A. INTRODUCTION

Governors Island has been expanded through extensive landfilling. Fill materials may include historical material from the excavations for the Lexington Avenue subway line, ash or other waste materials from industrial processes, and demolition debris. Records indicate past petroleum storage tank removal activities and locations where hazardous materials may have been used. Also, since Governors Island was an active military base for over 200 years (most recently used by the U.S. Coast Guard [USCG] until 1997), historical military uses included a variety of activities (fuel storage, maintenance, etc.) with the potential for hazardous materials impacts; it is also possible to encounter unexploded ordnance. The Proposed Project has the potential to result in significant adverse hazardous materials impacts because it would result in new development in currently unused areas and would require construction activities (e.g., excavation or grading) that would disturb the soil, potentially releasing contaminated dust/fumes or encountering unexploded ordnance.

This chapter assesses the potential for the presence of hazardous materials resulting from previous and existing uses on the 150-acre project site and on the remaining 22-acre portion of the Island that is a National Monument owned and operated by the National Park Service (NPS), and assesses the potential risks to the Proposed Project with respect to any such hazardous materials.

B. PRINCIPAL CONCLUSIONS

Previous studies identified the potential for subsurface contamination and hazardous materials in buildings (such as asbestos-containing materials [ACM] and lead-based paint) at the project site, as follows:

- The historical military uses included warehouses; barracks; arsenals; hospitals; a golf course; offices; an airstrip; potential plane storage and maintenance; and a railroad with a rail yard, locomotive house, ash pit, and locomotive repair spit. The historical site uses may have involved the use and storage of various chemicals, petroleum (including numerous storage tanks, the majority of which have been closed and removed), pesticides, and herbicides.
- Governors Island was historically listed in regulatory databases as a generator of hazardous waste—this was associated with the military uses on the Island.
- Petroleum spills affecting soil and/or groundwater were identified at the project site, and were remediated as part of the USCG base closure activities and closed by the New York State Department of Environmental Conservation (NYSDEC).
- A subsurface investigation conducted in 2011 throughout the project site identified: subsurface contamination generally reflective of urban fill materials (e.g., elevated metal and semi-volatile organic compound [SVOC] concentrations); the presence of pesticides and/or PCBs in soil in portions of the site, likely due to fill materials and/or historical uses; and

evidence of apparent low-level residual petroleum contamination in soil and/or groundwater in portions of the project site.

- Historical records identified the potential for the presence of buried ordnance beneath the project site.
- Based on the age of the on-site buildings, lead-based paint; ACM; and polychlorinated biphenyl (PCB)-containing fluorescent lighting fixtures, electrical equipment and hydraulic equipment may be present.

To avoid significant adverse impacts, the following measures would be undertaken prior to and during construction of the Proposed Project (in both the new park and open space areas and the development zones):

- All subsurface soil disturbance would be performed in accordance with existing procedures relating to potential unexploded ordnance, including the use of ground-penetrating radar prior to conducting excavation.
- During all dewatering required during subsurface work, water would be discharged in accordance with NYSDEC State Pollutant Discharge Elimination System (SPDES) permitting requirements. If necessary, the water would be pretreated prior to discharge.
- All excavated soil and fill materials requiring off-site disposal would be handled and disposed of in accordance with applicable regulatory requirements. Should contaminated soil and/or petroleum tanks be encountered, applicable regulatory requirements (e.g., those relating to spill reporting and tank registration) would be followed to address removal of the tanks and any associated soil or groundwater contamination.
- Any tanks that would be disturbed by excavation activities would be closed and removed, along with any contaminated soil, in accordance with applicable requirements including NYSDEC spill reporting requirements. If historical tanks are discovered, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage record and Spill Prevention, Countermeasure and Control Plan (SPCC) would be kept updated with the status of the tanks.
- All such disturbance would be performed in accordance with a New York City Department of Environmental Protection (NYCDEP)-approved Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP), the scope of which would be based on the findings of the existing studies. The RAP would provide the appropriate clean fill importation criteria and criteria for allowable reuse of excavated site soils (whether in the uppermost layer of landscaped areas or elsewhere), handling, stockpiling, testing, transportation, and disposal of excavated materials, including any unexpectedly encountered contaminated soil and petroleum storage tanks, in accordance with applicable regulatory requirements. The CHASP would ensure that subsurface disturbance is performed in a manner protective of workers, visitors to the Island, and the environment.

With these measures, the Proposed Project would not result in any significant adverse impacts related to hazardous materials.

C. METHODOLOGY

The hazardous materials assessment was based on existing Phase I Environmental Site Assessment (ESA), subsurface investigations:

- *Tracts 01-101, 01-102, 01-103, and 01-104—Level I Pre-Acquisition Environmental Site Assessment Survey and Hazardous Materials Investigation*, Weston Solutions, Inc. (Weston), October 2002;
- *Streamlined Human Health Risk Assessment—Governors Island National Monument Tracts 01-101, 01-102, 01-103, and 01-104*, Weston, May 2004;
- *Phase I ESA*, AKRF, Inc. (AKRF), January 2011, which included the reconnaissance of the site and surrounding neighborhood and reviewed a variety of sources including: current and historical aerial photographs, state and federal environmental regulatory databases, and multiple previous studies listed in *Appendix E* of the Phase I ESA;
- *Site Characterization Investigation Report—Governors Island, New York*; TRC Environmental Corporation (TRC), March 2011;
- *Groundwater Sampling Results—Governors Island, New York*, TRC, March 8, 2011; and

D. POTENTIAL CONTAMINANTS OF CONCERN

Soil and groundwater can become contaminated as a result of past or current activities either on site or on adjacent areas. Subsurface soil and groundwater contamination from the Island's history of military activity can remain undetected for many years without posing a threat to health or the environment. Excavation, earthmoving, dewatering, and other construction or demolition activities can, however, expose the contaminants, provide a pathway of exposure and, if such contaminants are not properly managed, introduce potential risk to construction workers and others.

Demolition of existing structures that have asbestos-containing materials, lead-based paint, or electrical equipment containing PCBs also have the potential to release contaminants if these materials are not properly managed.

Based on the types of contaminants that are typically found in New York City and past and present uses on the Island, some of the potential contaminants of concern are described below. The list provides a summary of categories of contaminants but is not a comprehensive list of all contaminants that could be encountered:

- ***Volatile organic compounds (VOCs)*:** These include aromatic compounds—such as benzene, toluene, ethylbenzene, xylene (BTEX), and methyl tertiary butyl ether (MTBE), which are found in petroleum products (especially gasoline)—and chlorinated compounds, such as tetrachloroethene (also known as perchloroethylene or "perc") and tricholoroethene, which are common ingredients in solvents, degreasers, and cleansers. VOCs represent the greatest potential for concern since, in addition to contaminating soil and groundwater, they can generate vapors that migrate into buildings.
- ***Semivolatile organic compounds (SVOCs):*** The most common SVOCs in urban areas are polycyclic aromatic hydrocarbons (PAHs), which are constituents of partially combusted coal- or petroleum-derived products, such as coal ash and fuel oil. PAHs are commonly present in New York City urban fill materials, which is present under the project site. In addition, petroleum-related SVOCs could be associated with petroleum storage tanks currently or formerly located on-site.
- ***PCBs*:** Historically used in transformers (as a dielectric fluid), some underground high-voltage electric lines, hydraulically operated machinery, and fluorescent lighting ballasts. PCBs tend to travel only short distances in soil.

- ***Pesticides, herbicides, and rodenticides:*** These are commonly used to control rodents, insects, and vegetation in vacant structures or in vegetated areas.
- ***Metals (including lead, arsenic, cadmium, chromium, and mercur*y):** Metals are often used in smelters, foundries, and metal works and are found as components in paint, ink, petroleum products, and coal ash. Metals tend not to migrate far in soil; therefore, they would be of greatest concern near the location where they were generated, are frequently present in fill material throughout the New York metropolitan area. In addition, the age of the buildings on the Island indicates that they may contain lead-based paint, which was allowed for use in New York City residential buildings until 1960, and restricted for use in commercial buildings by the Consumer Products Safety Commission in 1977.
- ***Fuel oil and gasoline from storage tanks*:** The previous studies identified numerous existing and historical petroleum-containing aboveground storage tanks (ASTs) and underground storage tanks (USTs) at the project site. Closed-status petroleum spills were identified in regulatory databases for the project site; additional undetected spills may have occurred.
- ***Fill materials of unknown origin*:** Fill materials are known to exist on the project site, and reportedly consist mainly of excavated material from subway construction and dredging. In the past, waste materials, including coal and incinerator ash, demolition debris, and industrial wastes, were also used as fill in urban areas. Even fill material consisting primarily of soil may exhibit elevated levels of PAHs, metals, PCBs, or other contaminants.
- ***Asbestos:*** Asbestos is a generic name for a group of naturally occurring minerals. Before 1990, these minerals were commonly used in various building materials, such as insulation, fireproofing, roofing, plaster, and floor and ceiling tiles, due to their excellent fire resistance and insulating properties. ACM are classified as friable or non-friable. Friable ACM, such as spray-applied fireproofing and thermal system insulation, are those which when dry can be crumbled, pulverized, or reduced to powder by hand or other mechanical pressure and present a greater health concern than non-friable ACM (such as vinyl floor tiles and some asphaltic roofing materials), as they more readily release asbestos fibers. In 1990, use of most ACM, except some non-friable ACM, was banned by the federal Clean Air Act, but buildings on the Island are likely to contain them because they were built before 1990. In addition to materials within existing structures, subsurface utility lines may be coated with asbestos or encased in the ACM "transite."
- ***Unexploded Ordnance:*** Unexploded ordnance (UXO) may be associated with historical military uses, including shooting ranges, batteries and arsenals. Previous studies have indicated that buried ordnance has historically been found on the Island.

E. EXISTING CONDITIONS

TOPOGRAPHY AND SUBSURFACE CONDITIONS

Based on U.S. Geological Survey (USGS) mapping, the highest point of Governors Island is Fort Jay, located at approximately 40 feet above mean sea level on the NPS-owned portion of the Island. The project site slopes down from Fort Jay to the shores of the Island. Based on past geotechnical studies, approximately 100 acres of the 172-acre Island, mainly the South Island, was created from fill imported by the U.S. Army Corps of Engineers (USACE) in the early 1900s, and is believed to be composed mainly of excavated material from subway construction. Previous studies also indicated that some fill originated from dredging. During past geotechnical studies, the thickness of fill material was noted to range from approximately 5-10 feet in the

north to approximately 40 feet in the south. The fill was observed to include sand with varying amounts of silt and gravel; some demolition debris (such as brick, wood, and cement); ash; coal; and cinders. The fill was underlain by sand, silt, or clay. Bedrock was encountered at depths ranging from approximately 30 to 95 feet below grade, with depth increasing from north to south.

Groundwater was encountered at elevations corresponding to approximately two feet below mean sea level to 13.5 feet above mean sea level. Groundwater flow into the surrounding upper New York Harbor is expected to radiate away from the center of the Island and Fort Jay, but is likely influenced by the historical fill and tides. Groundwater is likely brackish or saline and is not used for potable supply. No potable water supply currently exists on the Island—potable water is imported to the Island by ferry.

HAZARDOUS MATERIALS ASSESSMENT

The previous studies listed in the Methodology section identified the following issues relating to the entire project site. Issues associated with specific buildings/areas are contained in **Appendix C**:

POTENTIAL SUBSURFACE CONTAMINATION

- In 2011, TRC conducted a subsurface investigation of the project site, including the advancement of 50 borings with the collection and laboratory analysis of 104 soil samples and 18 groundwater samples for site characterization, and collection and laboratory analysis of five additional groundwater samples for analysis for NYSDEC Region 2 Dewatering Project Sampling Parameters. The Site Characterization identified concentrations of some metals and/or SVOCs in soils at some locations in exceedance of NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives for Restricted Residential Use (RRSCOs) and/or Part 375 Soil Cleanup Objectives for Commercial Use (CSCOs), which appeared to be attributable to fill materials rather than spills or releases. Concentrations of metals and/or SVOCs above Class GA (drinking water) standards were identified in the groundwater samples, likely due to sample collection methods resulting in sediment particles in the samples rather than contaminants dissolved in the groundwater (groundwater is not and was not historically used as a source of drinking water and is likely saline or brackish). Two pesticides, aldrin and dieldrin, were detected in shallow soil samples above the respective RRSCOs but below CSCOs, likely due to fill materials and/or historical use. Two soil samples from a single boring adjacent to Building 910 contained concentrations of PCBs slightly above the RRSCO and CSCO. Soil in nine borings exhibited some evidence of contamination i.e., elevated VOCs measured with a photoionization detector (PID), odors, and/or staining. Groundwater samples collected from or adjacent to five of these borings also exhibited some evidence of contamination (elevated PID readings). However, no elevated total petroleum hydrocarbons (TPH) concentrations were detected in the soil and no VOCs were detected in soil above RRSCOs or CSCOs, or in groundwater above Class GA standards, indicating that the field observations most likely represented low-level residual contamination. No cyanide was detected in the soil samples above its RRSCO or CSCO. No pesticides or PCBs were detected in groundwater in exceedance of Class GA standards. Six soil and two groundwater samples were analyzed for formaldehyde, which was not detected. Several groundwater samples contained chloride concentrations above the Class GA standard, indicating salty or brackish water.

- Historic uses of the project site included warehouses, barracks, arsenals, hospitals, a golf course, and offices. An airstrip was historically located in the central portion of the project site, and plane storage/maintenance may have occurred on the Island. A railroad was also historically located in the central portion of the site, with a rail yard, locomotive house, ash pit, and locomotive repair pit near Building 902. The historical site uses may have involved the use and storage of various chemicals and petroleum. Additionally, pesticides or herbicides may have been used in vegetated areas and in/around buildings.
- Eight hazardous waste generator listings were identified for Governors Island in regulatory databases. Specific addresses for the listings were either not indicated or where indicated, may not be reflective of the locations where wastes were actually generated and/or stored, however, it is assumed that most of these pertain to the project site rather than the NPS-owned portion of the Island. The wastes included heavy metals; PCB-contaminated solids, liquids, and transformers; benzene, methylbenzene, pentachloronitro-benzene, xylene; and spent halogenated and non-halogenated solvents; and listed several past Resource Conservation and Recovery Act (RCRA) violations (Generators—General, Manifest and Records/Reporting) but all with returns to compliance.
- Historical records noted firing ranges on site, including an indoor rifle range in the attic of Building 400. Previous studies indicated that remediation of the firing range may have been performed. Historical firing ranges, including one at the NPS-owned Fort Jay, may have resulted in elevated lead concentrations in soil.
- The State Petroleum Bulk Storage database listed more than 100 petroleum storage tanks as closed and removed from the project site, in addition to the registrations noted in **Appendix C**.
- Historical records indicated that the Island was expanded to its present 172-acre size in the early 20th century by landfilling using primarily excavated material from subway construction and material from dredging. Elevated concentrations of metals and SVOCs were noted throughout the project site in historical studies including the Weston studies of the NPS-owned area (which included two soil borings on the project site), and generally appeared to be attributable to fill materials.
- Petroleum spills affecting soil and/or groundwater were identified on the project site, and were remediated as part of USCG base closure activities and closed by NYSDEC. Details of the spills are provided in **Appendix C**.

UNEXPLODED ORDNANCE

- A review of historical records identified ordnance storage on the project site, including several underground magazines and a gas attack training structure in or near Building 928. Buried ordnance has been historically found on the Island. A letter from NYSDEC to USCG in November 1997 indicated that NYSDEC reviewed a report regarding the potential presence of historical ordnance and agreed with its recommendations that the potential presence of unexploded ordnance be addressed in property transfer documents, and that precautions be taken during excavation activities in case ordnance is encountered. As such, all subsurface work at the project site is subject to a set of procedures (including the use of ground-penetrating radar) prior to excavation.

HAZARDOUS MATERIALS IN PROJECT SITE BUILDINGS

- Oil-filled transformers, which may contain PCBs, were noted in several buildings. Locked transformer rooms, which may also contain oil-filled transformers, were noted in other buildings. Trash compactors and elevators, which may utilize PCB-containing hydraulic fluids, were also noted on the project site. A potentially PCB-containing hydraulic car lift was historically located in Building 699. The 2008 Phase I ESA noted that a leaking oil-filled transformer was historically located in Building 293 (which has been demolished).
- Apparent oil-like staining was noted in some buildings, but generally appeared to be surface staining which was not likely to have affected subsurface conditions. No staining was noted under ASTs observed on the project site, which are listed in **Appendix C**.
- Previous surveys conducted on the project site identified ACM in site buildings. Although some ACM have been abated, known and suspect ACM remain on the project site. Various damaged suspect ACM were noted in vacant buildings. Suspect ACM in occupied buildings were observed to be in good condition.
- Previous surveys conducted on the project site identified lead-based paint in the buildings. Some painted surfaces in poor condition (with chipped or flaking paint) were observed on the project site. Painted surfaces in occupied areas were noted to be in good condition.

F. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the Proposed Project, all remaining buildings on the South Island and limited buildings on the North Island will be demolished. The site will otherwise continue in its current condition, with limited public access to certain areas.

As described in Chapter 2, “Analytical Framework,” The Trust will undertake several projects to rehabilitate, repair, replace, and upgrade utility infrastructure on the Island in the future without the Proposed Project. These utility infrastructure improvements located throughout the project site would entail subsurface disturbance. Based on the existing studies, subsurface contamination and hazardous materials in buildings (such as asbestos-containing materials and lead-based paint) may be present. Demolition and excavation activities could disturb these hazardous materials and potentially increase pathways for human or environmental exposure. Legal requirements (including NYSDEC regulations) would need to be followed, e.g., relating to maintenance of petroleum storage tanks and handling of ACM, lead-based paint and potential PCB-containing equipment. Specifically, procedures would include:

For Demolition:

- Any active petroleum storage tanks that would continue to be used would be operated and maintained in accordance with applicable regulatory requirements. All other tanks, prior to any demolition activities with the potential to disturb these tanks, would be closed and removed, along with any contaminated soil, in accordance with applicable requirements including NYSDEC spill reporting requirements. If tanks are discovered, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage record and SPCC would be kept updated with the status of the tanks.
- Unless information or test results exist to indicate that damaged suspect ACM do not contain asbestos, these materials would be sampled by a NYC-certified asbestos investigator to determine whether they are ACM. Any damaged ACM would be removed or repaired by a licensed asbestos abatement contractor in accordance with applicable regulations. Known

and suspected ACM would be maintained in good condition in accordance with applicable regulations. Unless information exists to indicate that suspect ACM do not contain asbestos, prior to demolition, an asbestos survey would be completed and all ACM that would be disturbed by the demolition would be removed and disposed of in accordance with local, state, and federal requirements.

- Any demolition activities with the potential to disturb lead-based paint would be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62—Lead Exposure in Construction). Additional requirements even if no disturbance is planned (e.g., tenant notification, inspections and abatement) apply to residential buildings and certain other sensitive uses (e.g., schools and day care facilities).
- Unless labeling or laboratory testing data indicates that suspected PCB-containing fluorescent lighting fixtures, transformers, other electrical equipment, lifts, and elevators do not contain PCBs, and that fluorescent lights do not contain mercury, disposal would be performed in accordance with applicable federal, state, and local requirements.
- Disposal of any chemicals would be in accordance with applicable requirements.

For Excavation:

- All subsurface disturbance would be performed in accordance with the existing procedures relating to potential unexploded ordnance, including use of ground penetrating radar prior to conducting excavation.
- During all dewatering required during subsurface work, water would be discharged in accordance with NYSDEC SPDES permitting requirements. If necessary, the water would be pretreated prior to discharge.
- All excavated soil and fill materials requiring off-site disposal would be handled and disposed of in accordance with applicable regulatory requirements. Should contaminated soil and/or petroleum tanks be encountered, applicable regulatory requirements (e.g., those relating to spill reporting and tank registration) would be followed to address removal of the tanks and any associated soil or groundwater contamination.
- As with demolition, any tanks that would be disturbed by excavation activities would be closed and removed, along with any contaminated soil, in accordance with applicable requirements including NYSDEC spill reporting requirements. If historical tanks are discovered, they would be properly registered, if required, with NYSDEC and/or the New York City Fire Department. The NYSDEC Petroleum Bulk Storage record and SPCC would be kept updated with the status of the tanks.

G. PROBABLE IMPACTS OF THE PROPOSED PROJECT

No building demolition would occur as part of the Proposed Project. The Proposed Project would involve soil disturbance for site improvements, regrading, and new construction. As noted above, based on the existing studies, subsurface contamination may be present. Excavation activities could disturb these hazardous materials and potentially increase pathways for human or environmental exposure.

Impacts would be avoided by performing the excavation-related procedures outlined above for “The Future Without the Proposed Project” and preparing a site-specific RAP and CHASP for implementation during construction and submitted to NYCDEP for review and approval. The RAP would provide the appropriate clean fill importation criteria and criteria for allowable reuse of excavated site soils (whether in the uppermost layer of landscaped areas or elsewhere),

handling, stockpiling, testing, transportation, and disposal of excavated materials, including any unexpectedly encountered contaminated soil and petroleum storage tanks, in accordance with applicable regulatory requirements. The CHASP would ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment.

These measures would be required for any construction associated with the Proposed Project—for both the new park and open space areas and the development zones**.** With these measures, the Proposed Project would not result in any significant adverse impacts related to hazardous materials. ✷