A. INTRODUCTION

A hazardous material is any substance that poses a threat to human health or the environment. Substances that can be of concern include, but are not limited to, heavy metals, volatile and semi volatile organic compounds, methane, polychlorinated biphenyls, and hazardous wastes (defined as substances that are chemically reactive, ignitable, corrosive, or toxic). According to the *City Environmental Quality Review (CEQR) Technical Manual*, the potential for significant adverse impacts from hazardous materials can occur when: a) hazardous materials exist on a site and b) an action would increase pathways to their exposure; or c) an action would introduce new activities or processes using hazardous materials.

This chapter evaluates the potential for hazardous contaminants on the project site in soil and groundwater resulting from previous and existing uses to impact the proposed Police Academy development. The project site and surrounding area currently and historically have been used for at-grade parking, commercial, manufacturing, institutional, transportation-related, and automotive-related uses. The project site consists of three distinct parts: the NYPD's College Point Tow Pound, a vacant lot that runs along College Point Boulevard and forms the Tow Pound's western boundary, and a vehicle service station that is located at the northwest corner of the site (at the southeast corner of College Point Boulevard and 28th Avenue). This chapter summarizes the investigations that have been undertaken to date with respect to hazardous materials, their conclusions, and the potential for significant adverse impacts under the CEQR.

To identify the potential for the presence of hazardous materials and contaminated media on the project site, Phase I Environmental Site Assessments (ESA) were prepared in February 2007 and January 2008 in accordance with the scope and limitations of ASTM Standard Practice E 1527-05 that included the following:[1]

- An evaluation of the land use history, using available historical fire insurance maps, topographic maps, and historical aerial photographs, as well as tenant searches;
- A review of land title records, environmental liens, and/or activity and use limitations;
- A review of existing data on geology and hydrology of the area;
- A visual inspection of the project site and a visual inspection of adjacent properties;
- Interviews with persons knowledgeable about the project site; and
- A review of federal and state environmental regulatory agency databases regarding releases or spills of potentially hazardous materials, facilities that emit hazardous materials to the air or the sewer system, and facilities that generate, treat, or store hazardous wastes.

The Phase I ESA concluded that there is potential for encountering hazardous materials at the project site, and recommended conducting a Phase II Environmental Site Investigation (Phase II ESI) to determine whether identified *recognized environmental conditions* have impacted the environmental integrity of the project site. Subsequently, a Limited Phase II ESI was prepared in March 2007 for the

[1] LiRo Engineers, Inc., *Phase I Environmental Site Assessment- Police Impoundment Area,* February 23, 2007; and, LiRo Engineers, Inc., *Phase I Environmental Site Assessment- NYPD Academy: Crystal Windows & Corona Auto and Truck Site*, January 31, 2008.
As the original boundaries of the proposed development site have changed since the project originally started, two Phase I ESA reports were prepared so that the entire final site boundaries were adequately studied.

Tow Pound portion of the site and a second Limited Phase II ESI was prepared in May 2008 for the vehicle service station and the vacant land along College Point Boulevard that assessed whether the identified *recognized environmental conditions* identified in the Phase I ESAs have the potential to impact the proposed development.[2] The Phase II ESIs summarize the results of the field investigation work and review the analytical results compared to their applicable standards and guidance values to evaluate environmental impacts, if any, to the project site. Summaries of the Phase I ESA, and Phase II ESI have been incorporated into the Existing Conditions section below.

B. EXISTING CONDITIONS

Project Site Location and Current Conditions

The proposed Academy site is located in northern Queens on the block bounded by 28th Avenue, Ulmer Street, 31st Avenue and College Point Boulevard (see Figure 7-1). The directly affected area ("site" or "proposed development site"), located in the College Point section of Queens, encompasses approximately 35 acres and consists of the following parcels: Block 4321, Lot 48; Block 4323, Lot 19; Block 4324, Lot 1; Block, 4325 Lot 1; Block 4326, Lot 1; Block 4327, part of Lot 1; Block 4328, part of Lot 1; Block 4329, Lots 1, 7, 10 and 75; Block 4301, part of Lot 1; Block 4359, part of Lot 1; Block 4358, part of Lot 1; Block 4357, part of Lot 1; Block 4356, part of Lot 30; and Block 4354, Lot 50.

As described in Chapter 1, "Project Description," an exposed drainage ditch (part tidal and part freshwater) in the shape of an inverted "L" bisects the proposed Academy site, separating the eastern third from the western two thirds of the site. The drainage ditch originates in the northeastern section of the proposed Academy site where two 84-inch storm sewers discharge drainage from offsite. The northern and central sections of the ditch are connected via two 84-inch culverts beneath the northern bridge. These culverts have tide gates constructed on the downstream end, limiting tidal flow to the central and southern sections of the ditch. The ditch ultimately drains offsite to the south via three 72-inch pipes located at the southern boundary at 31st Avenue. The structure provides drainage for upland areas of College Point via culverts to Flushing Bay to the south, emptying near the Whitestone Expressway (approximately 700 feet south of the proposed Academy site). The drainage structure was constructed by the NYC EDC in the early 1980's. The tide gates were recently replaced by NYC EDC.

The proposed development site consists predominantly of paved parking areas. Current buildings at the College Point Tow Pound include the two-story, approximately 17,000 square-foot main administrative building/garage at the 31st Avenue entrance and an outlying building, a one-story, approximately 1,125 square-foot structure which is located near its secondary access along Ulmer Street at the northeastern edge of the property. The southern five acres of the existing Tow Pound, including the main administrative building/garage, is located to the south of the proposed Academy's southern property line. As such, the main building is not located within the limits of the proposed Academy site.

The approximately 35-acre northern parcel, consisting of the service station parcel, the strip of land between the College Point Tow Pound and College Point Boulevard, would be developed as the Police Academy.

Currently, a majority of the Site is an impoundment area used by the NYPD, which contains approximately 3,000 vehicles, 1,300 motorcycles and 600 auto parts on a paved asphalt lot. All of the

[2] LiRo Engineers, Inc., *Limited Phase II ESI - Police Impoundment Area*, March 2007; and *Limited Phase II ESI – Crystal Windows and Corona Auto and Truck Site*, May 2008.

vehicles, motorcycles and auto parts will be relocated to other City-owned sites throughout the City as the NYPD consolidates several existing Tow Pound Facilities and reorganizes its citywide operations.

Surrounding Area Description

The proposed Academy site is located in the area immediately to the north / west of the Whitestone Expressway. This area is a mixed commercial and industrial zone, which consists of mostly manufacturing, and industrial uses, with various commercial uses mixed in. Further from the proposed development site, commercial and residential uses become more prevalent. The immediate area is typically urban with limited vegetation.

The MTA Bus College Point Depot is located directly to the north of the proposed development site located at 128-15 28th Avenue within the 400-foot study area. The College Point Depot, located on 28th Avenue near 124th Street in the College Point neighborhood of Queens, is a bus garage owned by the NYCDOT and leased to MTA Bus, and formerly leased to Queens Surface Corporation before it was taken over by MTA Bus. The facility comprises the majority of the block bounded by 28th Avenue, Ulmer Street, 26th Avenue, and 124th Street. This block also accommodates several residential units at the intersection of 124th Street and 26th Avenue. Several assisted care facilities are located along the waterfront to the northeast of the site. College Point Boulevard, as it proceeds north, changes character, with low intensity commercial giving way to mixed commercial and residential, which culminates in the commercial district of College Point and the charming town center.

The 78-acre former Flushing Airport is located approximately 0.3 miles northeast, at 25th Avenue and Linden Place. Flushing Airport opened in 1927 and was used until 1984. The frequent flooding problem at the Flushing Airport lead to the close of this airport in 1984. Currently the airport is a weed-ridden wetland. The airport was one of the busiest airports in New York City before the emergence of the larger LaGuardia Airport. LaGuardia Airport is located approximately 0.6 miles west of the site, across Flushing Bay.

A variety of commercial uses are located to the east/southeast of the site, within the Study Area. A commercial complex, which includes a multiplex cinema and two big-box retail establishments, is located to the east of Ulmer Street on the block bounded by Ulmer Street, 28th Avenue, Linden Place, and the southbound Whitestone Expressway Service Road. A construction company is located to the northeast of the Ulmer Street and 28th Avenue intersection. Immediately to the north of this building, is a satellite/overflow parking lot for the local movie theater. A local open space resource, the College Point Sports Park, is located to the north of this parking lot.

To the south of the site, on the project block, several commercial uses and a church are located to the east of the exposed drainage channel. The Department of Motor Vehicles has an office located within this plaza.

Crystal Windows, a window and door manufacturer is located on the block immediately to the south of 31st Avenue. A self-storage facility, a car wash, and several other manufacturing uses are also located on this block. Uses further to the south, west of College Point Boulevard and south of 31st Avenue, include a Home Depot, a concrete plant, and several other light-manufacturing and industrial uses. Additionally, construction of a new 82,000 sq. ft. building for Ares Printing and Packaging has begun on the property at the southwest corner of the 31st Avenue and College Point Boulevard intersection.

A hotel is located immediately to the west of the proposed development site. Other predominant uses to the southwest/west of the site include a New York City Department of Sanitation facility, including a marine transfer station, a ConEd facility, a Daily News printing facility, an asphalt plant, a heavy equipment/machine rental company and a variety of other manufacturing and industrial uses.

The waterfront in the vicinity of the site is industrial and largely inaccessible; however, the Williamsburgh Marina is located on Flushing Bay, to the north of the Department of Sanitation marine transfer facility.

Project Site History

Historical information about the proposed development site was obtained from aerial photographs (1954, 1966, 1975, 1984, and 1994) and topographic maps (1897, 1947, 1955, 1966, 1979, and 1995), and the Property Clerk's Division. According to these sources, the proposed development site was located within a tidal marsh from 1897 up until at least 1947.

Topographic maps from 1947 continue to show wetlands, however, the presence of structures to the south of the proposed development site suggest that some marsh filling was underway in this area of College Point. The 1947 map continues to show an inlet from the Flushing River, which is located along the eastern edge of the site, and some of the surrounding area has been developed. In addition, the Whitestone Expressway has been constructed southeast of the site. Flushing Airport is shown as a wetland located west of the Whitestone Expressway and north of 20th Avenue. La Guardia Field is located west of the site, across Flushing Bay. An incinerator is shown approximately 350 feet southeast of the site.

The 1954 aerial photo and 1955 topographic map suggest that more of the marsh area had been at least partially filled. The 1955 map shows that Flushing Creek (formerly Flushing River) is no longer mapped through the site. Mill Creek is located immediately east of the site. Flushing Airport is also completely filled and located south of 20th Avenue between Linden Place and Whitestone Parkway. A playground is located near Flushing Airport, north of 20th Avenue. New York Municipal Airport on La Guardia Field is located west of the site across Flushing Bay. A US Military Reserve Base is located at the southern end of 130th Street, northeast of the site. In addition, the 1954 aerial photo shows an incinerator to the southeast of the site. A coal and oil company is also shown approximately one block southwest of the site.

The 1966 topographic map shows the site has remained largely unchanged from the 1954 map, with slight changes to adjacent properties. The New York Municipal Airport is referred to as La Guardia Airport. The playground north of 20th Avenue and the US Military Reserve Base both no longer exist.

In the 1979 and 1995 maps, the site has remained the same. The bus depot immediately north of the site first appears in the 1979 map. The aerial photograph of 1975 shows clearance of the northern and southern portions of the site. In the 1984 photograph, the site remains generally the same; with the addition of a retention pond located along the eastern portion of the police impound lot from 31st Avenue north to 28th Avenue. An inlet from the creek east of the site feeds into the retention pond. The 1994 photograph shows minor changes to a building, which is no longer present, 400 feet south of the auto repair shop.

The proposed development site was filled prior to 1972 to an elevation near its current grade, an elevation of approximately 10 feet above mean sea level (amsl). The thickness of fill in the immediate area was found to be as much as 20 feet. Subsequent filling of the proposed development site occurred in the 1980s based on the appearance of the drainage basin at the eastern edge of the site in the 1984 aerial photo. According to the NYPD, the College Point Tow Pound was established in 1991.

Geology and Hydrogeology

Physiographically, Kings and Queens Counties are part of the Long Island Hydrogeologic System. In a roughly north-south cross section, the geology can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene age unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within these sediments, generally creating three distinct aquifers. Groundwater is the sole source of drinking water for Nassau and Suffolk Counties and is protected as such in Kings and Queens Counties. Consolidated bedrock is of Precambrian and Paleozoic age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface from north to south. Outcrops of metamorphic bedrock can be found along the northwest portions of Queens County. The uppermost-unconsolidated unit consists of Pleistocene glacial till and moraine deposits in the northern portions of the Queens and Kings Counties and glaciofluvial sediments derived from melt-water of the retreating glaciers to the south. These deposits constitute the Upper Glacial Aquifer. The depth to the water table varies but generally follows topography with flow from higher to lower elevation. In areas of higher topography associated with glacial moraine deposits, the water table is as great as 100 feet below sea level. Closer to sea level, groundwater can occur at depths of 5 to 10 feet below sea level. The terminal moraine deposits act as a groundwater divide with regional flow to the north, north of the moraine and o the south, south of the moraine.

The overlying Cretaceous age sediments are characterized by three periods of deposition separated by periods of erosions. The lowermost unit, known as the Raritan Formation, was deposited by streams and coalescing delta deposits. The formation has been divided into two units, the Lloyd Sand Member and a conformable overlying clay unit (the Raritan Confining Unit).

After the period of erosion, the Magothy Formation was deposited in an environment dominated by streams and coalescing deltas. The coarse basal unit indicates an environment of high energy that decreases rapidly, resulting in deposition of finer sands and silts that make up the majority of the formation.

Several episodes of Pleistocene glaciations by a southward advance from New England and the Hudson River valley eroded the Cretaceous deposits. The unconformity that extends across most of Queens and Kings Counties between the Cretaceous deposits and the overlying sediment represents glacial scouring and glaciofluvial activity. Evidence of ice contact with the underlying Cretaceous deposits is absent in the southern portion of Queens and Kings Counties, indicating the southernmost limit of the advancing ice sheets.

The oldest Pleistocene deposit, represented only on western Long Island and in Queens and Kings Counties is the Jameco Gravel (Jameco Aquifer). It is a channel filling of gravel and coarse sands, which may represent a paleo Hudson River.

The Harbor Hill Moraine represents the terminal moraine of the last glacial advance. The Moraine trends southwest to northeast through central Kings and Queens Counties. The moraine deposits consist of poorly sorted silts, clays, sands and boulders and form the topographic highs in the area.

Soil samples were screened and described in the field by a LiRo geologist. The soils encountered were described at all locations as re-graded or fill consisting of multi-colored sand and gravel with some clay, brick, concrete, wood and asphalt fragments, plastic and glass. The depth of fill ranged from 16 feet to 32 feet below grade (ftbg). Bedrock was not encountered. Native soil beneath the fill was described as gray/green/black silty clay at all locations across the site. These soils are consistent with the description of tidal marsh deposits. Based on historical documents, these deposits are a minimum of ninety (90) feet, thereby, occurring as natural barrier to downward contaminant migration.

During recent drilling activities at the adjacent property, groundwater was encountered at depths ranging from 9 to 14 ftbgs. Based on reports of previous investigations performed at the site, the groundwater flow direction is likely south/southeast.

Recognized Environmental Conditions (RECs)

Phase I ESA Report – Police Impoundment Area (LiRo 2007)
A Phase I Environmental Site Assessment (ESA) was performed by LiRo dated February 23, 2007 in accordance with the American Society for Testing Materials (ASTM) practice E-1527-05 Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process. Based on the Results of his Phase I ESA, LiRo identified the following RECs and potential environmental concerns.

- The current use of the site as a motor vehicle impoundment area where thousands of vehicles are stored on the site indicates the potential for petroleum release into the soil or groundwater. The Police Impoundment Area was reportedly established in 1991.

- Much of the site is a mapped federal wetland. However, U.S. Fish and Wildlife Service provided a verbal response to a letter commenting that based on site conditions; the site is not characteristic of a wetland. U.S. Fish and Wildlife Service informed LiRo that the U.S. Army Corps of Engineers (USACE) has jurisdiction over wetland protection and advised us to contact them for additional information. After the Phase I ESA was submitted, USACE contacted LiRo in reference to the listing of the site on the National Wetlands Inventory (NWI). According to both agencies, the NWI is not used to designate wetlands for regulatory purposes. It is only a general guide to areas that might involve wetland protection. Wetland delineation was subsequently performed and the findings are presented in Chapter 5, "Natural Resources."

- Based on historical information obtained form aerial photographs and topographic maps, site information obtained from Property Clerk Division, the site was initially filled into the 1940's and subsequently filled into the late 1940's/early 1950's, 1980's, and 1990's. According to previous investigations, the site was filled prior to 1972 to an elevation near its current grade. The fill reportedly included demolition debris, incinerator waste products, building construction excavation material, scrap metal and other types of miscellaneous debris. The thickness of fill in the area was found to be as much as 20 feet. Based on historic filling of the site, elevated levels of semi volatile organic compounds, metals and PCBs in soil and groundwater are likely.

- Additional facilities that represent an environmental concern to the site include the following three properties: MTA Bus Company's College Point Bus Facility, which is located at 124-15 – 128-15 28th Avenue (immediately north of site), the Corona Auto Repair, which is located at 128-11 College Point Boulevard (the northwest corner of the site) and Coastal Oil, which is located at 31-70 College Point Boulevard (0.09 mile southwest of site). All these properties have a history of petroleum bulk releases, hazardous waste generation of ignitable, tetrachloroethylene and benzene related waste and are located near the site. As a result, these facilities may be contributing sources to potential site soil and/or groundwater contamination.

- The historic land use and locations of the surrounding properties listed below may be a contributing source to potential soil and/or groundwater contamination.

    - The former Flushing Incinerator is located 350 feet southeast of the site. The property is identified on historical records from 1943-2004. The incinerator site is currently occupied by a

self-storage facility. Based on its proximity and potential contaminants associated with incinerator facility, such as metals and PAHs, this property is a potential environmental concern to the site.

- A coal and oil company (Fuel Oil Storage Terminal) containing oil tanks totaling 2,880,000 gallons was located approximately 1 block southwest from the site. The property is identified on historical records from 1943 – 2004. The facility is currently active. Based on its close proximity and potential petroleum release, this property is a potential environmental concern to the site.

- The former Flushing Airport is located approximately 0.3 miles northeast at 25th Avenue and Linden Place. The facility is identified on historical records from 1943-2004. The airport is currently inactive. Based on its upgradient location and potential petroleum release, this property is a potential environmental concern to the site.

- Based on the findings of the Phase I ESA, LiRo recommended further investigation (i.e., a Phase II report) to evaluate contamination associated with aforementioned RECs.

Phase I Environmental Site Assessment for Crystal Windows and Corona Auto and Truck Site (January 31, 2008)
Based on the information and data obtained during the Phase I ESA, LiRo developed the following conclusions regarding RECs and environmental concerns at the site.

- The Corona Auto and Truck portion of the site is impaired with petroleum contaminants. This is a REC as site remediation is on going. LiRo recommends that the status of and future responsibility for site remediation should be determined.

- The Crystal Windows portion of the site (the vacant strip of land that runs parallel to College Point Boulevard, which had previously been studied as a possible expansion site for Crystal Windows) was studied in 2003 with significant limitation. The results indicated petroleum impacts as well as PCBs in the site soil. However, only four borings were conducted and soil samples were not analyzed for metals or pesticides. Petroleum impacts from Corona Auto and Truck, the use of historic fill, and potential impacts from off-site sources are RECs for the Crystal Windows portion of the site.

- Previous sampling at the Corona Auto and Truck portion of the site has been limited to petroleum related organic compounds. No testing for metals, pesticides or PCBs has been conducted.

- Based on the age of the previous Phase II study for Crystal Windows and the limited scope of investigations at Crystal Windows and Corona Auto and Truck, LiRo recommended that a Phase II Investigation be conducted to more fully characterize current soil and groundwater conditions.

Based on the age of the abovementioned findings, it was determined that a Phase II Investigation was warranted to more fully characterize current soil and groundwater conditions at the site.

Hazardous Building Materials

Based on the age and appearance of the site buildings, the Phase I reports indicate that suspect asbestos containing materials and lead-based paint (LBP) may be present. Other than the fuel and oil in the vehicles stored at the site, there were no hazardous substances or petroleum products used in connection with operation of the impound lot.

Subsequent Environmental Studies

Phase II Environmental Site Investigation

Site Investigation and Subsurface Conditions – College Point Industrial Park (December 1977)
A geotechnical investigation that included test borings was conducted in this area to determine subsurface conditions for use as the basis for planning the overall development of the College Point Industrial Park. Several test borings were completed at the site. Subsurface conditions at the site consisted of brown to black fine to coarse sand, silty sand, gravel, brick, concrete, wood and cinders down to 20 feet.

According to the investigation, the strata identified resulted from the site being filled with a variety of items, possibly including: demolition debris, incinerator waste products, building construction excavation material, scrap metal, and other types of miscellaneous debris prior to 1972 to an elevation near its current grade. After 1972, the site was included in the "Early Fill Program" where fill included sand and gravel with some small boulders. According to the investigation, areas of the College Point Industrial site were used as a public dump, often illegally.

The area north of 20th Avenue, between 138th and 134th Streets, was the official City household dump. In this site, miscellaneous fill consists of gravel, cinders, sand, silt and household materials. During the boring program the thickness of this fill was found to be an average of 14 feet. The official City household dump was located approximately 0.65 miles northeast of the site.

ASTM Phase II Environmental Site Assessment – Undeveloped Parcel of Land, College Point Boulevard (November 2003)
Aneptek Corporation completed a Phase I report for the parcel between the Tow Pound Lot and College Point Boulevard (often referred to as the "Crystal Windows site") in June 2003. The report examined the potential for evidence indicating the presence of and/or potential for impact to the site soils and/or groundwater by oil or hazardous material from on-site and/or off-site contamination sources.

Subsequent soil test boring and groundwater monitoring wells were installed for laboratory analysis of soil and groundwater samples. The laboratory results showed that soil/fill material contained low levels of petroleum compounds, including Gasoline Range Organics/Diesel Range Organics (GRO/DRO), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), heavy metals and polychlorinated bi-phenyls (PCBs). PCBs in the soil ranged from 0.04 ppm to 0.32 ppm. The groundwater contained trace to elevated levels of petroleum compounds (including GRO/DRO), VOCs, SVOCs, and heavy metals.

Based on evaluation of laboratory analytical results and observations made during the subsurface investigation, the Aneptek report concluded that a mixed plume of gasoline and diesel fuel was present near 28th Avenue and College Point Boulevard. The plume was thought to be migrating in a southerly to southeasterly direction. The source of this petroleum plume was thought to be historical petroleum spills at the Corona Auto Repair site. An additional plume was identified near 31st Avenue and College Point Boulevard. The source of this plume is most likely from a historic undocumented petroleum release.

Quarterly Monitoring Report – Corona Auto Repair, EDC (July 2007)
LiRo reviewed a Quarterly Monitoring Report completed in July 2007 for the Corona Auto and Truck site. The recommended remedial approach for the subject site included a combination of bioremediation and Oxygen-Release Compound (ORC) injections to treat soil and groundwater

contamination and using a vacuum Enhanced Fluid Recovery (EFR) truck to collect free product. The New York State Department of Environmental Conservation (NYSDEC) approved the remedial approach in March 2002. Construction of the system started and ended in March 2003.

Using the NYSDEC-approved remedial approach, free product has been removed and groundwater contaminant levels reduced across much of the Corona Auto and Truck site. Relatively high dissolved phase VOC levels persisted along the western margin of the site. Based on the results from supplemental borings completed in 2004, soil contamination exists along the College Point Boulevard sidewalk and may be acting as a continuing source of groundwater contamination at the Corona Auto and Truck site. Therefore, remediation continued through the use of Bio-Rem LLC's H-10 product. The injection was completed December 2, 2005. The quarterly monitoring report indicated that groundwater quality had improved, but elevated VOC and SVOC levels persisted at the site.

Limited Phase II Environmental Site Investigation for Police Impoundment Area (March 12, 2007)
LiRo completed a Limited Phase II Investigation for the NYPD Impound Lot in March 2007. For the investigation, forty-five (45) Geoprobe borings were advanced throughout the site (see Figure 7-2, "Boring Location Plan"). Environmental soil samples were collected at each boring location. Eight (8) of the boring locations were completed with temporary well points for collecting groundwater samples. LiRo also conducted organic vapor screening using a PID, testing for lower explosive limit (LEL), and methane gas monitoring.

Based upon the Phase II investigation results, the soil and groundwater contamination present at the NYPD Impound Lot site appears to have resulted primarily from historic filling activities. This conclusion was supported by the type of contaminants detected (i.e. primarily SVOCs and metals), the widespread distribution of contamination, and the absence of on-site reported spills or indicators of on-Site sources. Petroleum groundwater contamination at the NYPD Impound Lot was attributed to impact from the Corona Auto and Truck site. One soil sample showed a lead concentration, which exceeded the hazardous waste limit.

LiRo recommended that, to comply with NYCDEP remedial requirements, the site would likely require a secure barrier or cap preventing direct exposure to site contaminants for future site users. Future site construction workers would be potentially exposed to soil contaminants during construction of the new building and during future construction activities requiring excavation. In order to protect site construction workers, the surrounding community, and the environment during the site construction phase, measures should be taken to ensure that any soil excavated for utilities or foundations are managed in accordance with applicable regulations. Based on the findings of the investigation, LiRo recommended that detailed site construction plans should be developed with provisions to address known site contaminants.

Soil Quality Investigation

Soil Description
Soil samples were screened and described in the field by a LiRo geologist. The soils encountered were described at all locations as re-graded or fill consisting of multi-colored sand and gravel with some clay, brick, concrete, wood and asphalt fragments, plastic and glass. The depth of fill ranged from 16 feet to 32 feet below grade (ftbg). Bedrock was not encountered. Native soil beneath the fill was described as gray/green/black silty clay at all locations across the site. These soils are consistent with the description of tidal marsh deposits. Based on historical documents, these deposits are a minimum of ninety (90) feet, thereby, occurring as natural barrier to downward contaminant migration.

Field screening for evidence of olfactory signs, staining and/or discoloration and PID readings, revealed suspect contamination at five locations in the subsurface fill material. Once the investigation had commenced, odors from decaying tidal marsh deposits and/or fill emanated from the boreholes. Subsequently, a methane-detecting meter was brought to the site for the balance of the investigation. Field screening revealed percent LEL of methane at various locations.

Laboratory Results for Soil and Groundwater Samples

Grab soil samples were collected form all boring locations for Target Compound List (TCL) VOC analysis by EPA Method 8260. Soils were also composited from the entire length of the soil column from most locations and analyzed for full list SVOCs by EPA Method 827OB, Target Analyte List (TAL) metal by EPA series 6000/7000, PCBs by EPA Method 8082 and Pesticides by EPA Method 8081.

The analytical results of the grab and column composite soil samples have been compared to the NYSDEC STARS Memo #1 and the Recommended Soil Cleanup Objectives (RSCO) included in the NYSDEC TAGM 4046 dated 1994. Additionally, the results were compared to the criteria under the UNSDEC 56 NYCRR Subpart 375-6 Soil Cleanup Objectives as follows: 1) Unrestricted Use, along with 2) Restricted Use Objectives: a) Residential, b) Restricted Residential c) Commercial and d) Protections of Groundwater. TAGM 4046 provided guidance for remedial actions, based on health-related concerns and available clean-up technologies. The Subpart 375-6 Soil Cleanup Objectives are based on the New York State "Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document" dated September 2006.

As mentioned above, the grab and column composite soil analytical results have been compared to several criteria. However, for discussion, the results are only compared to NYSDEC TAGM 4046 RSCO guidance values. Comparison to NYSDEC 6 NYCRR Subpart 375-6 Soil Cleanup Objectives and NYSDEC STAS Memo #1 are not discussed because the site does not appear to fall into any of NYSDEC's defined spill or environmental restoration program categories. Criteria under NYSDEC TAGM 4946 RSCO are most applicable to site conditions and therefore will be discussed in the following sections.

Because of early analytical results being available, soil composite samples from SB-8, SB-12, SB-27, SB-36, SB-38 and SB-39 were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metal analysis and compared to NYSDEC 6 NYCRR Part 371 for toxicity characteristic.

Groundwater samples were collected from temporary well locations at borings SB-2A, SB-8, SB-12, SB-15, SB-26, SB-31, SB-33 and SB-42 and analyzed for full list VOC analysis by EPA Method 8260, for full list SVOCs by EPA Method 8270B and Target Analyte List (TAL) Metals by EPA series 6000/7000. Groundwater analysis results were compared to the New York State Department of Environmental Conservation (NYSDEC) Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Guidance Values.

Groundwater samples collected from borings SB-12, SB-26 and SB-42 were analyzed for Non-polar material, pH, Temperature, Flash Point, Cadmium, Chromium (VI), Copper, Lead, Mercury, Nickel, Zinc, VOCs including [Benzene, Carbontetrachloride, Chloroform, 1,4 Dichlorobenzene, Ethylbenzene, MTBE (Methyl – Tert – Butyl- Ether), Naphthalene, Phenol, Tetrachloroethylene (Perc), Toluene, 1,2,4 Trichlorobenzene, 1,1,1 Trichloroethane, Xylenes (Total)] PCB's (Total), Total Suspended Solids (TSS), CBOD, Chloride, Total Nitrogen, and Total Solids. Groundwater analysis results were compared to the NYCDEP Limitations for Effluent to Sanitary or Combined Sewers. The purpose of the NYCDEP effluent parameter analysis is to evaluate the need for groundwater treatment during any future construction dewatering that may be necessary to support redevelopment.

Volatile Organic Compounds (VOCs) in Soil
VOCs were detected above TAGM RSCO in eight of the 45 soil samples collected. The specific compounds detected above TAGM RSCO include acetone, isopropylbenzene, m+p xylene, n-propylbenzene and o xylene.

With the exception of acetone, the detection of the above mentioned compounds above TAGM RSCO were isolated to one soil sample (SB31). Numerous acetone results were flagged with a B, which indicates that the compound was detected. Acetone is a common laboratory contaminant used to clean glassware.

Total VOCs were detected above total TAGM RSCO in one of the 45 soil samples collected (SB31). The specific compounds contributing to the high total VOCs in SB31 are listed above.

Semi-volatile Organic Compounds (SVOCs) in Soil
SVOCs were detected above TAGM RSCO in 46 of the 49 soil samples collected. The specific compounds detected above TAGM RSCO include benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno (1,2,3-cd)pyrene, bis)2-ethylhexyl)phthalate, di-n-octyl phthalate and phenol.

With the exception of phenol and bis(2-ethylhexyl)phthalate, all of the SVOCs detected are classified as polynuclear aromatic hydrocarbons (PAHs), which are a class of chemicals commonly found in tar, asphalt and combustion residues that are characteristic of typical New York City fill material. Phenol is also a compound typically found in New York City fill material. Bis(2ethylhexyl)phthalate is a common component of plastic and may be attributable to plastic fragments found in the fill.

Total SVOCs were detected above total TAGM RSCO in one (SB9) of the 49 soil samples collected. The compound contributing to the high total VOCs in SB9 is bis9(2ethlyhexyl)phthalate, which is a common component of plastic and may be attributable to plastic fragments found in the fill.

PCBs in Soil
PCBs were detected above TAGM RSCO in two (2) of the 49 soil samples collected. The specific compounds detected above TAGM RSCO include aroclor 1016, aroclor 1254 and aroclor 1260.

Analytical sampling of the soil showed that residual PCBs were present at numerous locations across the site. Based on the widespread distribution of PCBs at the site, observations of the physical characteristics of the fill that is present, and the absence in the site historical records of any features that might be associated PCB-bearing equipment use, storage or disposal, LiRo believes that the PCB residuals are a component of the existing fill. There is no evidence of any point source or “PCB spill” at the site.

Total PCBs were detected above total surface TAGM RSCO in seven (7) of the 49 soil samples collected. Total PCBs were detected above total subsurface and total surface TAGM RSCO in two (2) of the 49 soil samples collected. The specific compounds contributing to the high total PCBs are listed above.

Pesticides/PCBs in Soil
Only dieldrin was detected above TAGM RSCO in one (1) of the 49 soil samples collected.

Metals in Soil
Metals were detected above TAGM RSCO in all of the 45 soil samples collected. The specific metals detected above TAGM RSCO include arsenic, cadmium, chromium, copper, iron, lead, nickel, zinc,

magnesium, mercury, barium, vanadium, beryllium, calcium, selenium and cobalt. The metals detected are commonly found in New York City fill material.

Toxicity Characteristic Leaching Procedure (TCLP)
To determine if the metals present in the samples mentioned above are at hazardous levels, TLP analysis for Metals was performed on samples from SB-8, SB-12, SB-27 SB-36, SB-38 and SB-39. The results revealed that the leachable lead concentration in sample SB-12 exceeds the NYSDEC hazardous waste limit. There were no exceedances for the other metals in the TCLP results. In reviewing the results, LiRo observed that there is a very poor correlation between the lead total results and the TCLP results. This data suggests that the fill composition is highly variable at the site and, therefore, soil contaminant limits cannot be "delineated" with any degree of confidence. The conclusion of highly variable fill composition is also supported by the wide variation in results for organic compounds at the site and by the Phase I conclusion that the site fill was placed episodically over a number of years.

Groundwater Quality Investigation

Groundwater Description
Groundwater occurred in the Geoprobe boreholes at depths ranging from approximately 9 to 15 feet bgs at the site. Based on this information, the borings with lowest relative elevations are in the southern portion of the site. The groundwater flow direction is, therefore, estimated to be south.

NYCDEP Limitations for Effluent to Sanitary or Combined Sewers
Groundwater was collected for analysis of NYCDEP Limitations for Effluent to Sanitary or Combined Sewers from temporary wells installed at SB-12, SB-26 and SB-42. The laboratory analysis revealed that groundwater from SB-26 and SB-42 is suitable for discharge to sanitary or combined sewers without treatment from contaminant removal. However, any project requiring dewatering plans should include provisions for sediment removal (i.e. filtration or settling tanks). The sample from SB-12 revealed an exceedance of Methyl tert-butly ether (MTBE). Total Suspended Solids (TSS) were present at exceedance levels in the samples at SB-12 and SB-26, however, excess suspended sediment is inherently present in temporary wells, which results in artificially high TSS.

NYCDEP no longer regulates storm sewer discharge throughout NYC. Therefore, if discharge into storm sewers is required during dewatering, it must be done under the appropriate NYSDEC Industrial State Pollutant Discharge Elimination System (SPDES) permit. Additional sampling and laboratory analysis will be required to satisfy NYSDEC requirements prior to discharge into storm sewers.

VOCS in Groundwater
VOCs were detected above NYSDEC TOGS in five (5) of the eight (8) groundwater samples collected. The specific compounds detected above NYSDEC TOGS include methyl tert-butyl ether, benzene, 1,4 dichlorobenzene, naphthalene, ethyl benzene, m+p xylene, o xylene, isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene and 1,2,4 trimethylbenzene.

The previous investigation from the adjacent Corona Auto Repair site showed similar total VOC levels. In November 2005, the downgradient monitoring well at the Corona Auto and Truck site showed similar total VOC levels (30 ppb) to the nearby temporary monitoring well point at the Police Impoundment site (127.4 ppb). Comparing these results suggest that groundwater contamination at the site is a result of the petroleum contamination at the Corona Auto site.

SVOCs in Groundwater
SVOCs were detected above NYSDEC TOGS in seven (7) of the eight (8) groundwater samples collected. The specific compounds detected above NYSDEC TOGS include pentachlorophenol, benzo(a)anthracene, chrysene, benzo(b)fluoroanthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, bis(2-ethylhexyl)phthalate, 1,4 dichlorobenzene, 2,4 dimethylphenol, naphthalene and phenol. The contaminants are likely attributable to a combination of suspended sediment, historic fill material used at the site and nearby historic fuel spills.

Metals in Groundwater
Metals were detected above NYSDEC TOGS in each of the two groundwater samples collected. The specific metals detected above NYSDEC TOGS include arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, sodium, and zinc. The contaminants are likely attributable to suspended sediment and historic fill material used at the site. Iron was detected above NYSDEC TOGS in three (3) of the eight (8) groundwater samples collected.

PCBs in Groundwater
PCBs were detected above NYSDEC TOGS for total PCBs in three (3) of the eight (8) groundwater samples collected. The specific compounds contributing to the total PCBs include aroclor 1254, aroclor 1260 and aroclor 1016.

Pesticides in Groundwater
Pesticides were detected above NYSDEC TOGS in four (4) of the eight (8) groundwater samples collected. The specific compounds detected above NYSDEC TOGS include delta-BHC, heptachlor epoxide, dieldrin, 4,4'DDT, alpha-BHC and heptachlor.

Soil Vapor Investigation

Based on the results of the field investigation and comparison of the analytical results to the following regulatory guidance values –1) NYSDEC TAGM 4046, 2) NYSDEC TOGS, and 3) NYSDEC 6 DYCRR Part 371 for toxicity characteristic, the following conclusions are presented:

- Field screenings of the borings revealed percent lower explosive limit (LEL) readings ranging from 1.3 percent to 594 percent. A reading of 100 percent LEL corresponds to a methane level of 5 percent methane per volume of air, which is the concentration at which methane is explosive. LEL readings greater than 100 percent indicate that methane concentrations are greater than 5 percent.
- The borings were also screened using a direct read gas analyzer for methane. This screening revealed downhole methane readings ranging from 2.5 percent to 59.4 percent.

All 20 temporary soil gas probes performed resulted in non-detectable (ND) levels of methane.

Phase II Environmental Site Investigation for Crystal Windows[3] and Corona Auto and Truck Site (May 20, 2008)
In May 2008 LiRo completed a Phase II Environmental Site Investigation for the area bounded by 28th Avenue to the north, 31st Avenue to the south, College Point Boulevard to the west and the NYPD vehicle impound facility to the east. The total land area was approximately 3 acres. Corona Auto and

[3] The vacant portion of land immediately to the south of the Corona Auto and Truck site became known as the Crystal Windows site because this local manufacturer had been in talks with the City to acquire this property. While that deal was never finalized, the Crystal Windows name remained associated with this parcel of land.

Truck occupies the northern portion of this site and the remaining portion of the site was vacant (formerly used by the NYPD as part of the impound operations).

LiRo completed the Phase II field investigation on April 12, 2008. The Phase II was performed to evaluate soil and groundwater concerns identified during the Phase I ESA completed January 31, 2008 by LiRo. The Phase I ESA determined that an active petroleum spill (#9907006) remediation project was ongoing at the Corona Auto and Truck portion of the site and that more than 30 historical spills were recorded within an eighth of a mile of the site. A previous Limited Phase II Investigation at the "Crystal Windows" portion of the site was completed by Aneptek Corporation (Aneptek) in November 2003. The Aneptek investigation showed that soil and groundwater contained petroleum contaminants, PCBs and metals. Aneptek concluded that two plumes of fuel-related groundwater contamination were present – a northern plume near the corner of 28th Avenue and College Point Boulevard attributed to the Corona Auto and Truck spill and a southern plume near 31st Avenue and College Point Boulevard attributed to undocumented historical petroleum releases. Following the recommendations of LiRo's Phase I ESA, the Phase II ESI included the advancement of seven soil borings for the collection of soil samples and the installation of two temporary well points for the collection of groundwater samples. Seven soil borings (SB-1 through SB-7) were installed within the site boundaries (see Figure 7-3, "Boring Location Plan for the Corona and Crystal Portions of the Site"). Temporary monitoring wells TWP-1 and TWP-2 were installed in borings SB-1 and SB-7, respectively.

The analytical results of soil samples have been compared to the Recommended Soil Cleanup Objectives (RCSOs) included in the NYS DEC Technical and Administrative Guidance Memorandum (TAGM) #4046, dated 1994. Toxicity characteristic leaching procedure (TCLP) and hazardous waste characteristic test results were compared to Characteristics of Hazardous Waste published in the Resource Conservation and Recovery Act (RCRA) and NYS DEC Part 371. Groundwater sample results were compared to NYS DEC Technical and Operational Guidance Series (TOGS) 1.1.1.- Ambient Water Quality Standards and Guidance Values and to the NYCDEP Bureau of Wastewater Treatment (BWT) Limitations for Effluent to Sanitary or Combined Sewers.

Based on the results of the field investigation and a review of the analytical results compared to the aforementioned regulatory criteria, the following conclusions are presented:

- Field screening for evidence of olfactory signs, staining and/or discoloration and Photo-Ionization Detector (PID) readings showed historic fill to the bottom depth of all borings. Elevated PID readings were observed at borings SB-1, SB-2, and SB-4.
- Volatile organic compounds (VOCs) were not detected above TAGM #4046 RSCOs in any of the seven soil samples collected.
- Polycyclicaromatic hydrocarbons (PAHs) were detected in all seven soil samples collected. PAHs are a type of SVOC present in oil, coal, and tar. Exceedences of TAGM RSCOs for SVOCs were detected for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenzo(a,h)anthracene. The contaminants may be a result of nearby historic fuel spills and historic fill material used at the site.
- Metals were detected above TAGM RSCOs in all of the soil samples and above their respective Eastern USA Background concentrations in six of the seven soil samples (all except SB-6) collected during this ESI. The specific metals detected above TAGM RSCOs include arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, nickel, zinc, and mercury. The metals detected are commonly found in New York City fill material.
- Pesticides were detected in six of the seven soil samples (all except SB-6) collected during this ESI. No pesticides were detected above TAGM RSCOs in any of the samples collected. The pesticides detected are attributable to historic fill material.

- PCBs were detected in six of the seven soil samples (all except SB-6) collected during this ESI. No PCBs were detected above TAGM RSCOs in any of the samples collected. The PCBs detected are attributable to historic fill material.
- TCLP and Waste Characterization results determined that the composite soil sample collected from borings SB-1 through SB-7 was non-hazardous.
- The concentrations detected for Total PCBs (0.0016 mg/L) and total Suspended Solids (860 mg/L) in a groundwater sample collected from SB-1/TWP-1 exceeded NYCDEP Limitations for Effluent to Sanitary or Combined Sewers. The PCB and TSS exceedances are likely a result of high levels of suspended sediment (typical of groundwater samples from undeveloped wells) in the samples.
- VOCs were detected above NYSDEC TOGS in each of the two groundwater samples collected.

The specific compounds detected above NYSDEC TOGS include methyl-tert butyl ether (MTBE) and benzene. The contaminants are likely attributable to the Corona Auto and Truck site spill, however, the Phase I report documented more than 30 historic spills within an eighth of a mile of the site so it is possible that the Corona contamination is co-mingled with these other potential sources:

- SVOCs were detected above NYSDEC TOGS in the groundwater sample collected from SB-7/TWP-2. 3+4-methylpenols were detected above NYSDEC TOGS as well as several PAHs including phenanthrene, benzo(a)anthracene, benzo(b)fluoroanthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, fluoranthene and pyrene. The contaminants are likely attributable to a combination of suspended sediment, historic fill material used at the site and nearby historic fuel spills. As noted above, the Corona Auto and Truck site spill contamination may be co-mingled with contamination related to other historic spills.
- Metals were detected above NYSDEC TOGS in each of the two groundwater samples collected. The specific metals detected above NYSDEC TOGS include arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, sodium, and zinc. The contaminants are likely attributable to suspended sediment and historic fill material used at the site.

Based on the results of this field investigation and the analytical testing, LiRo has made the following conclusions:

- VOCs, pesticides and PCBs were not detected above applicable RSCOs in any of the soil samples collected. SVOCs and metals were detected in all samples at levels exceeding RSCOs. Historic fill was observed at all boring locations completed during this ESI.
- Groundwater analytical results indicate relatively low levels of dissolved phase contamination across the site. Exceedances of NYSDEC Groundwater Quality Standards were detected for VOCs (both wells), SVOCs (SB-7/TWP-2) and metals (both wells). Based on LiRo's Phase II results, it appears that VOC/SVOC groundwater contamination is relative wide-spread throughout the site at relatively low levels.
- Groundwater analytical results showed exceedances of NYCDEP Limitations for Effluent to Sanitary or Combined Sewers for Total PCBs and Total Suspended Solids in the sample collected from SB-1/TWP-1.

The soil contamination present in the Phase II ESI borings appears to have resulted primarily from the historic fill material used at the site. This conclusion is supported by the type of contaminants detected (i.e. primarily SVOCs and metals) and the widespread distribution of contamination. LiRo's Phase II results were generally consistent with the previous (Aneptek) Limited Phase II Investigation that was completed in 2003. The Aneptek report showed widespread low-level soil impacts with petroleum-related VOCs and SVOCs as well as low-level (relative to TAGM RSCOs) PCBs in soil.

The Corona Auto and Truck portion of the site is impaired with petroleum contaminants resulting from active spill #9907006. As of the date of publication for this LiRo document, the City of New York was remediating the spill under Consent Order with NYSDEC and soil and groundwater contamination persists. LiRo recommended that the status of and future responsibility for the site should be determined.

Due to the historic fill source and level of contamination in the portion of the site that is currently being used for the NYPD vehicle impoundment, this area does not appear to fall into any of NYSDEC's defined spill or environmental restoration program categories. As such, there is no requirement to remove contaminated soil from the impoundment area or to treat soil to any cleanup standard. Any contaminated soil which is being excavated during the course of building construction is defined by NYSDEC as a solid waste and that material will be subject to applicable regulations for transport and disposal.

NYCDEP is typically responsible for overseeing construction at contaminated properties in New York City. To comply with NYCDEP remedial requirements, the site will likely require a secure barrier or cap preventing direct exposure to site soil contaminants for future site users. Future site construction workers will be potentially exposed to soil and groundwater contaminants during construction of the proposed Academy and during future construction activities requiring excavation. In order to protect the site construction workers, the surrounding community, and the environment during the site construction phase, measures should be taken to ensure that any soils excavated for utilities or foundations are managed in accordance with the applicable regulations. Based on the findings in the Phase II investigation, site construction plans will likely require the following provisions to address known site contaminants.

- A Construction Health and Safety Plan (CHASP) will be required to ensure that on-site construction workers and the surrounding community are not exposed to site contaminants. The CHASP should include a Community Air Monitoring Plan to mitigate potential exposure via fugitive dust.
- A Remedial Action Plan (RAP) will be required to ensure that any contaminated soil excavated for building foundation structures or subsurface utilities is properly characterized, transported, and disposed of at an off-site facility permitted to accept contaminated soil. The components of the RAP would include proper management (excavation, handling, and disposal) of excavated material, including soil, to allow for the installation of utilities and the foundation components (pile caps, slab, etc.).
- Based upon the detection of VOCs and SVOCs in soil and groundwater, any site redevelopment should include engineering controls to mitigate vapor intrusion. Future site building designs should include vapor barriers and sub-slab ventilation systems.
- If dewatering activities will be required for site redevelopment, groundwater should be characterized for compliance with NYCDEP discharge parameters. Based on the Phase II NYCDEP discharge analysis, a treatment approach may be required for PCBs and suspended solids. Groundwater treatment requirements for dewatering should also include provision for the disposal of contaminated sediment.
- The NYCDEP will likely require that a minimum of 2 feet of "TAGM certified clean" fill cap (i.e. composition of fill below TAGM 4046 guidance values) be placed over landscaped, non-paved areas for the entire site.
- NYCDEP typically requires that clean fill must be certified by laboratory analysis for VOCs, SVOCs, Metals, PCBs and Pesticides at a sample frequency of 1 sample per 250 cubic yards of material. Results are submitted to NYCDEP for approval prior to import to the site.

- A memorandum of understanding should be prepared for the property to ensure that future site intrusive construction or maintenance work will include the practices described above to prevent accidental exposure to contaminants.
- A Closure Report certified by a Professional Engineer or Registered Architect, documenting that the activities identified in the RAP have been completed is also required by NYCDEP.

NYCDEP Response to the Submitted Phase I and Phase II ESA Material (November 13, 2008)
All Phase I and Phase II reports were submitted to NYCDEP for review and comment. NYCDEP issued a comment letter dated November 13, 2008 responding to the submitted documents. The NYCDEP comments were consistent with LiRo's list of anticipated NYCDEP requirements for the proposed development site. NYCDEP made the following comments:

- As a result of on-site/off-site soil and groundwater impacts, presence of urban fill material, methane gas, etc. that would negatively impact the proposed project, a RAP is required for the site.
- The RAP must include adequate mitigation measures to address off-site soil disposal in accordance with all federal, state, and local regulation; vapor barrier requirements (min. 20-mil thickness) and passive sub-slab depressurization system (SSDS) with the ability to be retrofitted to an active system in the future (if warranted), beneath all on-site structures; dewatering operation/applicable permits during construction; demolition requirements in accordance with al applicable federal, state, and local regulations for existing buildings that may include the presence of asbestos containing material, lead-base paint, mercury/PCB containing electrical components, etc.; two feet of certified clean fill/top soil capping in any proposed landscaped areas not capped with concrete or asphalt; submission of P.E certified Remedial Closure Report upon completion of all DEP remedial requirements; and a site-specific CHASP for the on-site workers during soil disturbance/initial construction while excavated soils are exposed.
- The RAP and CHASP must be submitted to DEP for review/approval prior to soil disturbance/construction.

As described below under conditions in the Future With the Proposed Action (Build Conditions), a CHASP and RAP were submitted to NYCDEP on December 1, 2008 for comment and review. Details of the NYCDEP-approved, site-specific CHASP and RAP are included below.

C. FUTURE WITHOUT THE PROPOSED ACTION (NO-BUILD CONDITION)

In the future without the Proposed Action, it is assumed that there would be minimal changes in the use of the Project Site. As described in Chapter 2, "Land Use, Zoning, and Public Policy," in absence of the Proposed Action, it is expected that the northwestern portion of the proposed development site (the Corona Auto and Truck Site) would continue to be used as an automotive service facility. It is expected that the remainder of the site, most of which is currently used as the College Point Tow Pound, would be vacant. Tow pound operations will be relocated to a new location by 2014 as the NYPD consolidates and reorganizes its citywide operations.

As discussed in detail in Chapter 2, the southern 5-acres of the College Point Tow Pound site would not be included in the proposed Academy's site boundaries. It is expected that these five acres would be developed by 2014. This development is expected to occur regardless of the Proposed Action.

The exposed on-site drainage ditch that bisects the property is expected to remain unchanged in the future without the Proposed Action.

In the 2014 future without the Proposed Action, no in-ground disturbance or excavation is anticipated within the boundaries of the proposed Academy site. Historic fill material is not likely to be exposed, and therefore, no remedial activities would be required at the site. Because the site will generally continue in its current condition, there will be no exposure pathways for hazardous materials.

D. FUTURE WITH THE PROPOSED ACTION (BUILD CONDITION)

The potential for significant adverse impacts in the future with the Proposed Action is determined by a number of factors including the types and locations of hazardous materials and wastes, the proposed uses of the Project Site, and the potential for human and environmental exposure to site contaminants at each location where present. To determine if a significant adverse impact would result relative to human exposure, exposure pathways must be evaluated. According to NYSDEC guidance, "An exposure pathway has five elements: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) route of exposure; and (5) a receptor population. An exposure pathway is complete when all five elements are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future."[4]

Human exposure considers construction workers, those persons on-site at present and future times (occupants and visitors), as well as persons off-site (neighborhood population). Potential and complete human exposure pathways must be evaluated for the construction phase, and after redevelopment is complete for all persons that may be exposed to site contaminants.

The Proposed Action would facilitate the construction of a new Police Academy for the city of New York. The proposed facility would consist of an approximately 2.4 million gsf and would include indoor training facilities, classrooms, and related support space, an indoor pistol training facility, a tactical village, an indoor track, a police museum, a visiting police/lecturer housing facility and 2,000 accessory parking spaces, including an above-grade 1,800-space parking garage and 200 additional at-grade parking spaces that would be located throughout the site.

The Proposed Action would represent a change in land use and an increase in density on the proposed development site, replacing the northern portion of the NYPD's College Point Tow Pound, an auto service facility, and a City-owned vacant parcel along College Point Boulevard with a new NYPD Academy and training facilities. The proposed development would consolidate and replace many of the NYPD's disbursed training facilities into one centralized location. The proposed Academy is expected to become a world-class police training facility, which would accommodate both recruit and in-service training.

The Proposed Action would involve below-grade disturbance with soil excavation, as necessary, to drive piles, to construct building foundations, and install subsurface utilities on the proposed development site and within the public street. However, below-grade disturbance is expected to be limited. Due to the high water table in the area and the propensity of the area to retain water, the proposed development would employ an extensive pile system to support the proposed buildings on the Police Academy site. Additionally, the proposed Academy would incorporate a design that is mindful of the area's propensity to flood, resulting in the ground level to be raised above the flood zone with certified clean fill that would be imported for site grading and landscaping.

[4] DEC-10 Technical Guidance for Site Investigation and Remediation, Appendix 3B, (December 2002).

There is a potential for adverse impacts during construction activities resulting from the presence of possible subsurface contamination due to historic and existing uses at the Project Site. The ESA reports prepared for the Project Site, referenced above under existing conditions, have identified *recognized environmental conditions* (e.g., hazardous materials and/or petroleum product contamination) that could have the potential to impact the proposed development. Excavation and construction activities on the Project Site could disturb potential hazardous materials and increase pathways for human exposure. However, it is anticipated that impacts would be avoided by performing construction activities in accordance with all applicable regulations related to the removal and/or containment of contaminated soil.

As discussed in Chapter 17, "Mitigation," a Construction Health and Safety Plan (CHASP) and Remedial Action Plan (RAP) have been prepared in accordance with the applicable requirements set forth by the Occupational, Safety and Health Administration (OSHA), NYSDOH, NYCDEP, and any other applicable regulations to address the recognized environmental concerns on-site. The CHASP identifies the possible locations and risks associated with the potential contaminants that may be encountered, and the administrative and engineering controls that would be utilized to mitigate concerns. The RAP addresses the implementation of remedial measures that would be required to safely construct the proposed project on-site. NYCDEP has reviewed and approved the CHASP and RAP for the proposed project.

Recognized Environmental Conditions

Soil Contamination

The development of the proposed Police Academy would include the construction of a new campus, the related infrastructure, and utilities – all of which would involve intrusive activities such as excavation. It is likely that contaminated soil would be encountered during construction exposing workers and potentially occupants and neighboring population to contaminants. The complete human exposure pathway resulting from intrusive activities would be considered a significant adverse impact, but can readily be mitigated.

In order to evaluate the subsurface soil and soil from debris piles, laboratory analytical results and field measurements were compared with the United States Environmental Protection Agency (EPA) and NYSDEC regulatory standards identified in:

- NYSDEC: Spill Technology and Remediation Series (STARS) Memo #1 establishes statewide criteria for re-use of petroleum-contaminated soil, provides guidance for specific petroleum-related VOCs and SVOCs, odors, and other nuisance factors, and provides Toxicity Characteristic leaching Procedure (TCLP) Alterative Guidance Values (AGVs) for waste characterization purposes;
- USEPA: Maximum Concentration of Contaminants for the Toxicity Characteristic (Resource Conservation and Recovery Act [RCRA] Regulatory Limits for TCLP), published in 40 Code of Federal Regulations (CFR) 261.24, provides solid waste toxicity standards for compounds using the TCLP procedure, Test Method 1311, to determine if the material tested can be considered hazardous (1993);
- NYSDEC: Identification and Listing of Hazardous Wastes regulation, Toxicity Characteristic section as per 6 New York Codes, Rules and Regulations (NYCRR) Subpart 371 (3)(e), stipulates the same requirements as dictated in the federal standard 40 CFR 261.24 listed above (2006);
- NYSDEC: Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs), as per 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives, represent the concentration of a

contaminant in soil which, when achieved at a site will require no use restrictions on the site for the protection of public health, groundwater and ecological resources due to the presence of contaminants in soil (2006);

- NYCDEC: Technical and Administrative Guidance Memorandum #4046 (TAGM) Recommended Soil Cleanup Objectives (RSCOs) provide guidance for remedial actions at NYSDEC Inactive Hazardous Waste and Spill sites, based on health-related concerns and available clean-up technologies (1994).

The Phase II ESI results indicated fill soil throughout the Project Site has elevated levels of various VOCs and SVOCs, which are characteristic of urban fill. The elevated concentrations of SVOCs are common constituents of urban fill material. Metals were detected above TAGM RSCO in most of the soil samples collected. The specific metals detected above TAGM RSCO are described above under the description of Existing Conditions. The metals detected are commonly found in New York City fill material. Elevated metal levels are mainly attributed to contaminants historic filling activities on-site and may be partially attributed to spills in the local area.

As described above, PCBs were detected above TAGM RSCO in two (2) of the 49 soil samples collected. The specific compounds detected above TAGM RSCO include aroclor 1016, aroclor 1254 and aroclor 1260. Analytical sampling of the soil showed that residual PCBs were present at numerous locations across the site. Based on the widespread distribution of PCBs at the site, observations of the physical characteristics of the fill that is present, and the absence in the site historical records of any features that might be associated PCB-bearing equipment use, storage or disposal, LiRo believes that the PCB residuals are a component of the existing fill. There is no evidence of any point source or "PCB spill" at the site. Total PCBs were detected above total surface TAGM RSCO in seven (7) of the 49 soil samples collected. Total PCBs were detected above total subsurface and total surface TAGM RSCO in two (2) of the 49 soil samples collected. The specific compounds contributing to the high total PCBs are listed above.

Human exposure can be reduced or eliminated using proven remedial technologies and/or institutional and engineering controls discussed in Chapter 17, "Mitigation." Impacted soils in the area of proposed excavation should be removed and disposed of in accordance with all applicable local, state and federal laws. Unpaved or landscaped surfaces should be covered with at least two feet of certified, clean fill and vegetative topsoil. Due to the presence of VOC, SVOC and metal concentrations above applicable standards at several sampling locations, dust control procedures are recommended during excavation activities to minimize the creation and dispersion of fugitive airborne dust. A Community Air Monitoring Plan (CAMP) should be developed in accordance with NYSDEC DER-10 Regulations. The CAMP requires real-time monitoring for VOCs and particulates (i.e., dust).

Groundwater Contamination

The applicable groundwater standards in New York are the Ambient Water Quality Standards and Guidance Values in 6 NYCRR Part 703. The groundwater standards are not based on land use categories, as are soil cleanup objectives, but rather pertain to specific classes of fresh and saline waters for the protection of "best uses" assigned to each class. The groundwater is classified as GA- a source of drinking water even though groundwater is not currently used as a potable water supply.

The Phase II ESI results also indicated VOCs were detected above NYSDEC TOGS in five (5) of the eight (8) groundwater samples collected. The specific compounds detected above NYSDEC TOGS are described above under the discussion of Existing Conditions. Additionally, SVOCs were detected above NYSDEC TOGS in seven (7) of the eight (8) groundwater samples collected. The specific compounds detected above NYSDEC TOGS are also described above under the discussion of Existing

Conditions. The contaminants are likely attributable to a combination of suspended sediment, historic fill material used at the site and nearby historic fuel spills.

Metals were detected above NYSDEC TOGS in each of the two groundwater samples collected. The specific metals detected above NYSDEC TOGS are described above under the discussion of Existing Conditions. The contaminants are likely attributable to suspended sediment and historic fill material used at the site. Iron was detected above NYSDEC TOGS in three (3) of the eight (8) groundwater samples collected.

PCBs were detected above NYSDEC TOGS for total PCBs in three (3) of the eight (8) groundwater samples collected. The specific compounds contributing to the total PCBs include aroclor 1254, aroclor 1260 and aroclor 1016.

Pesticides were detected above NYSDEC TOGS in four (4) of the eight (8) groundwater samples collected. The specific compounds detected above NYSDEC TOGS include delta-BHC, heptachlor epoxide, dieldrin, 4,4'DDT, alpha-BHC and heptachlor.

At areas of the Project Site where contaminants are found in excess of groundwater quality standards, the groundwater must be addressed prior to or during redevelopment. Human exposure pathways can be reduced or eliminated during construction and for the future with the Proposed Action by the use of engineering controls and by prohibiting groundwater use for potable purposes in the future; however, at areas with significant concentrations of contaminants in groundwater, remediation may be required prior to construction. The time required to effectively remediate groundwater could impact development plans. Groundwater contaminated with volatile organic compounds is also a source of contaminated soil vapor.

If water would be discharged to a NYCDEP combined sanitary and storm sewer, the water must be sampled for NYCDEP sewer discharge parameters. Based on the above findings, a NYCDEP sewer discharge permit may be required, and prior to discharge into sanitary and combined sewers, sampling, laboratory analysis, and pretreatment of water from this location would be required. A NYSDEC SPDES permit may also be required to discharge into a storm sewer.

Soil Vapor Contamination

To evaluate methane levels generated by an organic layer beneath the urban fill, a soil gas survey was conducted on the project site. Contaminated soil vapor entering the proposed buildings would result in complete human exposure pathway to these contaminants – a significant adverse impact if the concentrations are high enough. As described above, soil gas sample points were performed for the Phase II ESI within the boundaries of the project site. All 20 temporary soil gas probes performed resulted in non-detectable (ND) levels of methane. Therefore, methane does not appear to pose an issue to the proposed construction site and therefore, no human exposure would result.

Introduction of Hazardous Materials from Proposed Police Academy

The proposed Police Academy development may introduce hazardous materials to the site; specifically, storage of petroleum products for on-site generators that could result in future spills that could impact soil and groundwater. Preventative measures required by various environmental regulations include, but are not limited to, secondary containment for storage tanks; preparation of spill and emergency response plans; proper labeling, storage and manifesting of hazardous wastes, and proper training of personnel that handle hazardous materials and wastes. Each of these preventative measures help to reduce the likelihood of future hazardous materials incidents on the proposed

Academy site. However, the proposed Police Academy is not expected to introduce new hazardous materials such that significant adverse impacts would result.

E. CONCLUSION

The subsurface investigations involved extensive testing throughout the project site. The Phase II ESI results indicated fill soil throughout the project site has elevated levels of various VOCs and SVOCs, which are characteristic of urban fill. The results also indicated elevated levels of a variety of contaminants in the groundwater, which can be attributed to the fill and the turbid nature of the groundwater samples that were collected.

Human exposure to existing on-site hazardous materials could be reduced or eliminated using proven remedial technologies and/or institutional and engineering controls discussed in Chapter 17, "Mitigation." Measures for addressing areas of identified contamination are outlined in the NYCDEP-approved CHASP and RAP, which are both summarized in Chapter 17. All remediation measures would be undertaken pursuant to the NYCDEP-approved RAP. The measures described in the CHASP and RAP would ensure that no significant adverse impact related to hazardous materials would occur.