3.13 SOIL, GROUNDWATER AND HAZARDOUS MATERIALS

A Phase I Environmental Site Assessment (ESA) was completed by Tetra Tech EC, Inc. (TtEC) on behalf of the SCA in June 2008. The main objective of the Phase I ESA was to identify the presence or likely presence, use, or release of hazardous substances or petroleum products, which are defined in American Society of Testing and Materials (ASTM) Standard Practice E 1527-05 as recognized environmental conditions (RECs). In addition, other environmental issues or conditions such as radon, asbestos-containing materials (ACM), lead-based paint (LBP), and polychlorinated biphenyl (PCB) containing equipment and caulking materials were evaluated. The Phase I ESA included a site inspection, a review of the existing data on geology and hydrology of the area, and a review of historical maps, local agency records, and other documents to assess past and current uses of the Site and adjacent areas.

The Phase I ESA identified RECs associated with historic uses of the site property as a window shade factory; a textile factory; a furniture factory; and a cigarette factory. The historical site structures were demolished prior to 1985. The demolition of these structures presents an additional on-site REC, as there is a potential that fill material was used to re-grade the site. In addition to the RECs listed above, several environmental concerns were identified at the site, including one corroded 4,000-gallon steel walled aboveground storage tank (AST) without current registration located in the basement of PS 133; suspect interior and exterior LBP; suspect ACM; and suspect PCB-containing light ballasts and caulking.

The Phase I ESA also identified several RECs on surrounding properties, including an auto repair shop located on the adjacent property to the north; a historic undertaker located on the adjacent property to the east; the historic presence of an auto top manufacturer, cabinet maker, and funeral home located on adjacent properties to the south; a historic metal goods manufacturing facility identified on the adjacent property to the south-southeast; and a historic gasoline filling station and several historic gasoline storage tanks located on adjacent properties to the west. Three leaking underground storage tank (LTANK) facilities listed in the regulatory agency database search report are considered RECs due to their presumed upgradient locations and the spills have not been closed according to information provided in the database. In addition, the presence of six dry cleaning facilities located less than ¼ mile presumably upgradient from the site is considered a REC.

Based on the results of the review of the Phase I ESA, a Phase II Environmental Site Investigation (ESI) was completed in November and December 2008 to assess the RECs. The Phase II ESI consisted of a geophysical survey and the collection and analysis of subsurface soil, groundwater, soil gas, and ambient air samples.

3.13.1 Existing Conditions

The proposed project site is located in an area that is primarily characterized by multi-family residential structures with some limited commercial use. The site consists of a 46,000-square-foot lot with the PS 133 structure present on the southeastern portion of the property, the Baltic Street Community Garden on the northwest corner of the site, and playgrounds and parking on the remaining portions of the site. The PS 133 structure is a 3½-story building with a cellar. The building has an approximately 11,500-square-foot footprint, and a total of 46,100 square feet of interior space, constructed c. 1900. .Currently, PS 133 hosts grades Pre-K through Five.

Initial Phase II ESI field activities were performed in November 2008 and consisted of a geophysical survey; and collection of soil gas samples, soil samples, and groundwater samples for laboratory analysis. The soil gas samples were analyzed for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15. The soil samples were analyzed for Target Compound List (TCL)/Spill Technology and Remediation Series (STARS) VOCs, TCL/STARS semi-volatile organic compounds (SVOCs), PCBs, and Target Analyte List (TAL) metals. Three soil samples were also analyzed

for Toxicity Characteristic Leaching Procedure (TCLP) lead. Two soil samples were analyzed for TCL pesticides and two soil samples were analyzed for TCL/STARS VOCs, TCL/STARS SVOCs, TCL pesticides, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), Resource Conservation and Recovery Act (RCRA) metals, hexavalent chromium, and cyanide for pre-design waste characterization purposes. Ground water samples were analyzed for TCL/STARS VOCs, TCL/STARS SVOCs, PCBs, and TAL metals. One groundwater sample was also analyzed for New York City Department of Environmental Protection (NYCDEP) sewer discharge parameters.

A supplemental Phase II ESI was conducted in December 2008, to delineate lead contamination in the soil identified during the initial investigation, and consisted of a geophysical survey and collection of soil samples. Thirty soil samples were analyzed for total lead, of which 17 samples were also analyzed for TCLP lead. In order to better characterize the material disposal requirements, two additional samples were analyzed for TCL/STARS VOCs, TCL/STARS SVOCs, TCL pesticides, TPH-GRO, TPH-DRO, RCRA metals, hexavalent chromium, and cyanide.

Soil cores collected during the Phase II ESI indicated that the site is covered with up to one foot of asphalt and concrete (including the sub-base material), which is underlain by fill material consisting of silt, sand, gravel, ash, cinders, wood, and brick fragments ranging in thickness from 2 to 10 feet. The fill layer is underlain by up to 6 feet of fine sand with some silt and cobbles. A silt/clay layer and then a fine to coarse sand layer with trace silt are under the fine sand layer. The deepest interval of soil sampled from 20 to 30 feet below ground surface (bgs) was characterized as a clay layer with fine to medium sand. The maximum vertical depth of soil borings advanced during the Phase II ESI was 30 feet bgs.

Based on topography, groundwater is expected to flow west, towards the Gowanus Canal. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. Ground water was encountered during the Phase II ESI at depths ranging from 22.5 to 25 feet bgs.

Petroleum odors, a petroleum sheen, and elevated PID readings were identified in the field in select borings during the soil investigation along the western boundary of the site. Considering the location and depth of the identified impacts, it is likely that the gasoline filling station to the west of the site is the source of the contamination; however no free phase product was observed, and the analytical results did not show any exceedances.

Soil vapor samples revealed the presence of several petroleum- and chlorinated solvent-related VOCs at concentrations exceeding published indoor air VOC concentrations. Tetrachloroethene (PCE) and trichloroethene (TCE) were detected at concentrations exceeding their respective New York State Department of Health (NYSDOH) Air Guidance Values (AGVs) in one soil vapor sample. A comparison of the TCE and PCE concentrations in soil gas to Matrices 1 and 2 of the NYSDOH guidance document, respectively, indicated that the response can range from no action to mitigation, depending on indoor air concentrations. These compounds are migrating onto the site from an off-site source based on contaminant distribution.

SVOCs, metals, and pesticides were detected in soil samples in excess of 6 NYCRR § 375-6.8(a) Unrestricted Use ("Track 1") Soil Cleanup Objectives (SCOs). The concentrations of lead exceeded the respective comparison criteria by at least an order of magnitude, and several samples exhibited hazardous characteristics based on TCLP lead results. The lead contamination is attributed to historic fill containing ash material brought in from an off-site source to re-grade the site.

Select VOCs, SVOCs, metals, and formaldehyde were detected in groundwater samples in excess of NYSDEC Technical and Operational Guidance Series (TOGS) Ambient Water Quality Standards/Guidance Values. Based on contaminant distribution, the organic constituents are migrating onto the site from an off-site source. The elevated metal concentrations are likely attributable to suspended particulates as the samples were not filtered prior to analysis.

3.13.2 Future Without the Project

This analysis assumes that without the proposed project, the site would remain the same and the redevelopment of the Site with a proposed new school would not occur.

3.13.3 Probable Impacts of the Proposed Project

The proposed project would not result in impacts from contaminated media and building materials. During construction, the contractor would properly manage excavated soil in accordance with all applicable local, State and Federal regulations. Based on the results of waste characterization analyses, material should be disposed as hazardous waste. The contractor would be required to prepare plans for excavated soil management, dewatering, air quality control measures, dust and odor suppression measures and community air monitoring program (CAMP). In addition, to minimize the potential for construction workers' exposure, standard industry practices, including appropriate health and safety measures, would be utilized. A site-specific Health and Safety Plan (HASP) would be implemented during remediation, development and future maintenance activities. The HASP and CAMP would establish procedures for the protection of on-site workers and off-site residents.

A sub-slab depressurization system and a vapor barrier would be made part of the new school construction to prevent the potential migration of organic vapors, if any, into the proposed school building. In all areas of the Site not covered by the building structure, a five-foot-thick layer of environmentally clean fill would be placed over the site soils.