee Listed on Deed
1969	Grantor is Alex Diaz; Grantee is 48 th Street Realty Co, Inc.
1969	Grantor is 48 th Street Realty Co, Inc.; Grantee is Maria Sanchez
1970	Grantor is Maria Sanchez; Grantee is Manuel Rodriguez
1971	Grantor is Anthony E. Maglio; Grantee is Federal National Mortgage Association
1972	Grantor is Federal National Mortgage Association; Grantee is Section of Housing and Urban Development of Washington, DC
1973	Grantor is Section of Housing and Urban Development of Washington, DC; Grantee is Joseph Tepedino
1975	Grantor is Joseph Tepedino; Grantee is Joseph Tepedino
2007	Grantor is Jacqueline Tepedino; Grantee is Porfirio Santiago

Block 728, Lot 36:

Year	Grantor/Grantee Listed on Deed
1974	Grantor is the City of New York; Grantee is Gen Aro Construction Corporation
1979	Grantor is the Commissioner of Finance of the City of New York; Grantee is the City of New York
1985	Grantor is the City of New York; Grantee is Sunset Park School of Music
1999	Grantor is Sunset Park School of Music; Grantee is Brooklyn Community Development Corporation
2012	Grantor is Brooklyn Community Development Corporation; Grantee is Brooklyn Chinese-American Association
2015	Grantor is Brooklyn Chinese-American Association; Grantee is Sunpark LLC
2015	Grantor is Sunpark LLC; Grantee is Brooklyn Police Castle, Inc.

The title information search did not indicate evidence of RECs/VECs in connection with the Site. A copy of the title search is provided in *Appendix J*.

5.2 Historical USGS Topographic Quadrangles

AKRF reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site for the years 1898, 1900, 1905, 1925, 1947, 1955, 1967, 1979/1981, and 2013/2014. The following table summarizes descriptions and interpretations from the historical USGS maps:

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Year	Comments
1898: Staten Island/ Brooklyn Quadrangles 1:62,500	Site: The Site is depicted as part of a developed area with no specific Site features noted. The elevation of the Site appears consistent with the most recent topographic map. Surrounding Properties: The surrounding area contains unspecified urban development and vacant land. The Bay Ridge Channel and Gowanus Bay are located approximately ½ mile northwest of the Site. Sea Beach Railroad is located approximately one mile south of the Site. Greenwood Cemetery is shown approximately ¾ mile east and northeast of the Site.
1900: Staten Island/ Brooklyn Quadrangles 1:62,500	Site: No significant changes from the 1898 map are noted. Surrounding Properties: The wider surrounding area contains denser unspecified urban development. No other significant changes from the 1898 map are noted.
1905: Passaic Quadrangle 1:25,000	Site: No specific development features are legible on-Site or in the surrounding area, however no significant changes from the 1900 map are anticipated based on previous and subsequent maps. Surrounding Properties: Although no specific development features are legible in the surrounding area, no significant changes from the 1900 map are anticipated. The adjoining quadrangle to the east is not mapped.
1925: Staten Island Quadrangle 1:62,500	Site: No significant changes from the previous maps are noted. Surrounding Properties: No significant changes from the previous maps are noted.
1947: Jersey City/ Brooklyn Quadrangles 1:24,000	Site: The Site is depicted as part of a more densely developed area with no specific Site features noted. Surrounding Properties: The surrounding area contains denser unspecified urban development. St. Michael's Church is shown in the north-adjacent block. Sunset Park is depicted approximately 1,000 feet east of the Site. The elevated Third Avenue (currently Gowanus) Expressway is noted one block west of the Site. P.S. 136 is located three blocks to the north of the Site. Bush Terminal is noted to the west along the Bay Ridge Channel shoreline.
1955: Jersey City Quadrangle 1:24,000	Site: No significant changes from the 1947 map are noted. Surrounding Properties: The greater area surrounding the Site is shaded pink, indicating unspecified urban development. A courthouse is noted on the northeast-adjacent block, approximately 200 feet from the Site. A hospital is shown approximately 500 feet south of the Site. P.S. 2 is noted three blocks to the south.
1967: Jersey City/ Brooklyn Quadrangles 1:24,000	Site: No significant changes from the 1955 map are noted. Surrounding Properties: P.S. 1 is noted three blocks to the south. No further significant changes from the 1955 map are noted.
1979/1981: Jersey City/ Brooklyn Quadrangles 1:24,000	Site: No significant changes from the 1967 map are noted. Surrounding Properties: No significant changes from the 1967 map are noted.
2013/2014: Jersey City/ Brooklyn Quadrangles 1:24,000	Site: No significant changes from the 1979/1981 maps are noted. Surrounding Properties: No significant changes from the 1979/1981 maps are noted.

*RECs/CRECs/HRECs/VECs, if found, are listed in **Bold** font.*

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No RECs/VECs or evidence of landfilling or former wetlands/water bodies indicating potential elevated methane conditions were identified in the Site vicinity in a review of the historical USGS Topographic Quadrangles.

Copies of the historical USGS topographic maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

AKRF reviewed aerial photographs of the Site and surrounding areas provided by EDR to identify historical land uses that may have involved hazardous substances and petroleum products. These photographs ranged from 1924 to 2011. The following table summarizes descriptions and interpretations from the aerial photograph reviews:

Year	Comments
1924 1"≈500'*	Site: The Site appears developed with the current on-site structures on Lot 36 and a small unspecified structure on Lot 34. Surrounding Properties: St. Michael's Church and School are noted on the north-adjacent block. The P.S. 136 building is noted three blocks north of the Site. A north-south trending elevated expressway is shown one block to the west. Sunset Park is shown one block east of the Site. The surrounding blocks are developed with apparent residential and commercial structures.
1940 1"≈500'*	Site: The Site appears similar to the 1924 photograph. Surrounding Properties: An apparent municipal building is noted on the northeast-adjacent block, across Fourth Avenue between 43 rd and 42 nd Streets. No significant changes from the 1924 photograph are noted.
1943 1"≈500'*	Site: The Site appears similar to the 1940 photograph. Surrounding Properties: No significant changes from the 1940 photograph are noted.
1951 1"≈500'*	Site: The Site appears similar to the 1943 photograph. Surrounding Properties: No significant changes from the 1943 photograph are noted.
1954 1"≈500'*	Site: The Site appears similar to the 1951 photograph. Surrounding Properties: No significant changes from the 1951 photograph are noted.
1961 1"≈500'*	Site: The Site appears similar to the 1954 photograph; however, the quality of the aerial photograph is poor, obscuring certain Site features. Surrounding Properties: No significant changes from the 1954 photograph are noted.
1966 1"≈500'*	Site: The Site appears similar to the 1961 photograph. Surrounding Properties: The PS 136 building expanded and includes an adjoining park three blocks north of the Site. No other significant changes from the 1961 photograph are noted.
1980 1"≈500'*	Site: The former small unspecified structure on Lot 34 has been razed and the lot appears to be vacant. The remainder of the Site appears similar to the 1966 photograph; Surrounding Properties: No significant changes from the 1966 photograph are noted.
2006 1"≈500'*	Site: The Site appears similar to the 1980 photograph. Surrounding Properties: The former residential or commercial structures on the southwestern portion of the east-adjacent block are no longer depicted. No other significant changes from the 1980 photograph are noted.
2008 1"≈500'*	Site: The Site appears similar to the 2006 photograph. Surrounding Properties: No significant changes from the 2006 photograph are noted.
2009 1"≈500'*	Site: The Site appears similar to the 2008 photograph. Surrounding Properties: No further significant changes from the 2008 photograph are noted.
2011	Site: The Site appears similar to the 2009 photograph.

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Year	Comments
1"≈500'*	Surrounding Properties: No significant changes from the 2009 photograph are noted.

Notes:

*See photographs in Appendix G for actual scale.

RECs/CRECs/HRECs/VECs, if found, are listed in **Bold** font.

The review of aerial photographs revealed evidence of RECs/VECs as follows:

Potential buried demolition debris/fill material from former on-site structures and/or USTs could be present beneath the Site (i.e., former structures noted on Lot 34 on the 1924 through 1966 aerial photographs)

Copies of reproducible aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. Specifically, Sanborn Fire Insurance maps from 1888, 1906, 1926, 1942, 1951, 1970, 1976, 1978, 1979, 1980, 1982, 1987, 1988, 1990, 1991, 1992, 1993, 1994, 1995, 2001, 2002, 2003, 2004, 2005, 2006, and 2007 were reviewed. The following table presents descriptions and interpretations from the historical fire insurance map review:

Year	Comments
1888	<p>Site: The Site appears as two lots. The eastern lot is vacant and the western lot is developed with a one-story dwelling that fronts 43rd Street.</p> <p>Surrounding Properties: The Site block is developed with dwellings, stores, and stables with some interspersed vacant lots. The north-adjacent block (Block 723) is sparsely developed with dwellings, stores, and stables and St. Michael's School and Church are noted at 1056-1066 Fourth Avenue. A carpenter's shed with an office is noted on the north-adjacent block at 1063-1071 Third Avenue. The blocks to the east and south of the Site are primarily vacant with some sparse dwellings.</p>
1906	<p>Site: The eastern Site lot is developed with a three-story police station, a two-story wagon house and rear stable, and an unlabeled one-story outbuilding adjoining the police station. The former one-story dwelling on the western Site lot is no longer noted. A two-story dwelling appears on the southern portion of the western Site lot.</p> <p>Surrounding Properties: The Site block is more densely developed with dwellings, stores, and stables. A tinsmith is noted west of the Site on the Site block at 4303 Third Avenue. The south-adjacent block is developed with a paper manufacturer with a section labeled "paints" at 366 44th Street, sheds, dwellings, and stores. The Norwegian Lutheran Deaconesses Home and Hospital is located two blocks south of the Site (Block 746). A wagon house, stable, and livery are noted on the east-adjacent block at 413-423 44th Street. St. Michael's Church on the north-adjacent block is redeveloped with a larger church and an attached rectory and chapel immediately southwest of the church complex. The former carpenter's shed and office on the north-adjacent block is shown as a three-story store. Public School No. 136 is noted three blocks north of the Site (on Block 713) at 4002-4024 Fourth Avenue.</p>

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Year	Comments
1926	<p>Site: The wagon house and stable have been converted to a shed and an auto storage garage. The building on the northeastern portion of the Site is relabeled as the 68th Precinct police station. Adjoining jail cells are noted south of the police station in the previously unlabeled one-story outbuilding. The western Site lot remains similar to the 1906 map.</p> <p>Surrounding Properties: The Site block is more densely developed with stores and dwellings. The former tinsmith located west of the Site on the Site block appears as an unlabeled store. The former paper manufacturer on the south-adjacent block is labeled as embroidery works. A gasoline service station with four gasoline tanks is shown on the east-adjacent block at 4313-4323 Fourth Avenue. A cluster of 15 auto storage garages is shown east of the gasoline service station at 405-411 44th Street. The former St. Michael's School on the north-adjacent block is redeveloped and labeled as a Parochial School constructed in 1924. A laundry building was noted on the hospital campus two blocks south of the Site.</p>
1942	<p>Site: No significant changes from the 1926 map are noted.</p> <p>Surrounding Properties: The Site block remains similar to the 1926 map. The 44th Avenue Municipal Court is noted on the northeast-adjacent block. The wagon house, stable, livery, and auto garages noted on earlier maps are no longer shown on the east-adjacent block. The Bay Ridge Day Nursery is shown on the south-adjacent block. The cluster of 15 auto storage garages on the east-adjacent block on the 1926 map is no longer shown. This site appears to have been redeveloped with a building; however, due to the clarity/quality of the map the use is not discernible. A one- to four-story structure labeled "Xaverian Bros" is noted on the north-adjacent block west of the parochial school.</p>
1951	<p>Site: The Site remains similar to the 1942 map.</p> <p>Surrounding Properties: A printer is shown south of the Site on the Site block at 4324 Fourth Avenue. The former embroidery works noted on the south-adjacent block noted on previous maps is relabeled as a lace and embroidery manufacturing facility. A radio parts manufacturer with three gasoline tanks is noted on the east-adjacent block at 405 44th Street. An automotive sales and service shop with a fuel oil tank is located in the eastern portion of the building containing the radio parts manufacturer at 423 44th Street. An undertaker and parking lot are located two blocks northeast of the Site on the western portion of Block 719.</p>
1970	<p>Site: The Site remains similar to the 1951 map.</p> <p>Surrounding Properties: The Site block remains similar to the 1951 map. The lace and embroidery manufacturer on the south-adjacent block on earlier maps is shown as a furniture warehouse. The Norwegian Lutheran Deaconesses Home and Hospital two blocks south of the Site on earlier maps is labeled as the Lutheran Medical Center. The former gasoline filling station located at 4313-4323 Fourth Avenue on the east-adjacent block is no longer shown and appears vacant. The building formerly containing the radio parts manufacturer and auto sales/service shop on previous maps on the east-adjacent block is redeveloped as a loft and the three gasoline tanks are no longer denoted. The Fourth Avenue Municipal Court noted on earlier maps on the northeast-adjacent block is labeled as the NYC Job Preparation Center. The former embroidery and lace manufacturing facility on the south-adjacent block is now depicted as a furniture warehouse. The parking lot two blocks northeast of the Site is labeled as a used auto sales lot.</p>
1976	<p>Site: The 68th Precinct police station, adjoining jail cells, and auto garage on the eastern Site lot are relabeled as a youth center. The two-story dwelling on the western Site lot has been razed.</p> <p>Surrounding Properties: No significant changes from the 1970 map are noted in the surrounding area.</p>
1978	<p>Site: The Site remains similar to the 1976 map.</p> <p>Surrounding Properties: The NYC Job Preparation Center on the northeast-adjacent block is labeled as the Sunset Park Senior Citizens Center. No other significant changes from the 1976 map are noted in the surrounding area.</p>

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Year	Comments
1979	Site: The Site remains similar to the 1978 map. Surrounding Properties: The Lutheran Medical Center located two blocks south of the Site on earlier maps is no longer shown. No other significant changes from the 1978 map are noted in the surrounding area.
1980	Site: The Site remains similar to the 1979 map. Surrounding Properties: No significant changes from the 1979 map are noted in the surrounding area.
1982	Site: The Site remains similar to the 1980 map. Surrounding Properties: The “Xaverian Bros” structure on the north-adjacent block in earlier maps is labeled as the Center for Family Life. No other significant changes from the 1980 map are noted in the surrounding area.
1987	Site: The Site remains similar to the 1982 map. Surrounding Properties: No significant changes from the 1982 map are noted in the surrounding area.
1988	Site: The Site remains similar to the 1987 map. Surrounding Properties: No significant changes from the 1987 map are noted in the surrounding area.
1990	Site: The Site remains similar to the 1988 map. Surrounding Properties: No significant changes from the 1988 map are noted in the surrounding area.
1991	Site: The Site remains similar to the 1990 map. Surrounding Properties: The former gasoline filling station (and subsequent vacant lot) noted on the east-adjacent block on prior maps was redeveloped with residential structures. No other significant changes from the 1990 map are noted in the surrounding area.
1992	Site: The Site remains similar to the 1991 map. Surrounding Properties: No significant changes from the 1991 map are noted in the surrounding area.
1993	Site: The Site remains similar to the 1992 map. Surrounding Properties: A medical center is noted on the north-adjacent block at 4201-4223 Third Avenue. No other significant changes from 1992 map are noted in the surrounding area.
1994	Site: The Site remains similar to the 1993 map. Surrounding Properties: No significant changes from the 1993 map are noted in the surrounding area.
1995	Site: The Site appears similar to the 1994 map. Surrounding Properties: No significant changes from the 1994 map are noted in the surrounding area.
2001	Site: The Site appears similar to the 1995 map. Surrounding Properties: A parking lot is shown west of the Site on the Site block at 358 43 rd Street. A parking lot is noted at 349-359 43 rd Street on the north-adjacent block. The used auto sales lot located two blocks northeast of the Site on the western portion of Block 719 on earlier maps is labeled as a parking lot.
2002	Site: The Site appears similar to the 2001 map. Surrounding Properties: No significant changes from the 2001 map are noted in the surrounding area.
2003	Site: The Site appears similar to the 2002 map. Surrounding Properties: A parking garage is noted west of the Site on the Site block at 4323 Third Avenue. No other significant changes from the 2002 map are noted in the surrounding area.

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Year	Comments
2004	Site: The Site appears similar to the 2003 map. Surrounding Properties: No significant changes from the 2003 map are noted in the surrounding area.
2005	Site: The Site appears similar to the 2004 map. Surrounding Properties: The loft and auto sales and service shop located at 405-423 44 th Street on the east-adjacent block on earlier maps are no longer shown. No other significant changes from the 2004 map are noted in the surrounding area.
2006	Site: The Site appears similar to the 2005 map. Surrounding Properties: No significant changes from the 2005 map are noted in the surrounding area.
2007	Site: The Site appears similar to the 2006 map. Surrounding Properties: No significant changes from the 2006 map are noted in the surrounding area.

*RECs/CRECs/HRECs/VECs, if found, are listed in **Bold** font.*

The review of fire insurance maps indicated the following RECs/VECs:

- The Site formerly contained a two-story **auto storage garage** (1926-1970 Sanborn maps).
- **Potential buried demolition debris/fill** material from former on-site structures and/or USTs could be present beneath the Site (i.e., the former dwellings on Lot 34 noted on the 1888 through 1970 Sanborn maps).
- A **printer** at 4324 Fourth Avenue, approximately 100 feet south of the Site on the 1951-2007 Sanborn maps.
- The east-adjacent block included: a **gasoline service station** with four gasoline tanks at 4313-4323 Fourth Avenue, approximately 100 feet southeast of the Site (1926-1951 Sanborn maps); a cluster of **15 auto storage garages** at 405-411 Fourth Avenue, approximately 200 feet southeast of the Site (1926 Sanborn map); a **radio parts manufacturer** with three gasoline tanks at 405 44th Street, approximately 200 feet southeast of the Site (1951 Sanborn map); and an **automotive sales and service shop** with a fuel tank at 423 44th Street, approximately 275 feet southeast of the Site (1951-2004 Sanborn maps).
- The south-adjacent block included a **paper manufacturer** (1906 Sanborn map) and a **lace and embroidery works/manufacturer** (1926-1951 Sanborn maps) at 366 44th Street, approximately 190 feet southwest of the Site.

Additional automotive-related uses were noted in the surrounding area further northwest of the Site along Third Avenue and along the waterfront. Based on their distance from the Site and/or downgradient or cross-gradient locations relative to the presumed groundwater flow direction, these additional facilities are not anticipated to have affected the Site subsurface and are not considered RECs/VECs.

A copy of the Historical Fire Insurance Map report is included in *Appendix H*.

5.5 City Directories

A search for historical city directories was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews:

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Year	Comments
1928	Site: Residential Surrounding Properties: Residential
1934	Site: Residential Surrounding Properties: Residential, St. Michael's Grammar School (369 43 rd Street), Fourth Avenue Hand Laundry (4324 Fourth Avenue)
1940	Site: Residential Surrounding Properties: Residential, Commercial, Fourth Avenue Hand Laundry (4324 Fourth Avenue)
1945	Site: Residential Surrounding Properties: Residential, Commercial, Delloy Metals (4314 Fourth Avenue), Continental Cutter Supply (4314 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Fourth Avenue Hand Laundry (4324 Fourth Avenue)
1949	Site: Residential Surrounding Properties: Residential, Institutional, Empire Tool Company (4314 Fourth Avenue), St. Anthony Shoppe (4318 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Fourth Avenue Hand Laundry (4324 Fourth Avenue)
1960	Site: Residential Surrounding Properties: Residential, Institutional, Miraldi's Restaurant and Pizzeria (4314 Fourth Avenue), St. Anthony Shoppe (4318 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Fourth Avenue Hand Laundry (4324 Fourth Avenue)
1965	Site: Not listed Surrounding Properties: Residential, Institutional, Urso's Pizzeria (4314 Fourth Avenue), Rufano's Candy and Soda Shoppe (4316 Fourth Avenue), St. Anthony Shoppe (4318 Fourth Avenue), Luis Grocery (4320 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Elisa Launderette, Inc. (4402 Fourth Avenue)
1970	Site: Not listed Surrounding Properties: Residential, Urso's Pizzeria (4314 Fourth Avenue), Varela Travel Agency (4318 Fourth Avenue), Thomas Grocery (4320 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Domena Restaurant (4324 Fourth Avenue), Elisa Launderette, Inc. (4402 Fourth Avenue)
1973	Site: Not listed Surrounding Properties: Residential, Aletto's Restaurant / Aletto Joe Pizzeria (4314 Fourth Avenue), Varela Travel Agency (4318 Fourth Avenue), Leeder and Leeder Insurance (4318 Fourth Avenue), Thomas Grocery (4320 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Santoro Launderette, Inc. (4402 Fourth Avenue)
1976	Site: Louis Polsky Hardware Paints (4312 Fourth Avenue) Surrounding Properties: Residential, Aletto's Restaurant / Aletto Joe Pizzeria (4314 Fourth Avenue), Varela Travel Agency (4318 Fourth Avenue), Leeder and Leeder Insurance (4318 Fourth Avenue), Thomas Grocery (4320 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue), Santoro Launderette, Inc. (4402 Fourth Avenue)
1980	Site: Not listed Surrounding Properties: Residential, Varela Travel Agency (4318 Fourth Avenue), Leto Printing Service (4324 Fourth Avenue)
1985	Site: Not listed Surrounding Properties: Residential, Kings Ecuador Moving (4314 Fourth Avenue), Varela Travel Agency (4318 Fourth Avenue), Western Union Agents Bilko Check Cashing (4318 Fourth Avenue), Bay Ridge Sign Shop (4324 Fourth Avenue), Santoro Launderette, Inc. (4402 Fourth Avenue)

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Year	Comments
1992	Site: Not listed Surrounding Properties: Residential, Kings Ecuador Moving (4314 Fourth Avenue), Bay Ridge Sign Company (4324 Fourth Avenue) , Los Chintos Inc. (4324 Fourth Avenue), Santoro Launderette, Inc. (4402 Fourth Avenue)
1997	Site: Not listed Surrounding Properties: Residential, Lislusa Grocery (4320 Fourth Avenue), Bay Ridge Sign Company (4324 Fourth Avenue) , Amigos Barber Shop (4324 Fourth Avenue),
2000	Site: Not listed Surrounding Properties: Residential
2005	Site: Not listed Surrounding Properties: Residential, Built Art Corporation (4314 Fourth Avenue), Iglesias Grocery (4320 Fourth Avenue), 4 th Avenue Towing dispatch (4324 Fourth Avenue), Nino Furniture (4324 Fourth Avenue), Amigos Barber Shop (4324 Fourth Avenue), Double Dragon (4318 Fourth Avenue)
2008	Site: Not listed Surrounding Properties: Residential, Iglesias Grocery (4320 Fourth Avenue), Nino Furniture (4324 Fourth Avenue), No Silver Palace Restaurant & Baker (4324 Fourth Avenue), Amigos Barber Shop (4324 Fourth Avenue), Double Dragon (4318 Fourth Avenue)
2013	Site: Not listed Surrounding Properties: Residential, 4 th Avenue Towing Twenty Four (4324 Fourth Avenue), 99 Cent Store (4402 Fourth Avenue), New Double Dragon (4318 Fourth Avenue)

Notes:

*RECs/CRECs/HRECs/VECs, if found, are listed in **Bold font***

The review of historical city directories did not indicate any RECs/VECs at the Site. The following RECs/VECs were identified at surrounding properties:

- Potential industrial uses were identified south-adjacent to the Site at 4314 Fourth Avenue including **Delloy Metals** and **Continental Cutter Supply** in the 1945 directory, and **Empire Tool Company** in the 1949 directory.
- A printing facility was identified approximately 100 feet south of the Site at 4324 Fourth Avenue (**Leto Printing Service** in the 1945-1980 directories, subsequently listed as **Bay Ridge Sign Shop** on the 1985-1997 directories). This facility was also labeled as a **hand laundry** in the 1934 through 1960 directories (drycleaning activities could have been conducted at the laundry).
- A **launderette** was identified on the 1965 through 1992 directories at 4402 Fourth Avenue on the south-adjacent block (although not specified in the city directory information, this facility was identified as a drycleaner in previous reports and the regulatory database information)

A copy of the Historical City Directories is included in Appendix J.

5.6 Prior Reports

The following reports were reviewed:

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Lot 34

Langan Engineering and Environmental Services, P.C.(Langan), Phase I Environmental Site Assessment of Proposed New School at 364 43rd Street, Brooklyn, NY 11232, dated June 10, 2010

Langan conducted a Phase I Environmental Site Assessment (ESA) of the western portion of the Site (Lot 34) in June 2010. The Phase I ESA did not identify on-site RECs for Lot 34, but identified several off-site RECs, including nearby historical petroleum storage tanks, dry cleaning facilities, and historical industrial/automotive uses, including a gasoline filling station, a radio parts manufacturing facility, a metals company, a paper ornament and embroidery manufacturing facility, and automobile repair facilities. Environmental concerns identified during the Phase I ESA included potentially elevated radon concentrations and the potential for ACM, LBP and PCB-containing materials in building components. Environmental concerns included possible elevated radon concentrations and potential for ACM, LBP or PCB-containing materials. Langan recommended a Phase II (Subsurface) Environmental Investigation be conducted to investigate whether potential off-site RECs had affected the suitability of the Site for use as a public school facility.

Langan Engineering and Environmental Services, P.C., Phase II Environmental Site Investigation of Proposed New School at 364 43rd Street, Brooklyn, NY 11232, dated July 27, 2010.

Langan performed a Phase II Environmental Site Investigation the western portion of the Site (Lot 34) in June 2010. Field activities included a geophysical survey, the advancement of three soil borings (with a temporary well point installed in one of the borings), with the collection and analysis of four soil samples, two subsurface soil vapor samples, and one ambient air sample. Soil and groundwater samples were analyzed for Target Compound List (TCL) and Spill Technology and Remediation Series (STARS) Memorandum No. 1 VOCs and semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) 8 metals (filtered analysis for groundwater), and PCBs. Soil vapor samples were analyzed for analyzed for VOCs by EPA Method TO-15. Soil sample analytical results were compared to NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives for Unrestricted Use (UUSCOs) and Restricted – Residential Use (RRSCOs). The groundwater samples were compared to the Class GA Ambient Water Quality Values (AWQVs), as listed in NYSDEC Division of Water Technical Operational and Guidance Series (TOGS) 1.1.1 The soil vapor samples were compared to the indoor air criteria published in the 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH Guidance), specifically to NYSDOH Air Guideline Values (AGVs) and to background levels of VOCs in indoor air presented in the NYSDOH Guidance, including Upper Fence Limit Indoor Air Values from “Table C-1 NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes,” 90th Percentile indoor air values from “Table C-2 - EPA 2001: Building Assessment and Survey Evaluation (BASE) Database, SUMMA canister method”, and the 95th Percentile Indoor Air Values from “Table C-5, Health Effects Institute (HEI) 2005: Relationship of Indoor, Outdoor and Personal Air” published in the NYSDOH Guidance, Appendix C. Soil boring logs included in the Langan report indicated that the Site was underlain by historic fill, consisting of mainly sand with varying amounts of clay and brick, wood and concrete fragments, extending to 15 feet bgs. Soil borings were advanced to depths between approximately 15 to 50 feet below grade. One of the borings was advanced to 57 feet below grade to install a temporary monitoring well. Additionally, one pre-design waste characterization sample was collected by compositing soil from one of the soil borings and analyzed for pesticides, total cyanide, hexavalent chromium and total petroleum hydrocarbons (TPH) diesel and gasoline range organics (DRO/GRO). Pertinent results of the investigation included:

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- No subsurface anomalies consistent with USTs were identified in the geophysical survey.
- Laboratory analytical results for soil samples indicated that acetone and methylene chloride (VOCs) were detected in three soil samples (as well the laboratory provided field blank and, therefore, attributable to laboratory contamination) below the Unrestricted Use Soil Cleanup Objectives (SCOs). Soil analytical results indicated SVOCs and metals at concentrations below their Unrestricted Use SCOs, with the exception of lead at one sample location. Langan indicated that, based on the isolated occurrence, the lead detection appeared to be a localized constituent of historic fill and not an indication of a release.
- Groundwater was encountered at approximately 37 feet below grade in the temporary monitoring well. Laboratory analytical results for groundwater samples indicated that VOCs and metals were detected at concentrations below their respective NYSDEC Ambient Water Quality Standards (AWQS) values. SVOCs and PCBs were not detected in the groundwater sample.
- Soil vapor sample analytical findings indicated that concentrations of VOCs were detected in one or more sample locations, at concentrations below the corresponding NYSDOH Air Guidance Values (AGVs) in both samples. Certain VOCs were detected at concentrations greater than the indoor background levels in one or both soil vapor samples including: 1,2,4-trimethylbenzene; 1,3-dichlorobenzene; benzene; chlorobenzene; chloroethane; chloromethane; ethylbenzene; o-xylene; PCE; and vinyl chloride at concentrations not atypical of urban areas. Tetrachloroethylene (PCE) was detected at concentrations between 78 and 90 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) (above the current $30 \mu\text{g}/\text{m}^3$ AGV).
- Ambient air sample analytical results indicated that concentrations of VOCs were detected; however, none of the compounds were detected at concentrations exceeding anticipated background concentrations or NYSDOH AGVs.
- Pre-characterization analytical results indicated that pesticides, total cyanide, hexavalent chromium and total petroleum hydrocarbons (TPH) diesel and gasoline range organics (DRO/GRO) were not detected in the waste characterization soil sample.

Langan concluded that detections of VOCs in soil vapor samples were attributed to an off-site source or laboratory artifacts and are not indicative of an on-Site release. Detected concentrations of lead and SVOCs in soil were noted to be attributable to background conditions observed in historic fill and not indicative of an on-site release.

Langan recommended that, based on the findings of the soil vapor investigation at the adjacent property (Lot 36) conducted concurrently with this investigation (discussed below), a soil vapor barrier and active sub-slab depressurization system (SSDS) should be integrated into the proposed new school, including the addition of any proposed damp-proofing or waterproofing components. Langan recommended additional soil characterization prior to excavation and off-site removal, as required by soil waste management facilities and proper management/disposal of potential ACM, LBP and suspected PCB-containing materials. Langan noted that construction dewatering, if required, should be performed in accordance with applicable local, state and federal regulations. Based on the results of preliminary design sampling it was noted that excess soil generated during the proposed construction should be classified as nonhazardous material. Langan noted that any post-construction exposed soil (landscaped areas) should be covered with at least two feet of environmentally clean fill meeting the requirements of Part 375 for unrestricted use.

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Lot 36

Langan Engineering and Environmental Services, P.C (Langan), Phase I Environmental Assessment of Proposed New School 4302-4310 4th Avenue, Brooklyn, NY 11232, dated April 21, 2010

Langan conducted a Phase I Environmental Site Assessment (ESA) for the NYCSCA of the eastern portion of the Site (Lot 36) in April 2010. The Phase I ESA identified on-site RECs related to a potential fuel oil aboveground storage tank (AST) or underground storage tank (UST) and fuel oil-fired boiler, and potential historic automotive use based on an auto storage garage noted on Sanborn maps. Off-site RECs were identified, including existing and historical petroleum storage tanks, dry cleaning facilities, a metals company, industrial facilities, an automobile repair facility, and manufacturing facilities. Environmental concerns identified during the Phase I ESA included potentially elevated radon concentrations and the potential for asbestos-containing material (ACM), lead-based paint (LBP) and polychlorinated biphenyl (PCB)-containing materials in buried structures that formerly occupied the Site. Langan recommended a Phase II (Subsurface) Environmental Investigation be conducted to investigate whether potential off-site RECs had affected the suitability of the Site for use as a public school facility.

Langan Engineering and Environmental Services, P.C., Phase II Environmental Site Investigation of Proposed New School 4302-4310 4th Avenue, Brooklyn, NY dated July 14, 2010

Langan performed a Phase II Environmental Site Investigation of the eastern portion of the Site (Lot 36) between April and June 2010. Field activities included a geophysical survey of accessible portions of the Site, the advancement of seven soil borings, with the collection and laboratory analysis of nine soil samples, one sub-slab vapor sample, four subsurface soil vapor samples and one ambient air sample, one radon sample, and the installation of two temporary monitoring wells with the collection and analysis of two groundwater samples. Soil and groundwater samples were analyzed for Target Compound List (TCL) and Spill Technology and Remediation Series (STARS) Memorandum No. 1 VOCs and semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) 8 metals (filtered analysis for groundwater), and PCBs. Soil vapor samples were analyzed for VOCs by EPA Method TO-15. Soil sample analytical results were compared to NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives for Unrestricted Use (UUSCOs) and Restricted – Residential Use (RRSCOs). The groundwater samples were compared to the Class GA Ambient Water Quality Values (AWQVs), as listed in NYSDEC Division of Water Technical Operational and Guidance Series (TOGS) 1.1.1 The soil vapor samples were compared to the indoor air criteria published in the 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH Guidance), specifically to NYSDOH Air Guideline Values (AGVs) and to background levels of VOCs in indoor air presented in the NYSDOH Guidance, including Upper Fence Limit Indoor Air Values from “Table C-1 NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes,” 90th Percentile indoor air values from “Table C-2 - EPA 2001: Building Assessment and Survey Evaluation (BASE) Database, SUMMA canister method”, and the 95th Percentile Indoor Air Values from “Table C-5, Health Effects Institute (HEI) 2005: Relationship of Indoor, Outdoor and Personal Air” published in the NYSDOH Guidance, Appendix C.

Soil boring logs prepared by Langan indicated shallow sandy fill materials, consisting of sand with varying amounts of silt, clay and brick and concrete fragments, from surface grade to approximately 10 feet bgs. Additionally, two pre-design waste characterization sample were collected by compositing soil from two of the soil borings and analyzed for pesticides, total cyanide, hexavalent chromium and TPH

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diesel and DRO/GRO. The seven soil borings were advanced to depths ranging from 15 to 45 feet below grade. Pertinent findings included:

- No subsurface anomalies consistent with USTs were identified in the geophysical survey; however, it was noted that a suspected fuel oil tank was located within the three-story building, which was inaccessible during the investigation.
- Laboratory results for soil samples indicated several VOCs were detected in one or more samples including 1,2,4-trimethylbenzene, acetone, p- and m-xylenes and methylene chloride at levels below the Unrestricted Use SCOs. It was noted that acetone and methylene chloride were detected in the laboratory field blank analyses, indicating their presence as potential laboratory contaminants. The VOCs 1,2,4-trimethylbenzene and p- and m-xylenes were detected at estimated concentrations below their reporting limits. SVOCs and PCBs were not detected in any of the soil samples.
- Metals were detected in one or more soil samples at concentrations below their respective Unrestricted Use SCOs, with the exception of chromium at one sample location at a concentration of 41.4 milligrams per kilogram (mg/kg), exceeding its Unrestricted Use SCO of 30 mg/kg. Langan stated that, based on the isolated occurrence, the chromium detection appeared to be a localized constituent of historic fill and not an indication of a release.
- Sub-slab and subsurface soil vapor analytical findings indicated that several VOCs were detected in one or more sample locations. Concentrations of methylene chloride and tetrachloroethylene were detected at concentrations below corresponding NYSDOH AGVs in each of the five soil vapor samples. Trichloroethylene (TCE) was detected in the sub-slab vapor point at a concentration of 7.1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), above the NYSDOH AGV of $5 \mu\text{g}/\text{m}^3$ (the standard used at that time). It was noted that TCE was not detected in the soil samples or in soil or groundwater at the Site. Certain compounds were detected at concentrations greater than their respective indoor background levels in the sub-slab soil vapor sample or one or more of the four subsurface soil vapor samples, including toluene, PCE, p- & m-xylenes, o-xylene, methylene chloride, ethyl benzene, benzene, 1,3-dichlorobenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and 1,1-dichloroethane. Tetrachloroethylene (PCE) was detected in five samples at concentrations between 39 and $57 \mu\text{g}/\text{m}^3$ (above the current $30 \mu\text{g}/\text{m}^3$ AGV).
- Groundwater was encountered at depths ranging approximately from 30.5 feet to 36.5 feet below grade. Two VOCs (acetone and methylene chloride) were detected in both samples below their reporting limit and in the laboratory provided field blank samples (indicating their detections as potential laboratory contaminants). None of the VOCs were detected at concentrations greater than their respective NYSDEC AWQS or Guidance Values. No SVOCs or PCBs were detected in groundwater samples collected during the investigation. One metal, barium, was detected at both sample locations below its corresponding NYSDEC AWQS.
- Radon testing (one sample collected from the ground floor of the two-story building) indicated levels consistent with area radon concentrations at a concentration of 1.2 pCi/L, below the USEPA Action Level of 4.0 pCi/L; therefore, it was noted that radon is not an environmental concern at the Site.

Based on the results of the Phase II Environmental Site Investigation, Langan concluded the following. TCE was detected in the sub-slab soil vapor sample at a concentration above its corresponding NYSDOH AGV; however, TCE was not detected in soil or groundwater at the Site. The source of TCE in soil vapors was noted to be potentially associated with nearby dry cleaning facilities located in close proximity to the Site (within 300 feet). Langan concluded that other VOCs detected in soil vapor

samples were likely attributed to off-site sources, laboratory artifacts, and/or potentially historic fill, and not indicative of an on-site release.

Langan recommended that, based on the findings of the soil vapor investigation, a vapor barrier and an active SSDS should be integrated into the proposed new school, including the addition of any proposed damp-proofing or waterproofing components. Langan recommended additional characterization of soil prior to excavation and proper management/disposal of any petroleum storage tanks (and any contaminated soil) encountered during redevelopment, and proper management/disposal of potential ACM, LBP and suspected PCB-containing materials. Langan noted that construction dewatering, if required, should be performed in accordance with applicable local, state and federal regulations. Based on the results of preliminary design sampling it was noted that excess soil generated during the proposed construction should be classified as nonhazardous material. Langan noted that any post-construction exposed soil (landscaped areas) should be covered with at least two feet of environmentally clean fill meeting the requirements of Part 375 for unrestricted use.

The analytical results of Langan's investigations indicated VOCs at levels below the Unrestricted Use SCOs and select SVOCs and metals at concentrations above their Unrestricted Use SCOs including lead at one sample location (Lot 34) and chromium at one sample location (Lot 36) that were noted to be attributable to fill materials (no other metals were detected at concentrations exceeding the SCOs). Groundwater analytical results for both lots indicated VOCs and metals below their respective NYSDEC AWQS values; SVOCs and PCBs were not detected in the groundwater samples. Soil vapor analytical results indicated an elevated detection of TCE in a sub-slab vapor point collected on Lot 36 at a concentration of 7.1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), above the NYSDOH AGV of 5 $\mu\text{g}/\text{m}^3$ (the guideline used at that time, the current AGV is 2 $\mu\text{g}/\text{m}^3$). PCE was detected in five soil vapor samples on Lot 36 at concentrations between 39 and 57 $\mu\text{g}/\text{m}^3$ and two samples collected from Lot 34 at concentrations between 78 and 90 $\mu\text{g}/\text{m}^3$ (above the current 30 $\mu\text{g}/\text{m}^3$ AGV). Additionally, certain VOCs were detected at concentrations greater than their respective indoor background levels.

Based on the findings of the Phase II, AKRF concurs that the RECs were adequately investigated during Langan's 2010 Phase II ESIs, with appropriate recommendations made for remedial procedures to be implemented during redevelopment in accordance with applicable regulations.

5.7 Other Historical Sources

AKRF reviewed electronic block and lot information for the Site on PropertyShark.com (Property Shark). This website contains information including past and present ownership listings, selected tax records, and NYCDOB files including building permits, and environmental hazards compiled by Toxics Targeting, Inc. of Ithaca, New York. The Property Shark website indicated that the Site was not listed on any databases indicative of contamination, several spills sites and hazardous waste generators were noted in the surrounding neighborhood which is consistent with the regulatory database information summarized in Section 6.0. The Property Shark report is included in Appendix J.

AKRF reviewed the NYC Office of Environmental Remediation (OER) Searchable Property Environmental E-Database (SPEED) for records pertaining to the Site and adjacent properties. The SPEED database includes records of certain vacant properties, New York State Brownfield Opportunity Areas (BOAs), and selected federal, state and local environmental databases. Neither the Site nor adjacent properties were identified in the SPEED database. The SPEED map is provided in Appendix J.

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5.8 Historical Use Interviews

Mr. Matthew Mankovich of the NYCSCA accompanied AKRF to the Site for inspection and answered pertinent questions about the Site. Mr. Mankovich indicated that the eastern Site lot was most recently used as a Youth Center and was previously used as the 68th Precinct Police Station, and had no knowledge of uses at the Site prior to that. Additional information provided by Mr. Mankovich is described in Section 8.2.

5.9 Historical Use Summary

The following table summarizes the findings of the research pertaining to historical Site usage:

YEARS	HISTORICAL USES		SOURCE	COMMENTS
	Site	Surrounding Property		
1888-1898	Vacant land on the eastern Site lot (Lot 36) and one-story dwelling on western Site lot (Lot 34).	Residential, institutional, commercial, stables and vacant land.	Sanborn maps, USGS Topographic maps	1888 Sanborn map is the earliest record identified.
1906-1970	The 68 th Precinct Police Station, automotive storage garage, and jail cells on the eastern Site lot and a two-story dwelling on the western Site lot.	Residential, institutional, commercial, and automotive uses.	Topographic maps, Sanborn maps, City Directories, aerial photographs	<i>RECs</i> : an on-Site auto garage (1926-1970 Sanborn maps); a printer at 4324 Fourth Avenue (1951-1970 Sanborn maps/City Directories); a gasoline service station at 4313-4323 Fourth Avenue (1926-1951 Sanborn maps); a cluster of 15 auto garages at 405-411 44 th Street (1926 Sanborn map); a radio parts manufacturer at 405 44 th Street (1951 Sanborn map); an automotive sales and service shop at 423 44 th Street (1951-1970 Sanborn maps); a paper and embroidery manufacturer at 366 44 th Street (1906-1951 Sanborn maps); Delloy Metals, Empire Tool Company and Continental Cutter Supply at 4314 Fourth Avenue (1945-1949 City Directory); Leto Printing

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YEARS	HISTORICAL USES		SOURCE	COMMENTS
	Site	Surrounding Property		
				Service at 4324 Fourth Avenue in the 1945-1980 directories (also noted as a hand laundry in the 1934 through 1960 directories); a launderette was identified on the 1965 through 1992 directories at 4402 Fourth Avenue on the south-adjacent block.
1971-2007	A Youth Center on the eastern Site lot (sustained fire damage and closed sometime prior to 1999) and vacant land on the western Site lot.	Residential, commercial, manufacturing, and automotive uses.	Topographic maps, Sanborn maps, City Directories, aerial photographs	RECs: Bay Ridge Sign Shop at 4324 Fourth Avenue (1985-1997 City Directory); a printer at 4324 Fourth Avenue (1976-2007 Sanborn maps); and an automotive sales and service shop at 423 44 th Street (1976-2004 Sanborn maps). Two dry cleaners were observed one block south of the Site during the Site reconnaissance, at 4402 Fourth Avenue and 4416 Fourth Avenue.

The review of historical records identified the following RECs/VECs:

- The Site formerly contained a two-story **auto storage garage** (1926-1970 Sanborn maps).
- **Potential buried demolition debris/fill material** from former on-site structures and/or USTs could be present beneath the Site from former on-Site structures (i.e., former dwellings on Lot 34).
- The east-adjacent block included: a **gasoline service station** with four gasoline tanks at 4313-4323 Fourth Avenue, approximately 100 feet southeast of the Site (1926-1951 Sanborn maps); a cluster of **15 auto storage garages** at 405-411 Fourth Avenue, approximately 200 feet southeast of the Site (1926 Sanborn map); a **radio parts manufacturer** with gasoline tanks at 405 44th Street, approximately 200 feet southeast of the Site (1951 Sanborn map); and an **automotive sales and service shop** with a fuel tank at 423 44th Street, approximately 275 feet southeast of the Site (1951-2004 Sanborn maps).
- The south-adjacent block included a **paper manufacturer** (1906 Sanborn map) and a **lace and embroidery works/manufacturer** (1926-1951 Sanborn maps) at 366 44th Street, approximately 190 feet southwest of the Site.
- Potential industrial uses were identified south-adjacent to the Site at 4314 Fourth Avenue including **Delloy Metals** and **Continental Cutter Supply** in the 1945 directory, and **Empire Tool Company** in the 1949 city directory.

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- A **printing facility** was identified approximately 100 feet south of the Site at 4324 Fourth Avenue as noted on the 1951-2007 Sanborn Maps (**Leto Printing Service** in the 1945-1980 city directories, subsequently listed as **Bay Ridge Sign Shop** on the 1985-1997 city directories).

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by Environmental Data Resources, Inc. of Milford, Connecticut (EDR), were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site. AKRF also reviewed the “unmappable” (also referred to as “orphan”) listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary that were identified by AKRF as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of federal and state regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the federal and state records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)

The USEPA is responsible for the research, development and enforcement of national environmental regulations. Certain regulatory programs are deferred by the USEPA to state or tribal entities issuing permits and enforcing compliance. The USEPA Region 2 covers New York, New Jersey, Puerto Rico, US Virgin Islands and seven tribal nations within the region. As directed by EPA personnel (FOIA Specialist) from the Public Outreach Branch, USEPA Region 2, AKRF performed an electronic records search for the Site address on the USEPA MyPropertyInfo electronic information search engine in lieu of a formal Freedom of Information Law (FOIL) request (as no records beyond this search would be found by sending a FOIL request). An electronic search was completed on June 2, 2016, which revealed no records for the Site addresses.

New York State Department of Environmental Conservation (NYSDEC)

The NYSDEC is responsible for the implementation and enforcement of state-mandated environmental regulations to protect the public health and safety. The NYSDEC Region 2 covers New York City. NYSDEC information concerning pertinent environmental records for the Site was requested in a FOIL request dated June 2, 2016. An acknowledgement of the request was received from NYSDEC on June 2, 2016. As of the date of this report, the NYSDEC has not responded to the FOIL request. If issues of potential concern are noted upon receipt of this information, an addendum to this report will be created to discuss relevant findings.

New York State Department of Health (NYSDOH)

The NYSDOH Bureau of Environmental Exposure Investigation is responsible for investigating the potential for human exposure from environmental contamination, including inactive hazardous waste sites. Activities conducted by the NYSDOH include water sampling and treatment; dump site,

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construction site, and spill investigations; and emergency event investigations. The NYSDOH also provides regulatory oversight for state, federal Superfund, Brownfield, and voluntary clean-up sites. NYSDOH information concerning pertinent environmental records for the Site was requested in a FOIL request dated June 2, 2016. An acknowledgement of the request was received from NYSDOH on June 2, 2016. As of the date of this report, the NYSDOH has not responded to the FOIL request. If issues of potential concern are noted upon receipt of this information, an addendum to this report will be created to discuss relevant findings.

A summary of sites identified through the Federal and State regulatory agency databases review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	04/15/16	1 mile	0	No	No
Delisted NPL Site List	04/15/16	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including Superfund Enterprise Management System Archive (SEMS-ARCHIVE) Sites (formerly CERCLIS NFRAP)	05/20/16 04/15/16	½ mile	0 3	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity RCRIS CORRACTS and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	04/05/16	1 mile ½ mile	0 0	No	No
Resource Conservation and Recovery Information System Generators / Transporters (RCRIS Gen/Trans)	04/05/16	¼ mile	14 (+64 Non-Gen)	No	No
Federal Institutional Control/Engineering Control Registries	11/03/16	½ mile	0	No	No
Emergency Response Notification System (ERNS)	05/20/16	Site	0	No	No
Toxic Release Inventory System (TRIS)	04/05/16	¼ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Site (SHWS)	03/22/16	1 mile	5	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	11/30/06	½ mile	2	No	No
Solid Waste Management Facilities Sites (SWMF)	02/11/16	½ mile	4	No	No
Vapor Reopened	12/10/15	1 mile	0	No	No
New York State Spills Information (NY Spills)/ Leaking Storage Tanks Incidents Reports (LTANKS)	03/22/16	½ mile	260/30	No	No

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Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Petroleum Bulk Storage Tanks [Underground Storage Tanks (USTs)/ASTs]	04/20/16	¼ mile	28 (5 UST/23 AST)	No	No
Chemical Bulk Storage Facilities (CBS)	04/20/16	¼ mile	0	No	No
State Voluntary and Brownfield Cleanup Program Sites	03/22/16	1 mile	5 (1 VCP/4 BCP)	No	No
Registered Dry Cleaners	02/11/16	½ mile	5 (+30 Historic Cleaners)	No	No
Manufactured Gas Plant Sites (Coal Gas)	N/A	1 mile	1	No	No
E-Designation Sites	04/20/16	¼ mile	6	No	No

* The surrounding area search radius indicates the radial area (measured from perimeter of the Site) for which the databases review was performed.

National Priorities Listing (NPL) – Environmental Protection Agency Superfund

The NPL is a subset of the CERCLIS and lists properties that are ranked as high priority for cleanup under the Superfund program. Neither the Site nor any other facilities within a one-mile radius of the Site are listed in the NPL database.

Delisted NPL Site List

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL when no further response is appropriate. Neither the Site nor any other facilities within a one-mile radius are listed in the delisted NPL database.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)

The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP), currently known as Superfund Enterprise Management System Archive (SEMS-ARCHIVE) Sites are also included in this database. The Site is not listed in the CERCLIS database. Three SEMS-ARCHIVE sites are listed within a ½-mile radius of the Site. Based on their distance from the Site (over 1,000 feet) and assumed hydraulic relationship, and listing details, these sites are not expected to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System - Treatment, Storage, or Disposal Facilities (RCRIS-TSD)/RCRIS Corrective Action Activity (CORRACTS)

The Resource Conservation and Recovery Act (RCRA) program identifies and tracks hazardous wastes from the point of generation to the point of disposal. The RCRIS database tracks those facilities that treat, store and/or dispose of hazardous materials as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently

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conducting, corrective action(s) as regulated under RCRA. Neither the Site nor any other facilities within the specific search radii are listed in the RCRIS-TSD or RCRIS CORRACTS databases.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)

This list includes any operation that generates or transports hazardous waste and must obtain a hazardous waste generator identification number or transporter permit. The Site is not listed on the RCRIS Gen/Trans database. Fourteen RCRA Generators/Transporters are listed within one-quarter mile of the Site, and an additional 64 facilities are listed as RCRA Non-Generators.

Based on distance from the Site assumed hydraulic gradient, and/or current regulatory status, these facilities are not expected to have affected the environmental integrity of the Site.

Federal Institutional Control/Engineering Control Registries

These registries are listings of sites with engineering and institutional controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls. Neither the Site nor any facilities located within ½-mile from the Site are listed in the Federal Institutional Control/Engineering Control Registries database.

Emergency Response Notification System (ERNS)

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed on the ERNS database.

Toxic Release Inventory System (TRIS)

TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313. Neither the Site nor any other facilities within a ¼-mile radius of the Site are listed in the TRIS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)

The New York State Inactive Hazardous Waste Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. Five SHWS facilities are listed within a one-mile radius of the Site. Based on their distance from the Site (over 2,500 feet) and assumed hydraulic relationship, these facilities are not expected to have affected the environmental integrity of the Site.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)

The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. The Site is not listed in the HSWDS database. Two facilities within a ½-mile radius of the Site

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are listed in the HSWDS database. Based on their distance (over 1,000 feet) and assumed hydraulic relationship, these facilities are not expected to have affected the environmental integrity of the Site.

Solid Waste Management Facilities (SWMF)

The SWMF database is a comprehensive listing of State permitted/recorded solid waste facilities. The Site was not listed in the SWMF database. The Site is not listed in the SWMF database. Four SWMF facilities are listed within a one-half mile radius of the Site. Based on their distances from the Site (over 1,500 feet) and assumed hydraulic relationship, these facilities are not expected to have affected the environmental integrity of the Site.

Vapor Reopened/ Vapor Intrusion Legacy Site List

New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. Neither the Site nor any other facilities within a one-mile radius of the Site are listed in the Vapor Reopened database.

New York State Spills Information Database (NY Spills)/ Leaking Storage Tanks Incidents Reports (LTANK)

The NY Spills database, including LTANKs sites, was researched to identify listings within one-half mile of the Site. The Site is not listed in the NY Spills or LTANKs database. 290 reported NY Spills/LTANK incidents (30 LTANKS and 260 Spills sites) are located within a ½-mile radius of the Site. Based on their distance from the Site, regulatory status and/or assumed hydraulic relationship, these sites are not expected to have affected the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)

The NYSDEC petroleum bulk storage (PBS) tank database was researched to identify listings for the Site and properties located within one-quarter mile from the Site. The Site address is not identified in the regulatory agency database. Twenty-eight petroleum bulk storage tank facilities are located within ¼-mile of the Site. The following site has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Sunset Gardens Senior Housing 405 44 th Street Brooklyn, NY	170 feet / south- southeast	Cross/up- gradient	10	Facility ID 2-610597. This facility is listed with one 2,000-gallon No. 4 fuel oil UST, one 550-gallon waste oil UST, and three 1,000-gallon gasoline USTs. All of the USTs were closed and removed in September and October 2006.

Based on the distance from the site, regulatory status, and/or assumed hydraulic relationship; the remaining PBS listings are not expected to impact the environmental integrity of the Site.

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New York State Voluntary and Brownfields Cleanup Program (VCP/BCP)

The NYSDEC Voluntary and Brownfields Cleanup Programs database was researched to identify listings for the Site and within a one-mile radius of the Site. The Site was not listed in the database. The database identified five VCP/BCP sites within one mile of the Site. Based on distance from the Site (over 2,000 feet) and assumed hydraulic relationship, these sites are not expected to impact the environmental integrity of the Site.

Registered Dry Cleaners

The registered dry cleaners database was researched to identify listings within one-half mile of the Site. The Site was not listed in the Dry Cleaners database. The database identified five registered dry cleaners and 30 Historic Dry Cleaners within 1/2-mile radius of the Site. The following site has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
4416 Fourth Avenue Brooklyn, NY	175 feet / south-southwest	Cross/down -gradient	12	This facility is listed as a historic dry cleaner (Lucky Coin Laundry, New Lucky Coin Laundry, and FEI DA Laundromat, Inc.) from 1999-2012. A dry cleaner was noted at this facility during the Site reconnaissance.

Based on distance from the Site and/or assumed hydraulic relationship, these facilities are not expected to impact the environmental integrity of the Site.

Manufactured Gas Plant Sites (Coal Gas)

The EDR manufactured gas plant database was researched to identify listings for the Site and within a one mile radius of the Site. The Site is not listed in the manufactured gas plant database. One site within a one-mile radius of the Site was listed in the manufactured gas plant database. Based on distance from the Site (over 3,500 feet) and assumed hydraulic relationship, it is not expected to impact the environmental integrity of the Site.

New York City E-Designation Site Listing

A hazardous materials New York City “E” designation for a property requires that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the Department of Buildings pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements). E designations can also be assigned to mitigate potential noise or air quality concerns. The Site is not listed in the E designation database. Six sites were listed in the E designation database within a 1/4-mile radius of the Site. Based on distance from the Site and assumed hydraulic relationship, these sites are not expected to impact the environmental integrity of the Site.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies. The results of the review of local records are presented below. Copies of the correspondence are included in *Appendix K*.

New York City Department of Buildings (NYCDOB)

Electronic NYCDOB records for the Site were reviewed to determine whether there were any references to buildings, tanks or other structures, property usage or inspection reports that may have indicated the presence, past use, or release of hazardous substances, wastes or petroleum products within the Site. The NYCDOB Building Information Systems electronic data included the following information:

Block 728, Lot 34:

- Two resolved Environmental Control Board (ECB) violations issued for occupancy contrary to what is allowed by the Certificate of Occupancy and non-compliance with zoning requirements. No additional violations were cited in the electronic DOB files.
- The lot has a Department of Finance Building Classification of “V0 – Vacant Land.”
- One resolved complaint issued for commercial and non-commercial vehicles parked in the lot.

Block 728, Lot 36:

- The lot has a Department of Finance Building Classification of “W9 – Educational Structure” and landmark status.
- A stop work order issued on February 12, 2009 for “debris/building – falling or in danger of falling.”
- Forty-seven Environmental Control Board (ECB) violations issued for failure to maintain the building exterior, non-compliant sidewalk sheds, expired construction permits, and abandoned operations. Twenty-one of the violations were noted as resolved.
- Twelve DOB violations issued for non-compliant sidewalk sheds, failure to correct immediately hazardous ECB violations, and general unsafe construction and building structures. Two of the violations were noted as dismissed.
- Thirty-seven complaints issued for unsafe scaffolding, sidewalk shed and building façade collapse, abandoned construction, and non-compliant sidewalk sheds. Thirty-five of the complaints were noted as resolved.

No certificates of occupancy or boiler records were included in electronic NYCDOB files for Lot 34 or Lot 36. No pertinent environmental records were noted in the electronic records.

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New York City Fire Department (FDNY)

The FDNY is responsible for the enforcement of local fire codes pertaining to the use and storage of flammable and hazardous materials. FDNY information concerning the total amount and size of removed or sealed buried motor vehicle tanks and history of buried leaks at the Site was requested in a record search form dated June 3, 2016. FDNY responded to the FOIL request indicating that after a search for available records pursuant to the information request, no tank records or history of leaks were found for the Site lots.

New York City Department of Health and Mental Hygiene (NYCDHMH)

The NYCDHMH Bureau of Environmental Investigations (BEI) maintains files of health related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDHMH information concerning the Site was requested in a FOIL letter dated June 2, 2016. An acknowledgement of the request was received from NYCDHMH on June 2, 2016. In a letter dated June 16, 2016, NYCDHMH responded to the information request indicating that no records were located within the Office of Environmental Investigations pursuant to the request. If issues of potential concern are noted upon receipt of additional information, an addendum to this report will be created to discuss relevant findings.

New York City Department of Environmental Protection (NYCDEP)

The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a FOIL form dated June 2, 2016. To date, no records from NYCDEP pertaining to the Site have been received. If issues of potential concern are noted upon receipt of returned information, an addendum to this report will be created to discuss relevant findings.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien search was performed by EDR on May 26, 2016. The lien search indicated that no environmental liens or other activity and use limitations (AULs) reported for the Site, and the current property owner was listed as Brooklyn Police Castle, Inc. (Lot 36) and Santiago Porfirio (Lot 34). A copy of the Environmental Lien search is included in Appendix J.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this Report, an addendum will be submitted to the NYCSCA.

7.3 Specialized Knowledge or Experience of the User

Mr. Matthew Mankovich of the NYCSCA IEH Division provided AKRF with the ASTM E 1527-13 User Questionnaire. No further information was available at the time of the assessment regarding any specialized NYCSCA knowledge or experience that is material to RECs/VECs/CRECs in connection with the Site. The NYCSCA is considering purchasing the Site for construction of a public school facility.

7.4 Commonly Known or Reasonably Ascertainable Information

NYCSCA was not aware of any commonly known or reasonably ascertainable information within the local community about the property that is material to RECs/VECs in connection with the Site.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination At The Property

NYCSCA was not aware of any *obvious* indicators that point to the presence or likely presence of releases at the Site.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present.

8.2 Site Reconnaissance

Visual inspection of the Site and adjacent areas was performed on June 2, 2016 by Ms. Jennifer Pensky and Ms. Neoma Chefalo of AKRF, accompanied by Mr. Matthew Mankovich of the NYCSCA. At the time of inspection, the Site buildings were in a deteriorated state and unsafe for entry; the Site was viewed from public rights-of-way and adjoining sidewalks. At the time of the inspection, the weather was sunny and approximately 80 °F, and the visibility of the Site was not obscured by weather conditions. Photographs taken during the reconnaissance are provided in Appendix C.

The Site is located at 4302-4310 Fourth Avenue and 364 43rd Street in Brooklyn, New York. The legal description of the Site is Block 728, Lots 34 and 36. The Site consists of two adjacent lots: an approximately 10,000-SF lot on the eastern portion of the Site (Lot 36) developed with a three-story building with a basement, an adjoining two-story building, and exterior vegetated areas; and an approximately 2,500-SF vacant lot on the western side of the Site (Lot 34).

At the time of inspection, the eastern portion of the Site (Lot 36) was enclosed with chain link and wooden construction fencing, with a gated, locked entrance at 4302 Fourth Avenue on its northeastern side. The two- and three-story buildings on Lot 36 were constructed prior to 1906 and were vacant at the time of inspection. Mr. Mankovich was unsure of the exact date when the buildings became vacant. A previous Phase I ESA (discussed further in Section 5.6) indicated that the three-story building had been in disrepair since a fire destroyed the interior of the building and has been vacant since at least 1999. The exteriors of the buildings are constructed of brick in a Romanesque style. The windows of the buildings have been sealed with plywood and/or concrete blocks. Interior finishes were not able to be observed due to deteriorated Site conditions. Exterior vegetated areas between the two buildings, north of the three-story building, and west of the buildings were partially covered with debris, including wood, bricks, and household trash. Evidence of trespassing and vandalism was observed throughout the eastern side of the Site, including piled litter (bottles, cans, and miscellaneous trash) and graffiti on the exterior of the buildings.

An apparent sewer vent pipe was noted along the northeastern portion of the three-story building. A small circular concrete patch was observed in the sidewalk east-adjacent to the Site on Fourth Avenue that could potentially be a former remote fill port associated with a former fuel oil tank.

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The western portion of the Site (Lot 34) was a vacant, unpaved lot with sparse vegetation. Several parked cars were observed on the lot at the time of inspection, limiting direct observation of ground cover. Piled litter, including cans, bottles, and household trash, was observed throughout the lot.

No evidence of a material release was noted on either Lot 34 or Lot 36.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owners

Lot Number	Name	Title/Company	Telephone #	Years Associated with Site
Lot 36	N/A	Brooklyn Police Castle, Inc.	N/A	1
Lot 34	Santiago Porfirio	N/A	N/A	8

The current property owners were not available for interview at the time of inspection. Mr. Matthew Mankovich of the NYCSCA answered questions during the inspection. Detailed information provided during the interview is referenced in applicable sections of this report and is documented on the Record of Communication forms in *Appendix K*.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Telephone #	Years Associated with Site
Mr. Matthew Mankovich	Industrial Hygienist/NYCSCA	718-752-5622	N/A

Mr. Mankovich answered questions during the inspection. Detailed information provided during the above-listed interview is referenced in applicable sections of this report (e.g., Sections 5.8 and 8.2).

8.3.3 Site Occupants

Name	Title/Company	Telephone #	Years Associated with Site
N/A	N/A	N/A	N/A

At the time of the reconnaissance, the Site was vacant and had no occupants.

8.3.4 Past Owners, Operators and Occupants

No prior owners or occupants were available to be interviewed.

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8.3.5 Report User

Name	Title/Company	Telephone #	Years Associated with Site
Matthew Mankovich	Industrial Hygienist/NYCSCA	718-752-5622	N/A

Mr. Mankovich indicated that the NYCSCA is considering purchasing the Site and redeveloping it for use as a public school facility. According to the ASTM E1527-13 User Questionnaire provided by Mr. Mankovich, the NYCSCA was not aware of any environmental liens, land use limitations, specialized knowledge, past uses of the Site, or obvious indicators of contamination at the Site. Detailed information provided during the above-listed interview is referenced in applicable sections of this report and a copy of the ASTM E 1527-13 User Questionnaire is included in *Appendix K*.

Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and is documented on the Record of Communication form in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

No evidence of hazardous substances or hazardous waste generation was observed at the Site at the time of the reconnaissance.

8.4.2 Petroleum Products Storage and Handling

Previous reports indicated the potential for a former fuel oil tank associated with the building on the eastern portion of the Site (Lot 36). A small circular concrete patch was noted in the sidewalk during the site reconnaissance east-adjacent to the Site on Fourth Avenue that could be a former remote fill port associated with a former fuel oil tank.

8.5 Solid Waste Generation, Storage and Disposal

General refuse, including bottles, cans, and household trash, was noted in several locations throughout the Site. Since the Site was vacant, no waste was generated at the time of the inspection.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

Based on the buildings' age (both constructed before 1906), electrical equipment, fluorescent lighting fixtures, and window caulking at the Site may contain PCBs.

8.7 Asbestos-Containing Material (ACM)

Pursuant to applicable asbestos control regulations and guidelines, AKRF considered any observed suspect materials to be asbestos-containing. The presence of suspect ACM is considered an environmental concern. The interiors of the buildings were unsafe for entry at the time of inspection; limited interior building materials were visible through window openings. Based on the age of the buildings, asbestos-containing materials may be present within interior/exterior building materials and/or within buried demolition debris from former on-site structures. The building materials were observed to be in damaged condition.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, a limited visual assessment of accessible painted surfaces was performed. No sampling or intrusive work was performed, as this is outside the scope of this Phase I ESA Update. In accordance with NYCSCA's current interior LBP Inspection protocol, all painted interior surfaces are assumed to be LBP. For this Site, the limited visible interior/exterior painted surfaces were generally found to be in fair to poor condition. Any interior paint that is damaged or in disrepair, or that may be disturbed in any way during construction activities, must be handled in accordance with NYCSCA policies and procedures. Any construction work that may disturb these painted surfaces should be inspected, and tested as appropriate, in accordance with NYCSCA's current exterior LBP policies and procedures. The potential presence of LBP is considered an environmental concern.

8.9 Regulatory Compliance

The interior conditions in both buildings rendered them unsafe for entry. Both buildings require sustained security and engineering measures to ensure public safety, including construction fencing with a locked gate around the perimeter of the Site, a covered pedestrian walkway on Fourth Avenue, and sealed windows and doors. No regulatory compliance issues related to hazardous materials were noted from the surrounding rights-of-way during the Site reconnaissance.

8.10 Electromagnetic Fields

No evidence of high voltage lines or substations was observed in close proximity to the Site during the reconnaissance, and no high-voltage lines were identified in close proximity to the Site in the regulatory database report provided by EDR.

8.11 Other Environmental Conditions (Methane, Mold, etc.)

No visual evidence of mold growth was observed at the Site from public rights of way. No visual evidence of additional bio-hazardous waste was observed at the Site, and Mr. Mankovich was unaware of any historical on-Site uses that would generate such wastes. Based on a review of historic maps, the Site does not appear to be in an area of buried wetlands or other potential methane-generating deposits; therefore, methane is not anticipated to represent an environmental concern.

9.0 SUMMARY OF FINDINGS

This report summarizes the findings of the Phase I Environmental Site Assessment (ESA) Update of the property located at 4302-4310 Fourth Avenue and 364 43rd Street, Queens, New York 11232 (the "Site"). The legal description of the Site is New York City Borough of Queens Tax Block 728, Lots 34 and 36.

The Site consists of two adjacent lots: an approximately 10,000-square foot (SF) lot on the eastern portion of the Site (Lot 36) developed with a vacant, three-story building with a basement and an adjoining vacant two-story building with exterior landscaped areas; and an approximately 2,500-SF vacant lot on the western portion of the Site (Lot 34) used for surface parking. The NYCSCA is considering purchasing the Site for redevelopment and use as a public school facility. The Site is abutted to the north by 43rd Street, followed by former St. Michael's School (currently P.S. 516) and St. Michael's Church. The Site is abutted to the south by residential structures with street-level retail establishments, including restaurants and convenience stores. The Site is abutted to the west by residential structures. Fourth Avenue abuts the Site to the east, followed by residential structures (including a senior housing facility) with street-level retail establishments, including a deli and a hair salon, and a municipal/NYPD office building to the northeast. Neither the Site nor adjacent properties contain Hazardous Materials "E" Designations. The Site does not contain a "D" Restrictive Declaration.

According to the United States Geological Survey (USGS.) 7.5-Minute Quadrangle Map, Jersey City, New York-New Jersey, dated 2014, the elevation of the Site is approximately 65 feet above the National Geodetic Vertical Datum of 1929 (an approximation of mean sea level). The topography of the immediate Site area was observed to slope moderately downward to the west. According to Reconnaissance of the Ground Water Resources of Kings and Queens Counties, New York; USGS, bedrock is approximately 250 feet below grade in the vicinity of the Site. The crystalline bedrock is overlain, in sequence, by Raritan Formation clay, Gardiners Clay, and Upper Pleistocene deposits of the Wisconsin Glaciation. Previous subsurface investigations conducted at the Site indicated that groundwater was encountered between approximately 30 and 37 feet bgs

Visual inspection of the Site and adjacent areas was performed on June 2, 2016 by Ms. Jennifer Pensky and Ms. Neoma Chevalo of AKRF, accompanied by Mr. Matthew Mankovich of the NYCSCA. At the time of inspection, the Site buildings were unsafe for entry and the Site was viewed from public rights-of-way. At the time of the inspection, the weather was sunny and approximately 80 °F, and the visibility of the Site was not obscured by weather conditions.

During the Site inspection, a small circular concrete patch was noted in the sidewalk east-adjacent to the Site on Fourth Avenue that could be associated with a former fuel oil tank. Two dry cleaners were observed one block south of the Site during the Site reconnaissance, at 4402 Fourth Avenue and 4416 Fourth Avenue. No chemicals or hazardous materials were observed to be currently stored at the Site. No evidence of a current or ongoing material release was noted in any of the inspected areas.

Suspect ACMs could be present within building components and/or buried demolition debris from former structures. Based on the age of the structures (both constructed before 1906), electrical equipment, fluorescent lighting fixtures, and window caulking at the Site may contain PCBs. PCBs could also be present within buried demolition debris from former on-site structures. Lead based paint could be present at the Site within building components and/or buried demolition debris from former structures.

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Historical Sanborn maps and city directories identified a two-story auto garage located on-Site on the 1926 to 1970 Sanborn maps (Lot 36) and two former dwellings (Lot 34). Potential buried demolition debris/fill material from former on-site structures and/or USTs could be present beneath the Site.

Historical Sanborn maps, city directories, prior reports and the regulatory database review identified several former industrial/auto-related facilities and drycleaners on the blocks surrounding the Site, including: a paper manufacturer (subsequently an embroidery works/manufacturer) located one block south (Block 737) on the 1906 Sanborn map; a printer located south of the Site on the Site block on the 1951 to 2007 Sanborn maps with a hand laundry noted at this address in city directories (subsequently a sign shop); a launderette identified on the 1965 through 1992 directories on the south-adjacent block (listed as a historical drycleaners in the regulatory database) and a second drycleaner noted on this block in previous reports and during the site reconnaissance; a gasoline filling station located on the east-adjacent block (Block 729) on the 1926 through 1951 maps; a cluster of 15 auto garages located east-adjacent to the filling station on the 1926 Sanborn map; and an auto repair shop, a radio parts manufacturer mapped east-adjacent to the filling station on the 1951 Sanborn map (this facility was also listed as a petroleum bulk storage facility in the regulatory database).

Previous Phase I Environmental Site Assessments (ESAs) were conducted in 2010 for the Site lots by Langan Engineering and Environmental Services, P.C (Langan). The Phase I ESAs identified on-site recognized environmental conditions (RECs) related to a potential fuel oil storage tank and potential historic use as an automotive garage on Lot 36 and off-Site RECs including nearby historical petroleum storage tanks, dry cleaning facilities, and historical industrial/automotive uses, including a gasoline filling station, a radio parts manufacturing facility, a metals company, a paper ornament and embroidery manufacturing facility, and automobile repair facilities.

Based on the findings of the 2010 ESAs, Langan completed a Phase II Environmental Site Investigation on the Site lots that included the advancement of soil borings with the collection of soil, groundwater and soil vapor samples for laboratory analysis. The analytical results of Langan's investigations indicated VOCs at levels below the Unrestricted Use SCOs and select SVOCs and metals at concentrations above their Unrestricted Use SCOs including lead at one sample location (Lot 34) and chromium at one sample location (Lot 36) that were noted to be attributable to fill materials (no other metals were detected at concentrations exceeding the SCOs). Groundwater analytical results for both lots indicated VOCs and metals below their respective NYSDEC AWQS values; SVOCs and PCBs were not detected in the groundwater samples. Soil vapor analytical results indicated an elevated detection of TCE in a sub-slab vapor point collected on Lot 36 at a concentration of 7.1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), above the NYSDOH AGV of 5 $\mu\text{g}/\text{m}^3$ (the guideline used at that time, the current AGV is 2 $\mu\text{g}/\text{m}^3$). PCE was detected in five soil vapor samples on Lot 36 at concentrations between 39 and 57 $\mu\text{g}/\text{m}^3$ and two samples collected from Lot 34 at concentrations between 78 and 90 $\mu\text{g}/\text{m}^3$ (above the current 30 $\mu\text{g}/\text{m}^3$ AGV). Additionally, certain VOCs were detected at concentrations greater than their respective indoor background levels.

Based on the findings of the Phase II ESIs, Langan recommended a vapor barrier and an active SSDS be integrated into the proposed new school, additional characterization of soil prior to excavation and proper management/disposal of any petroleum storage tanks (and any petroleum-contaminated soil) encountered during redevelopment, and proper management/disposal of potential ACM, LBP and suspected PCB-containing materials. Langan noted that construction dewatering, if required, should be performed in accordance with applicable local, state and federal regulations. Based on the results of preliminary design sampling it was noted that excess soil generated during the proposed construction should be classified as

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nonhazardous material. Langan noted that any post-construction exposed soil (landscaped areas) should be covered with at least two feet of environmentally clean fill meeting the requirements of Part 375 for unrestricted use.

10.0 CONCLUSIONS AND RECOMMENDATIONS

AKRF has performed a Phase I ESA Update in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCSCA. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

Summary of RECs, VECs and Environmental Concerns

On-Site REC/VECs:

- Results of a 2010 Phase II Environmental Site Investigation which indicated elevated detections of TCE and PCE above the current NYSDOH AGVs.
- A suspect former fuel oil fill port located on the east-adjacent sidewalk on Fourth Avenue (Lot 36) which may have been associated with an on-site fuel oil storage tank.
- Potential former automotive repair activities associated with an automobile storage garage in the two-story building on Lot 36 (noted on 1926-1970 Sanborn Maps).
- Potential buried debris associated with demolition of historic on-site structures could include USTs and/or historic fill material of unknown origin.

Off-Site RECs/VECs:

- Two dry cleaners located on the south-adjacent block at 4402 Fourth Avenue and 4416 Fourth Avenue (also identified in the historic cleaners database). Potential releases of dry cleaning solvents from these facilities could have affected the Site subsurface.
- Various historic manufacturing and industrial uses on the surrounding properties, including: a printer (and subsequent sign shop and laundry) south of the Site at 4324 Fourth Avenue (1951-2007 Sanborn maps, 1945-1980 City Directories); a paper manufacturer (1906 Sanborn map) and lace and embroidery works/manufacturer (1926-1951 Sanborn maps) south of the Site at 366 44th Street; and a radio parts manufacturer east of the Site at 405 44th Street (1951 Sanborn map, also listed as a petroleum bulk storage facility in the regulatory database).
- Historical automotive uses on the east-adjacent block, including: a gasoline service station with four gasoline tanks at 4313-4323 Fourth Avenue (1926-1951 Sanborn maps); a cluster of 15 auto garages at 405-411 44th Street (1926 Sanborn map); and an automotive sales and service shop with a fuel tank at 423 44th Street (1951-2004 Sanborn maps).
- Multiple industrial facilities, including Delloy Metals and Continental Cutter Supply in the 1945 City Directory, and Empire Tool Company in the 1949 City Directory, located south-adjacent to the Site at 4314 Fourth Avenue.

This Phase I ESA Update has revealed the following environmental concerns associated with the Site:

- Potential suspect ACM and LBP in the buildings and/or buried demolition debris.
- Potential PCB-containing electrical fixtures, light ballasts, and/or window caulking and/or buried demolition debris.

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Recommendations

The RECs/VECs identified in this ESA are generally consistent with the findings of Langan's 2010 Phase I ESAs (no new RECs were identified). AKRF concludes that the RECs were adequately investigated during Langan's 2010 Phase II ESIs, with appropriate recommendations made for procedures to be implemented during redevelopment. Based on the findings of the Phase I ESA Update, no additional subsurface investigations are recommended at this time. AKRF agrees with the recommendations of the previous investigations, which included:

The installation of an active sub-slab depressurization system (SSDS) and soil vapor barrier; proper characterization, handling, and disposal of soil excavated during school construction; proper closure/removal of any underground or aboveground petroleum storage tanks (and any petroleum-contaminated soil) in accordance with applicable regulations; minimizing dewatering to prevent potential migration of contamination onto the site from off-site sources, and proper discharge of any dewatering fluids during construction; and, placement of a minimum of two feet of environmentally clean fill over exposed soil in landscaped areas within the Site. In addition, any suspect ACM, LBP, and PCB-containing materials should be properly managed during construction or renovation activities.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

AKRF Engineering, P.C. (AKRF) has performed a Phase I ESA Update of the 4302-4310 Fourth Avenue and 364 43rd Street Site (the "Site") in Brooklyn, NY. The scope of the Phase I ESA Update was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCSCA. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA Update are provided below. Qualifications for these individuals are provided in *Appendix I*. AKRF declares that to the best of their professional knowledge and belief, they meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. AKRF has the specific qualifications based on education, training and experience to assess the subject property. AKRF has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



PREPARED BY: _____

Neoma Chefalo
Associate Environmental Scientist
ENVIRONMENTAL PROFESSIONAL



REVIEWED BY: _____

Michelle Lapin, P.E.
President
QA/QC OFFICER



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Senior Technical Director
PROJECT MANAGER

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12.0 REFERENCES

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**PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE
PROPOSED PUBLIC SCHOOL FACILITY (K15D)
4302-4310 FOURTH AVENUE AND 364 43RD STREET
BROOKLYN, NY 11232**

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13.0 APPENDICES

- Appendix A - Site Location Map**
- Appendix B - Site Plan**
- Appendix C - Site Photographs**
- Appendix D - New York State Wetlands Map**
- Appendix E - FEMA Flood Insurance Rate Map**
- Appendix F - Historical Topographic Maps**
- Appendix G - Historical Aerial Photographs**
- Appendix H - Sanborn Fire Insurance Maps**
- Appendix I - Regulatory Agency Database Report**
- Appendix J - Prior Reports/ Supporting Documents**
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