

13.1 INTRODUCTION

This chapter discusses geology, soils, groundwater flow, and seismic activity in the proposed Project area, defined to be the area encompassing the limits of construction, or limits of disturbance (LOD), activities for the Build Alternative. Identifying soil types, surficial geology, and bedrock within the proposed Project area is important for construction planning of the proposed Project. Factors including erosion potential, slope gradient, drainage and run off potential also affect construction planning. The surficial geology must be understood to identify structural support requirements and avoid migration of contaminants that exist on-site (see Chapter 14, “Contaminated Materials”). Additionally, the characterization of hydric soils (i.e., soils that are permanently or seasonally saturated with water for a prolonged period of time) supports the potential for regulated wetlands in the proposed Project area (see Chapter 12, “Natural Resources”).

13.2 METHODOLOGY

The assessment of potential impacts of the Build Alternative includes:

- Review of existing data sources, including: State of New Jersey Geographic Information Systems (GIS) Database; New Jersey Geological and Water Survey guidance; and United States Geological Survey (USGS) maps. To assess the soil units located within the study area, the Soil Survey Geographic Database (SSURGO) and the United States Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) descriptions were utilized.
- Review of data from geotechnical investigation completed in 2017 for Preferred Alternative Project Components A and B.
- Description of the Main Facility site geology, which has been extensively characterized through site-wide soil borings, monitoring wells, and test pits (NJ TRANSIT 2010a).
- Review of maps delineating soil types and depth to bedrock in the proposed Project area.
- Description of the regional geology, tectonic setting and potential for seismic activity.
- A review of the facility’s ability to withstand seismic events.

13.3 AFFECTED ENVIRONMENT

The geology, soils, groundwater and seismology for the Build Alternative are discussed below. A comprehensive geotechnical investigation was completed at Preferred Alternative Project Components A and B between October and December 2017 to inform the project engineers designing the structures for the Main Facility. The preliminary results from these investigations were reviewed to inform the

environmental analysis for this DEIS. In April and May 2018, geotechnical investigations were completed for Preferred Alternative Project Component D in Cedar Creek Marsh South.

13.3.1 Bedrock Geology

The predominant bedrock formation at Project Components A through D is the Passaic Formation, which traverses Pennsylvania, New Jersey and New York (USGS 1996). The Passaic Formation consists primarily of shale, siltstone, and mudstone, with conglomerate and sandstone beds occurring in the New Jersey portions of the formation. Based on a preliminary review of boring logs from the 2017 geotechnical investigation, bedrock in the area of Preferred Alternative Project Component A is encountered on average at approximate elevation of -62 feet (below sea level). Previous NJ TRANSIT projects (Access to the Region's Core EIS in 2008 and Portal Bridge Capacity Enhancement EIS in 2008) included geotechnical borings on the Kearny Peninsula (FTA, FRA 2008; FTA, DOT 2008). In the vicinity of Preferred Alternative Project Component B depth to bedrock is approximately 80 feet below ground surface and just north of the new Kearny Substation (Preferred Alternative Project Component D) location, depth to bedrock is approximately 75 feet below ground surface, according to these previous investigations. Where Preferred Alternative Project Component E exits the Main Facility Site, the electrical lines are within the boundaries of the Passaic Formation, however the Lockatong Formation begins before Preferred Alternative Project Component E crosses the Hackensack River.

The Lockatong Formation, also found in Pennsylvania, New Jersey and New York, is comprised of cyclical lacustrine deposits of silty argillite, laminated mudstone, siltstone, sandstone and an arkosic sandstone facies. In New Jersey, this formation includes diabase and basalt flows. Preferred Alternative Project Component E traverses the Upper Triassic Lockatong Formation, including the arkosic sandstone unit and continues over an igneous rock formation, known as the Palisades diabase, where the Morris & Essex Line's Bergen Tunnel passes through Bergen Hill. Preferred Alternative Project Component E then crosses the Stockton Formation, which is primarily sandstone, siltstone, mudstone with interbedded shale and argillite. In New Jersey, this formation includes conglomerates. Serpentinite is a mapped metamorphic unit that is exposed along the Hudson River near Hoboken at the terminus of Preferred Alternative Project Component E. Both the location of the proposed platform for the emergency generators (nanogrid) at the HBLR Headquarters and the electrical line route option for Preferred Alternative Project Component F are primarily within the Stockton Formation (USGS 1996). The HBLR alignment along which Preferred Alternative Project Component G is located is primarily within the Stockton and Lockatong Formations.

13.3.2 Surficial Geology

Based on a review of boring logs for the recent (2017) geotechnical investigation, six general overburden/historically altered soil units have been identified on the Main Facility site (Preferred Alternative Project Component A): PDM¹³, peat/tidal marsh, clay, sand, and glacial till followed by bedrock. The local subsurface geologic hierarchy where the Main Facility would be constructed may be viewed as three types

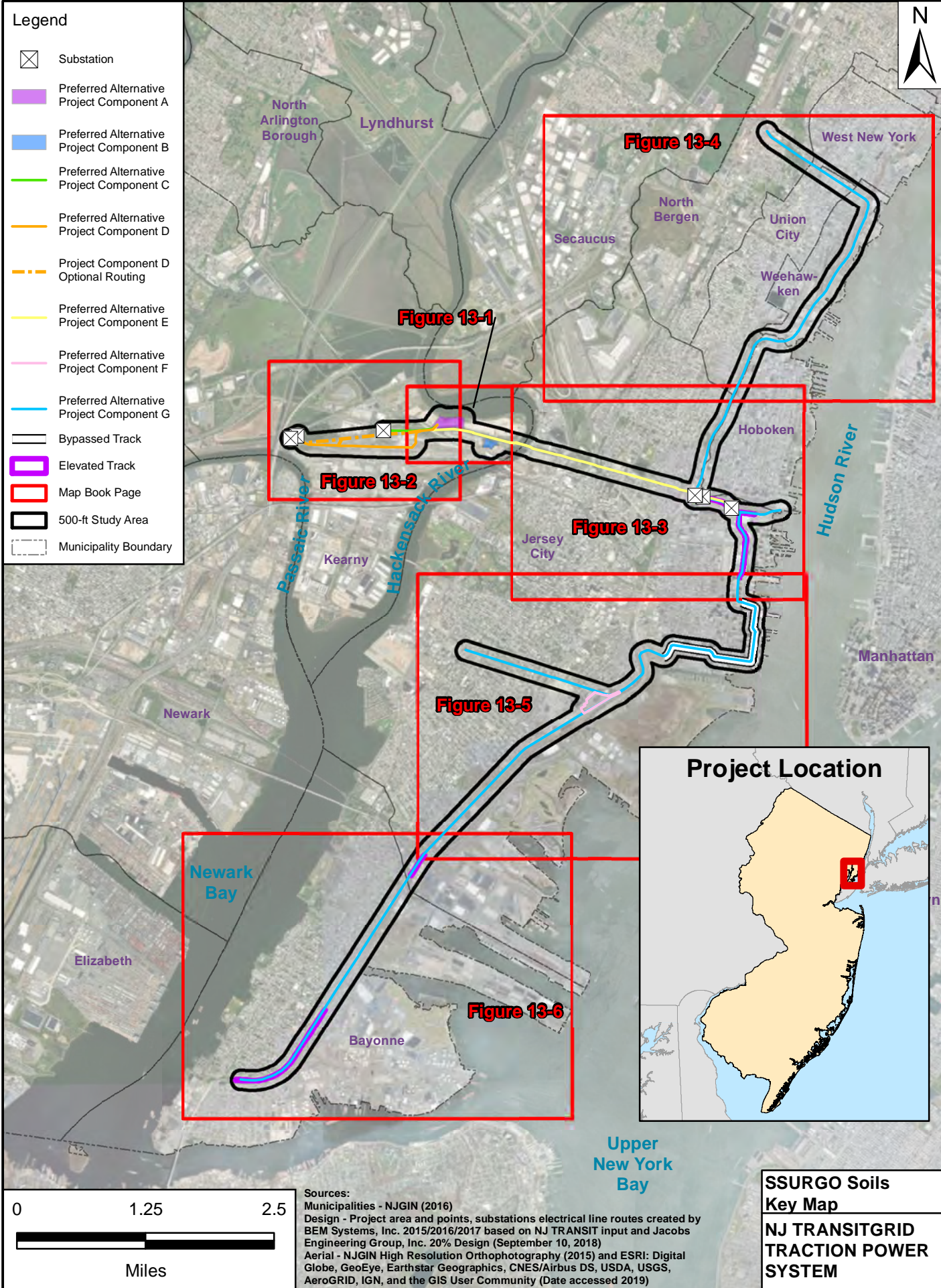
¹³ Processed dredge material, or PDM, is dredge material that has been treated or otherwise processed into engineered structural fill for reuse. At Koppers Koke Site, the PDM has been placed in order to cap existing environmental contamination, preventing it from leaching offsite.















of quaternary unconsolidated materials: 1) upper alluvial and marsh deposits, including PDM and fill materials, 2) glacial deposits from meltwater, and 3) weathered bedrock (Stanford 1995). The overburden subsurface strata are defined as fill (including PDM), peat/tidal marsh, upper sand, varved clay, glacial till, and bedrock. The PDM fill layer was found to range in thickness from 18.5 to 33.5 feet across Preferred Alternative Project Component A, with an average of 28.7 feet thick. The peat/tidal marsh layer is composed of organic soils that include variable amounts of sand, silt and/or clay containing fibrous vegetation. The meadow mat or peat layer is very soft to soft, is highly compressible and has very low shear strength. This unit ranges from 2 to 13.5 feet thick. The upper sand layer beneath the peat layer are alluvial deposits composed of a fine to medium-grained sand unit with variable amounts of silt. This sand layer was not encountered in all borings at Preferred Alternative Project Component A. Where the sand layer was encountered it ranged from 3.5 to 15 feet, with an average thickness of 6.5 feet. The varved clay beneath the upper sand unit is a continuous (confining) layer of varved, or quickly deposited, clay composed of a sequence of lacustrine deposits formed as a result of melting glaciers. The consistency of the stratum varies from soft to very soft and ranges from 16.5 to 48.5 feet in thickness. The glacial till layer mainly consists of varying amounts of gravel, sand, clay or silt and occasional cobbles and boulders. The glacial till is typically dense to very dense and was encountered between 43.5 to 88.5 feet below ground surface and ranged from 13 to 26 feet in thickness. The bedrock layer was found at elevations ranging from -39.9 feet to -85.1 feet (below sea level) and consists of weathered and fractured rock at the interface with the glacial till and transitions to more competent bedrock with depth. The bedrock aquifer consists of fractured sedimentary rocks interlaid with basalt units.

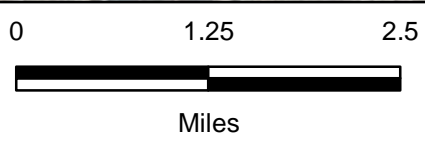
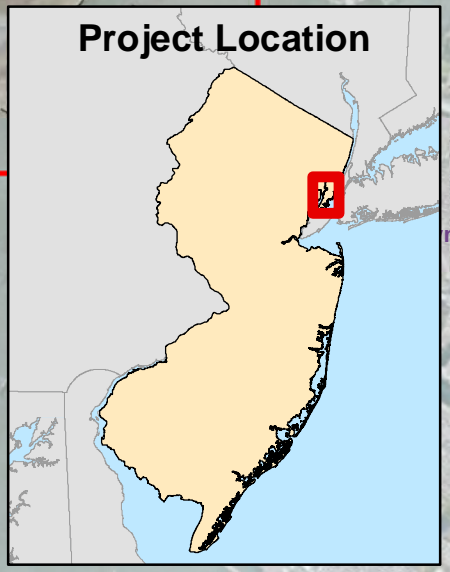
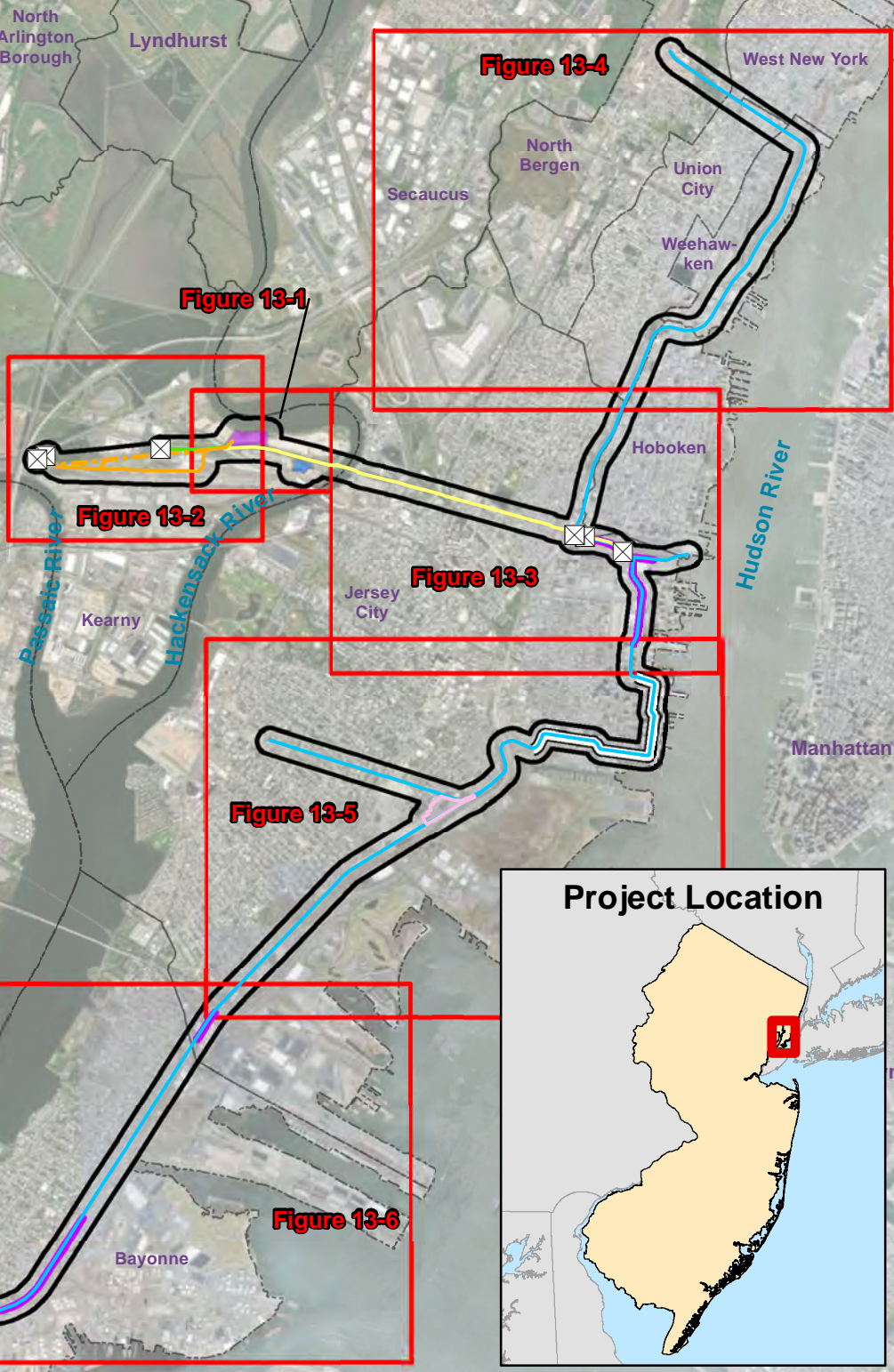
13.3.3 Soils and Topography

The United States Department of Agriculture (USDA) mapped soils are presented in Figures 13-1 through 13-6. As shown on Figures 13-1 and 13-2, the entire Kearny Peninsula is comprised of soil units identified as hydric, according to the NRCS. The Secaucus series (Sec) consists of very deep, moderately well drained soils with moderately low through moderately high saturated hydraulic conductivity. Secaucus soils are on nearly level to gently sloping artificially created landforms, often adjacent to areas of wetlands and waterbodies. These soils comprise human transported material consisting of construction debris intermingled and mixed with natural soil materials which was used to fill wet areas. These soils occur on modified landscapes in and near major urbanized areas of the Northeastern United States, including the location of Project Components A, B, C, D and parts of Preferred Alternative Project Component E. The predominant surficial geologic unit across the Kearny peninsula and into Jersey City is a salt-marsh and estuarine deposit and artificial fill (Stanford 1995). The salt-marsh and estuarine deposit unit consists of organic silt and clay, salt-marsh peat, and some black to dark brown and gray sand with shells (Stanford 1995).

The major soil components located on the Kearny peninsula (Project Components A, B, C, D and parts of E) include the Secaucus artificial fine sandy loam and the Westbrook mucky peat. Both are identified as hydric soils defined by the NRCS as “soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” and are a major component in defining wetlands (USDA Soil Conservation Service [SCS] 1994). Wetlands are discussed in detail in Chapter 12, “Natural Resources.” The Secaucus artificial fine sandy loam is

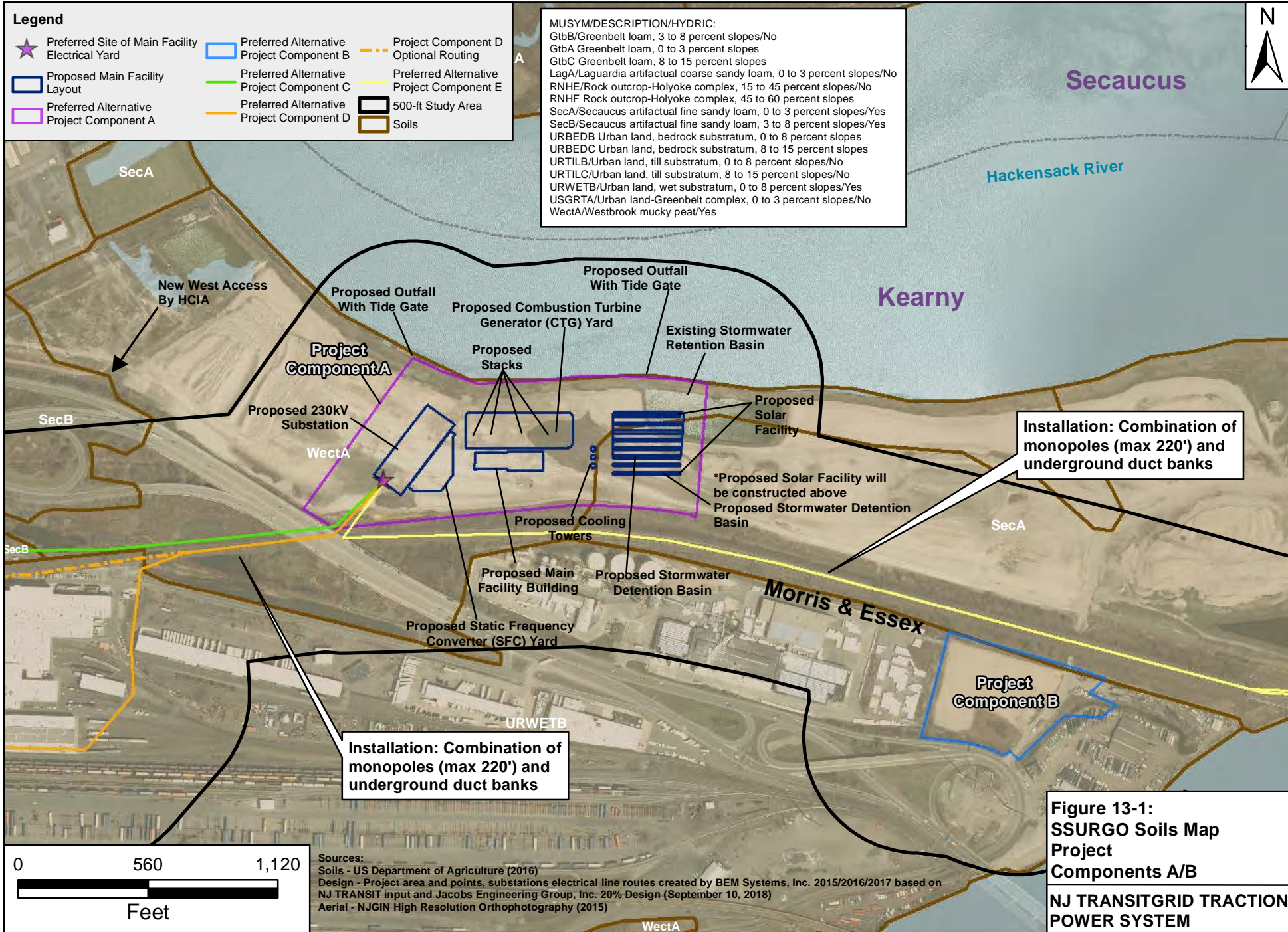


- Legend**
-  Substation
 -  Preferred Alternative Project Component A
 -  Preferred Alternative Project Component B
 -  Preferred Alternative Project Component C
 -  Preferred Alternative Project Component D
 -  Preferred Alternative Project Component D Optional Routing
 -  Preferred Alternative Project Component E
 -  Preferred Alternative Project Component F
 -  Preferred Alternative Project Component G
 -  Bypassed Track
 -  Elevated Track
 -  Map Book Page
 -  500-ft Study Area
 -  Municipality Boundary

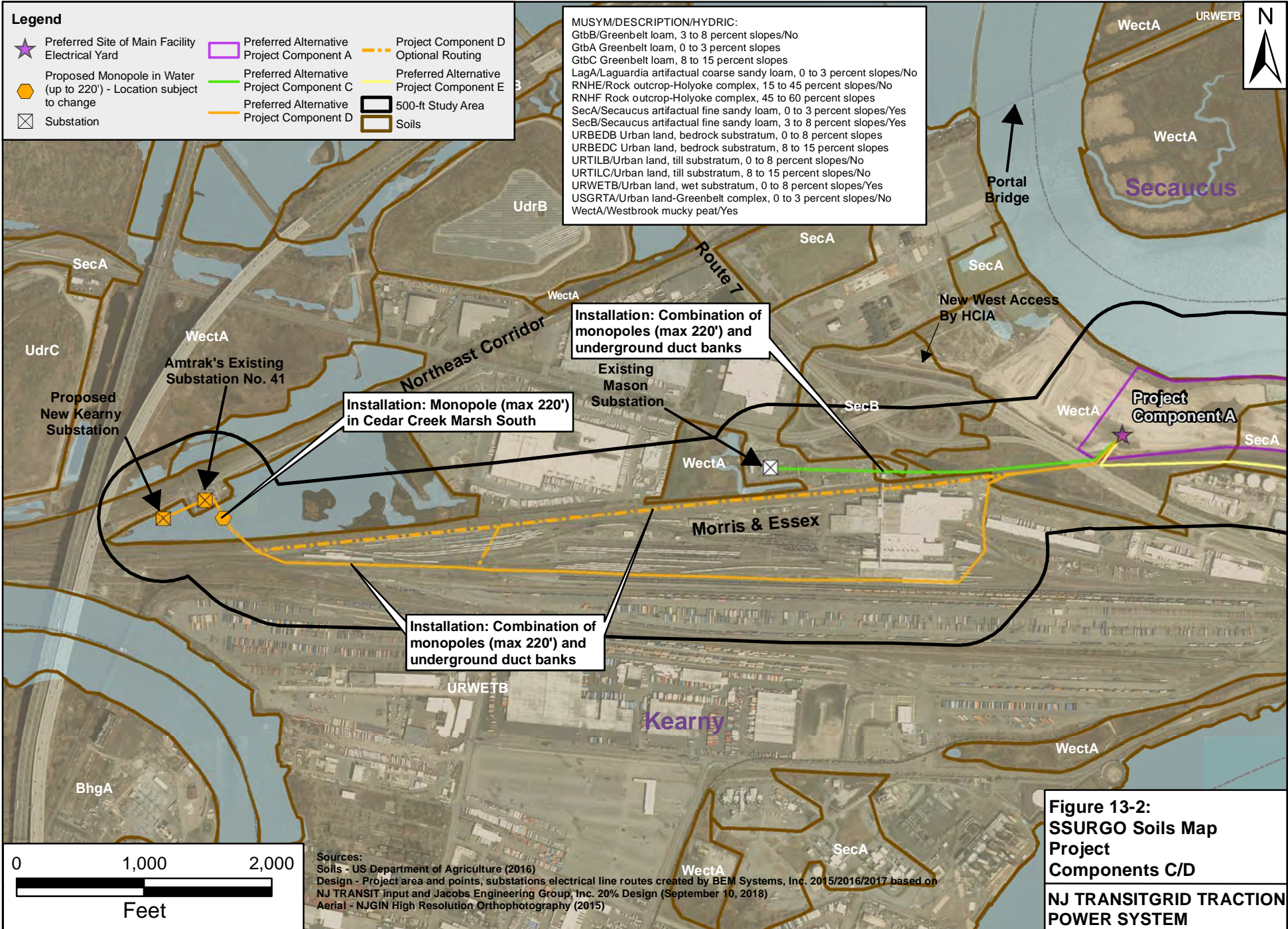


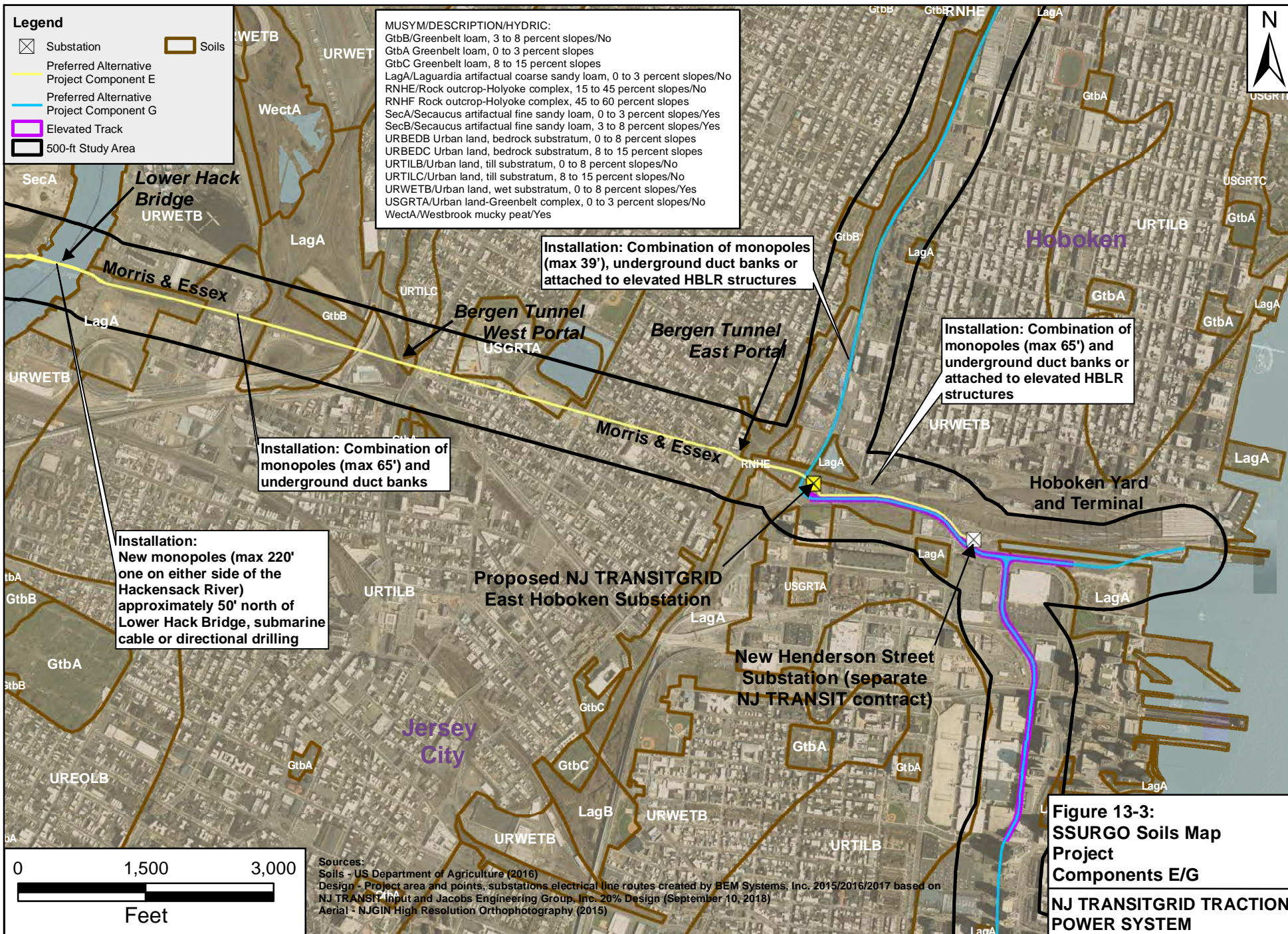
Sources:
 Municipalities - NJGIN (2016)
 Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
 Aerial - NJGIN High Resolution Orthophotography (2015) and ESRI: Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Date accessed 2019)

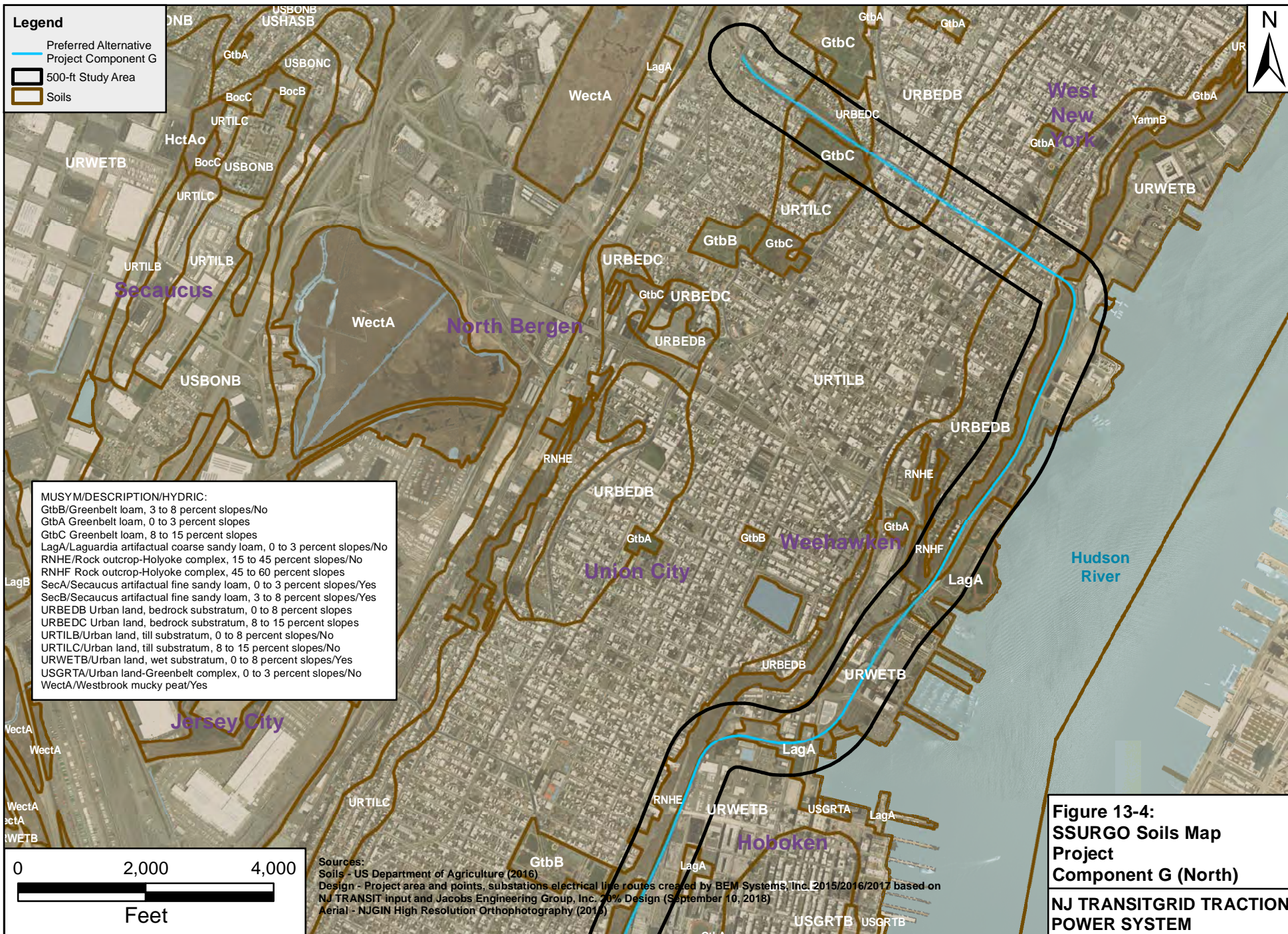
SSURGO Soils Key Map
NJ TRANSIT GRID TRACTION POWER SYSTEM









**Figure 13-1:
 SSURGO Soils Map
 Project
 Components A/B
 NJ TRANSIT GRID TRACTION
 POWER SYSTEM**





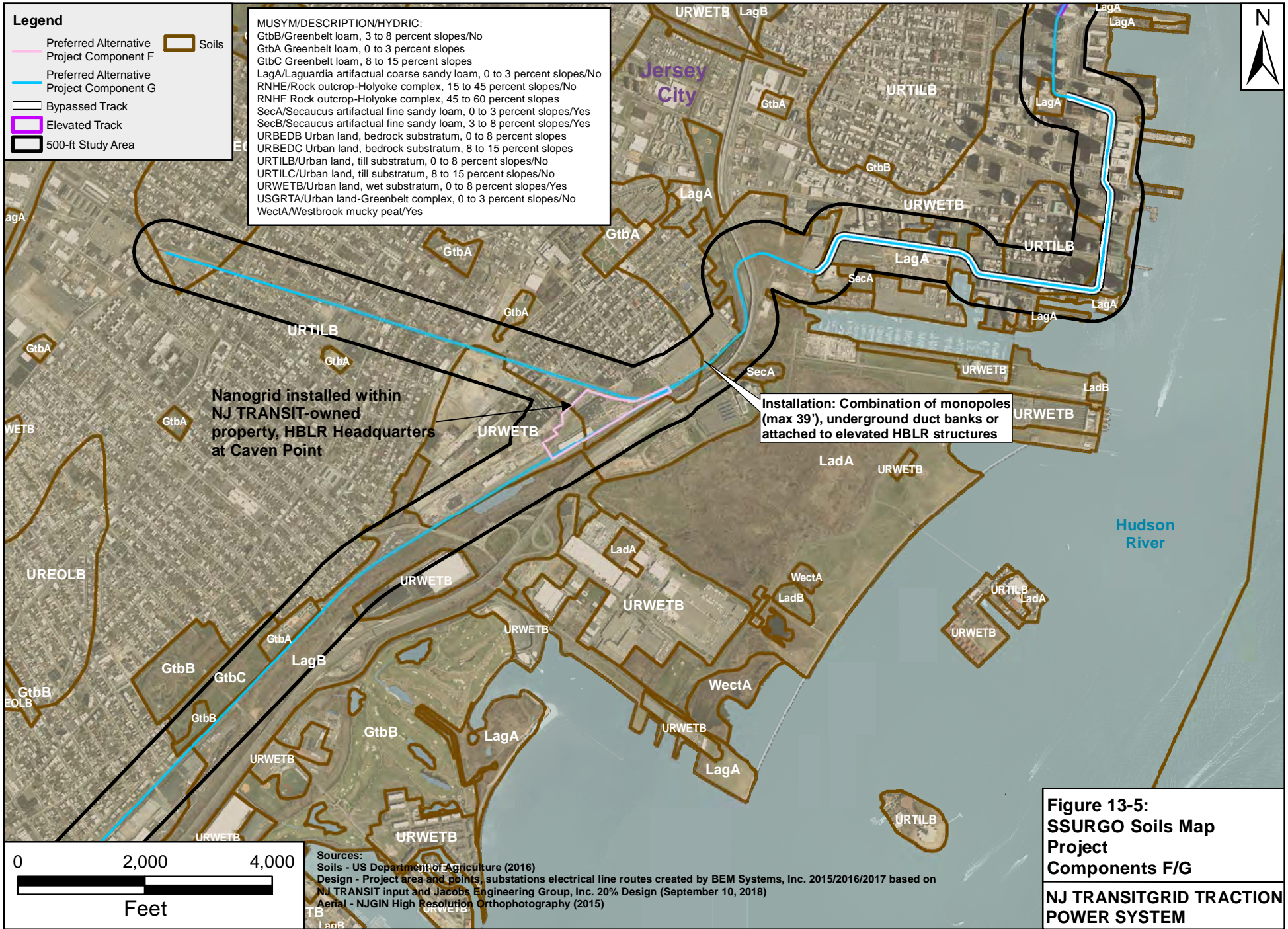


Legend

-  Preferred Alternative Project Component F
-  Preferred Alternative Project Component G
-  Bypassed Track
-  Elevated Track
-  500-ft Study Area
-  Soils

MUSYM/DESCRIPTION/HYDRIC:

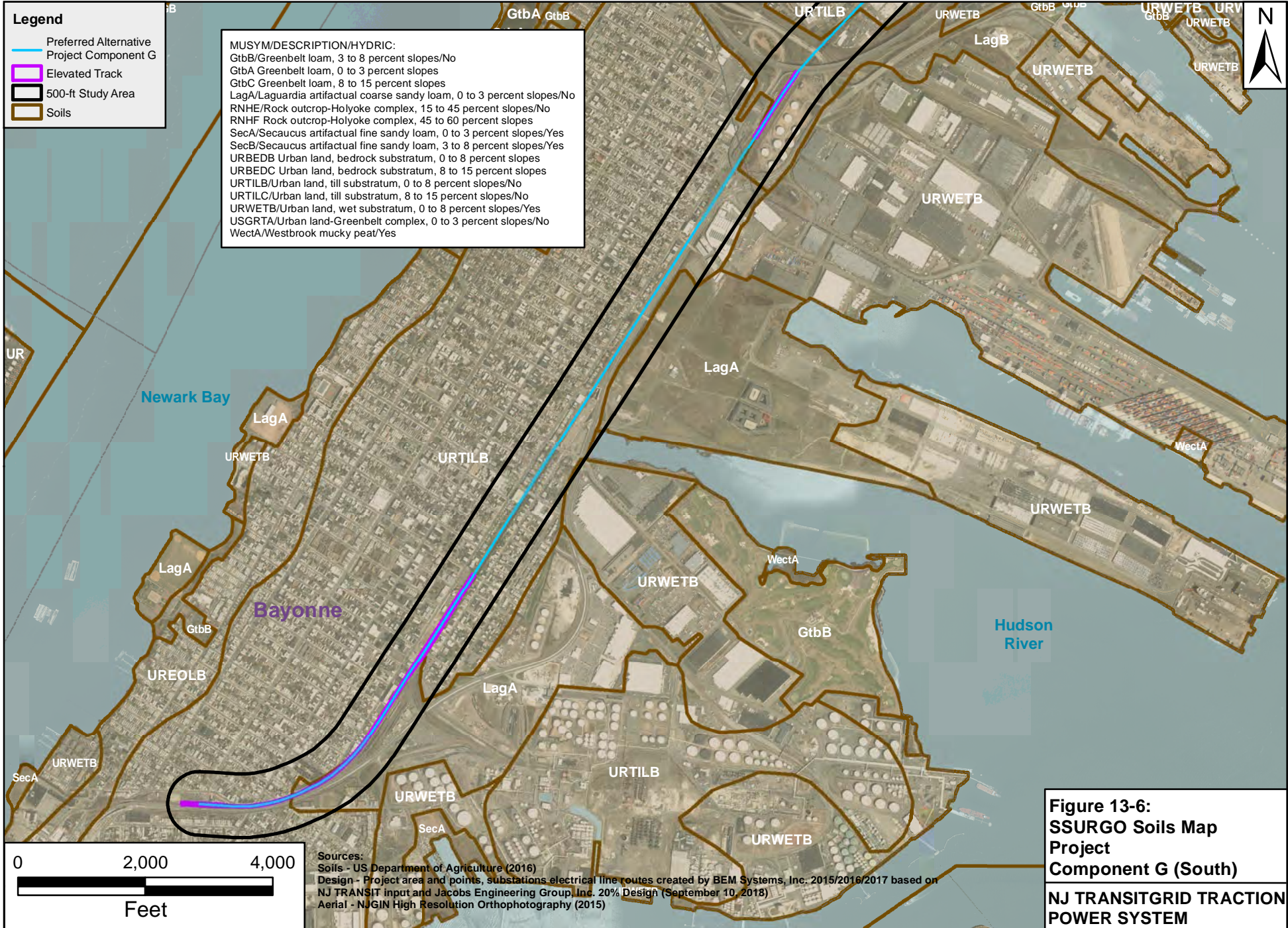
- GtbB/Greenbelt loam, 3 to 8 percent slopes/No
- GtbA Greenbelt loam, 0 to 3 percent slopes
- GtbC Greenbelt loam, 8 to 15 percent slopes
- LagA/Laguardia artifactual coarse sandy loam, 0 to 3 percent slopes/No
- RNHE/Rock outcrop-Holyoke complex, 15 to 45 percent slopes/No
- RNHF Rock outcrop-Holyoke complex, 45 to 60 percent slopes
- SecA/Secaucus artifactual fine sandy loam, 0 to 3 percent slopes/Yes
- SecB/Secaucus artifactual fine sandy loam, 3 to 8 percent slopes/Yes
- URBEDB Urban land, bedrock substratum, 0 to 8 percent slopes
- URBEDC Urban land, bedrock substratum, 8 to 15 percent slopes
- URTILB/Urban land, till substratum, 0 to 8 percent slopes/No
- URTILC/Urban land, till substratum, 8 to 15 percent slopes/No
- URWETB/Urban land, wet substratum, 0 to 8 percent slopes/Yes
- USGRTA/Urban land-Greenbelt complex, 0 to 3 percent slopes/No
- WectA/Westbrook mucky peat/Yes



**Figure 13-5:
SSURGO Soils Map
Project
Components F/G**

**NJ TRANSIT GRID TRACTION
POWER SYSTEM**

Sources:
Soils - US Department of Agriculture (2016)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
Aerial - NJGIN High Resolution Orthophotography (2015)



characterized as a moderately drained soil with varying slopes and medium run-off potential. The Westbrook mucky peat is characterized as a very poorly drained tidal salt marsh exposed to frequent flooding.

The Westbrook (Wect) series is described to be very deep, poorly drained soil series formed from decomposing organic deposits, usually found in tidal marshes subject to daily salt-water inundation. Gradient water flow during saturated conditions is excellent within the upper organic layers, decreasing in conductivity in the lower underlying materials. As such, the soils present within the proposed Project areas on the Kearny peninsula represent typical soils common to freshwater wetlands and historic tidal mapped wetland areas. Hydric soil units are generally associated with wetland areas; however, in highly disturbed, urbanized environments wetlands may no longer exist in areas historically mapped to contain hydric soil units. The majority of Preferred Alternative Project Component A is mapped as Westbrook mucky peat (WectA) and Secaucus artificial fine sandy loam, 0 to 3 percent slopes (SecA). Preferred Alternative Project Component A, however, is confirmed today to be modified by upland disposal of PDM placement. Preferred Alternative Project Component B and the majority of Project Components C and D consist of urban land, wet substratum, 0 to 8 percent slopes (URWETB). As Project Components C and D exit Project Component A, the soils are mapped as Westbrook mucky peat (WectA). At the terminus of Preferred Alternative Project Component D where the new Kearny Substation would be constructed is an open water area, Cedar Creek Marsh South.

The soils along the portion of Preferred Alternative Project Component E into Jersey City (Figure 13-3) are designated as Laguardia artificial coarse sandy loam, 0 to 3 percent slopes (LagA), and urban land, till substratum, 0 to 8 percent slopes (URTILB). The Laguardia series consists of very deep, well-drained soils. Both soil series are described as soils that have been disturbed or reworked over time providing very high runoff potential. Where Preferred Alternative Project Component E exits the Bergen Tunnel, the electrical line route passes through a small area of rock outcrop-Holyoke complex, 15 to 45 percent slopes (RNHE) (Figure 13-3). Preferred Alternative Project Component E in Jersey City is mapped with hydric soils, URWETB, only at the eastern terminus near the new NJ TRANSITGRID East Hoboken Substation and Henderson Street Substation.

For Preferred Alternative Project Component F (Figure 13-5), the emergency generator storage platform for the nanogrid would be installed within the property boundaries of the HBLR-Headquarters facility. Soils at the facility consist of urban land, till substratum, 0 to 8 percent slopes (URTILB) and urban land, wet substratum, 0 to 8 percent slopes (URWETB).

The soils along Preferred Alternative Project Component G (Figure 13-3 through 13-6) consist of Laguardia series artificial coarse sandy loam, 0 to 3 percent slopes (LagA) and 3 to 8 percent slopes (LagB), Urban land, till substratum, 0 to 8 percent slopes (URTILB) and 8 to 15 percent slopes (URTILC). Preferred Alternative Project Component G also consists of Rock outcrop-Holyoke complex, 15 to 45 percent slopes (RNHE) and 45 to 60 percent slopes (RNHF), Urban land, wet substratum 0 to 8 percent slopes (URWETB), Urban land, bedrock substratum, 0 to 8 percent slopes (URBEDB), Greenbelt loam, 0 to 3 percent slopes (GtbA), 3 to 8 percent slopes (GtbC) and 8 to 15 percent slopes (GtbC) and Urban land, eolian substratum 0 to 8 percent slopes (UREOLB). Small pockets of LadyLiberty fine sandy loam with 0 to 3 percent slopes

(LadA) and Secaucus artificial fine sandy loam, 0 to 3 percent slopes (SecA) are also found along Preferred Alternative Project Component G.

The study area's native mapped soil layers as indicated on Figures 13-1 to 13-6 have in certain locations been modified, filled by historic fill activities performed to raise elevations. The "Brownfield and Contaminated Site Remediation Act" (N.J.S.A. § 58:10B-1 et seq. [1993]) requires the NJDEP to map regions of the state where large areas of historic fill exist and make this information available to the public. This map shows areas of historic fill covering more than approximately 5 acres. Historic fill is non-indigenous material placed on a site in order to raise the topographic elevation of the site (Stone, et al. 2002). From the NJDEP's online mapping program, GeoWeb (NJDEP 2017) it is clear that there are historic fill materials at the preferred site of the Main Facility and the six-acre parcel (Preferred Alternative Project Components A and B), areas along the proposed electrical lines proceeding to Mason Substation and Amtrak's Substation No. 41, with the exception of Cedar Creek Marsh South, (Preferred Alternative Project Component C and Project Component D, both Preferred Alternative and optional routing) and along Preferred Alternative Project Component E from the Main Facility site to the Lower Hack Bridge. Historic fill is also present in industrial Jersey City from the Lower Hack Bridge to West Side Avenue along the proposed electrical line route for Preferred Alternative Project Component E. A break in the mapped historic fill is evident along Preferred Alternative Project Component E from West Side Avenue through the Bergen Tunnel. Mapped historic fill is present where Preferred Alternative Project Component E exits the tunnel to its terminus at Henderson Street substation. Approximately two-thirds of the HBLR Headquarters facility is not mapped as historic fill, as historic fill is only present in the southwest one-third of the property. Historic fill is also present along Preferred Alternative Project Component G.

New Jersey is divided into the Valley and Ridge, Highlands, Piedmont, and Coastal Plain Physiographic Provinces. Each province defines a region in which relief, landforms, and geology are significantly different from that of the adjoining and nearby regions. The boundary between each province is determined by a major change in topography and geology. The entire Build Alternative is within the Piedmont Province. The Piedmont Province is an area that makes up about one-fifth of the state of New Jersey. It is mainly underlain by slightly folded and faulted sedimentary rocks of Triassic and Jurassic age and igneous rocks of Jurassic age. The Piedmont Province consists mainly of low rolling plain divided into a series of high ridges (NJDEP 2003).

13.3.4 Groundwater

There are no USEPA designated sole source aquifers (SSA) in the project area. USEPA defines sole source as: *1. The aquifer supplies at least 50 percent of the drinking water for its service area. 2. There are no reasonably available alternative drinking water sources should the aquifer become contaminated.* The build alternative is completely within an undesignated SSA boundary- Hudson County with no SSA. This resource is further discussed as an underlying natural resource in Chapter 12. In addition, the proposed Project has been designed to comply with N.J.A.C. 7:8 Stormwater Management Rules. Water quality and water quantity requirements have been met in accordance with these rules.

Groundwater flow in aquifer systems of the Piedmont Region is described as local with flow path from recharge areas to neighboring groundwater discharge areas. Surficial units are hydraulically connected to the bedrock aquifer. Regional groundwater flow in the bedrock aquifer is to the south following net Hackensack River flow. Groundwater is present under water table conditions in the historic fill, under confined or semi-confined conditions in the upper sand unit, and under confined conditions in the glacial till. The two shallower water bearing units (i.e., fill and sand/silt units) are separated throughout most of the proposed Project area by the meadow mat. However, they are in direct contact where the meadow mat is absent. The deeper overburden water bearing zone, the glacial till, is separated from the upper zones by the relatively thick and continuous varved clay and silt unit.

The presence of four groundwater zones have been identified at the Koppers Koke Site, including three overburden water bearing units (historic fill, sand/silt unit, and till layer) and the bedrock aquifer. Readings obtained from monitoring wells installed in the three different water bearing strata in 1987 and 1997 (prior to implementation of environmental remediation at Koppers Koke Site) indicated that groundwater in the fill material above the impermeable marsh deposits, is at or very close to the then existing ground surface (NJ TRANSIT 2010b). Water levels in the deeper aquifers, measured from deep wells screened in the sand stratum confined between the marsh deposits and the varved clay, and the glacial till stratum confined between the varved clay and bedrock, indicate that the piezometric level in both aquifers is generally at the same elevation as that in the Koppers fill stratum. The depth to groundwater is shallow and present at approximately 8 feet below ground surface (ft bgs) at the shallowest groundwater zone.

This approximate depth to groundwater is applicable to the Preferred Alternative Project Components A, B, C, D and western portion of Project Component E. Appropriate remedial measures (such as double/multiple cased piles) will be used guided under the NJDEP Licensed Site Remediation Professional (LSRP), Site Remediation program and Administrative Requirements for the Remediation of Contaminated Sites (ARRCS) at N.J.A.C. 7:26C-3.3. The depth to the water table varies between 10 to 15 ft bgs throughout the eastern portion of Project Component E, and all of Project Components F and G. As discussed in Chapter 17, measures will be in place during construction to reduce spread of contamination to groundwater.

13.3.5 Seismology

Although they may occur, earthquakes in New Jersey are rare because the existing faults commonly do not break the ground surface. The Ramapo Fault, the most prominent of faults in New Jersey, separates the Piedmont and the Highlands Physiographic provinces, and is located as close as 20 miles northwest of the Main Facility site. Generally, the activity associated with this fault has occurred along the Ramapo Fault Zone, the 10 to 20 miles wide area lying adjacent to, and west of the actual fault. Another fault, referred to as the 125th Street or the Manhattanville fault, begins just south of the George Washington Bridge and cuts along under Queens. This fault has been associated with causing several small earthquakes with a magnitude of 4 or less. These faults are monitored within the Lamont-Doherty Cooperative Seismographic Network (Dombronski 2005)

13.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

13.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. Without the microgrid, commuter and intercity rail service in Amtrak's and NJ TRANSIT's core service territory would remain vulnerable to power outages. Under the No Action Alternative, other planned and programmed transportation improvements for which commitment and financing have been identified would take place by 2021. These include projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA plans for warehousing development on portions of the Koppers Koke property.

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41. Amtrak is also currently proceeding with reconstruction of certain elements of Substation No. 42, located east of the project area at the entrance to the North River Tunnels in Weehawken, NJ, including the installation of a new Control House. Under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the six-acre parcel (Preferred Alternative Project Component B) located south of the Morris & Essex Line (due to a property settlement, as described in Chapter 2, "Project Alternatives"). Under the No Action Alternative, the 20 acres that NJ TRANSIT is acquiring and would likely be used for ancillary railroad purposes which would require some development on the property, creating additional impervious surface in comparison to what exists today.

13.4.2 Build Alternative

At the Main Facility (Preferred Alternative Project Component A), the primary impervious surface will be at the location of the Main Facility Building and associated parking. The remainder of the parcel will be covered with gravel and/or crushed rock, maintaining the current pervious surface. This includes the substation, combustion turbine generator yard and the detention basin underneath the solar panels. The limit of disturbance (LOD) for the new Kearny Substation (Preferred Alternative Project Component D) is a known area of 1.7 acres in Cedar Creek Marsh South. The NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E) and the nanogrid (Preferred Alternative Project Component F) will be constructed on previously developed land and will therefore not increase impervious surface or result in impacts to soils and geology.

All electrical lines would be installed in previously developed land, within transportation rights-of-way. Where electrical lines (Preferred Alternative Project Components C, D, E and G, Project Component D optional routing and the electrical lines for Preferred Alternative Project Component F within HBLR Headquarters property) are installed on monopoles, the construction footprint is relatively small and would not result in adverse impacts to soils or geology. In areas where electrical lines are installed in underground duct banks (maximum of five feet deep), the only impacts to local soils would be during construction, as discussed in Chapter 17, "Construction Effects." There would be no permanent impacts

resulting from installation of electrical lines on monopoles, in underground duct banks or attachment to existing infrastructure (i.e., HBLR bridges).

13.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

Development of the unvegetated and vacant site will eliminate fugitive dust at the Main Facility once the Build Alternative is operational. The Build Alternative would not result in significant adverse impacts related to regional soils and native geology, impede groundwater flow or induce seismologic conditions within the proposed Project or adjoining areas. Mitigation measures for operation of the proposed Project are not warranted.

14.1 INTRODUCTION

This chapter assesses the potential for the presence of contaminated materials in the proposed Project area (defined as the area encompassing the limits of construction activities). This chapter also describes the potential for exposure to contaminated materials during and after construction of the Build Alternative, and the specific measures that would be employed to protect public health, worker safety, and the environment in the event that contaminated materials are present in the proposed Project area. Contaminated materials are defined as potentially harmful substances (hazardous or non-hazardous) that may be present in soil, groundwater, sediment, surface water, air, containers, or building materials and may pose a threat to human health or the environment.

14.2 REGULATORY CONTEXT & METHODOLOGY

There are numerous regulations regarding contaminated materials at the federal and state levels. The applicable industry standards, regulatory requirements, guidelines and rules for contaminated materials handling and investigations are listed in Table F-1 in Appendix F, “Contaminated Materials.”

The assessment of potential impacts of the Build Alternative includes the following:

- Review of environmental databases for known contaminated sites within the project corridor for the Build Alternative and buffer areas of 500 feet, including a buffer area of 500 feet around the NJ TRANSIT-owned HBLR Headquarters. A site reconnaissance of the proposed Preferred Alternative Project Components A and B was also conducted to verify current land uses and to determine the need for further investigation and sampling. A 500-foot buffer on either side of the HBLR right-of-way where utility work is proposed (Preferred Alternative Project Component G) was also assessed.
- Evaluation of potential effects on the remedial elements that are located in the Redevelopment Area both within and outside of Preferred Alternative Project Component A, including: processed dredge material (PDM) surface cover; steel sheet pile wall; slurry walls; the Dense Non-Aqueous Phase Liquid Interim Remedial Measure (DNAPL IRM) system; funnel and gate systems; and the Standard Chlorine Chemical Company (SCCC) pump & treat system.
- Evaluation of the Build Alternative design including consideration of structural pilings that could provide a seepage path for contamination as well as installation practices to avoid seepage of contamination (see Chapter 17, “Construction Effects”).
- A review of construction protocols that would be followed to mitigate the potential for impacts to workers, the public and the environment based on the findings of the environmental database search and known conditions at Preferred Alternative Project Component A.

14.3 AFFECTED ENVIRONMENT

The potential for the presence of contaminated materials within the footprints of Build Alternative is discussed below.

14.3.1 Research Summary

Four reports summarizing the environmental database search was prepared by Environmental Data Resources (EDR) of Shelton, Connecticut (EDR 2015, 2017, 2018a and 2018b) and is provided in Appendix F. To supplement the EDR database searches, the NJDEP's GeoWeb database was also reviewed. Sites were then categorized as either requiring further investigation or not requiring further investigation based on the nature of the contamination and distance from the proposed Project area (NJDEP 2017, 2018). The EDR search and NJDEP GeoWeb review identified 2,815 sites within 500 feet of the Build Alternative that are listed on one or more of the regulatory databases described above as shown on Figure F1 in Appendix F. Of the 2,815 sites identified in the study area, six sites were further evaluated. Of these six sites, four would be impacted by the proposed construction activities: Koppers Koke Site, Meadowlands Maintenance Complex (MMC), Hoboken Yard, and Hudson County Chromate 202 (Caven Point Avenue). The other two sites, SCCC and Diamond Shamrock Corporation (Diamond Shamrock), would not be impacted by the Build Alternative. These six sites are labeled on Figure F1 in Appendix F "Contaminated Materials" and are described in the sections below as well as the rights-of-way that would be impacted during construction.

Additionally, portions of Kearny peninsula are underlain by historic fill and chromite ore processing residue (COPR). This fill may contain elevated levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), dioxins and furans, heavy metals, and hexavalent chromium. In September 2011, the State of New Jersey reached a settlement with Honeywell International, Inc., Occidental Chemical Corp., and PPG Industries, Inc., to establish responsibility for continued cleanup work, finish remediation at specified sites, and remediate COPR waste at 216 "orphan sites" (NJDEP 2011b). There are 51 Hudson County Chromate Sites located within the 500-foot study area of Preferred Alternative Project Components A through G. These are identified in Table F-2 in Appendix F "Contaminated Materials."

Based on previous remedial investigations conducted and the results of the EDR reports analysis, depth to groundwater within the areas of Project Components A, B, C, D and the western portion of Project Component E is shallow and present at approximately 9 feet below ground surface (ft bgs). The depth to groundwater varies between 10 to 15 ft bgs throughout the eastern portion of Project Component E, and all of Project Components F and G.

14.3.2 Sites of Interest

Koppers Koke Site

As explained in Chapter 3, “Land Use, Zoning and Public Policy,” Preferred Alternative Project Components A and B are part of the former “Koppers Seaboard Coke and By-Products Plant,” also known as the “Koppers Koke Site,” within the Redevelopment Area. The Koppers Koke Site is approximately 175 acres and is currently listed under NJDEP Program Interest (PI) Number G000001985. The site is currently owned by HCIA but is being remediated by Beazer East, Inc. (Beazer), the former property owner and responsible party for remediation pursuant to a 1986 Administrative Consent Order (ACO) with NJDEP. The cleanup was being performed under NJDEP oversight in accordance with the 1986 ACO and a 1997 Memorandum of Understanding (MOU) and since 2012 has been overseen by a Licensed Site Remediation Professional (LSRP).

In a letter from NJDEP dated February 8, 2017, NJDEP informed Beazer that the remedial investigation for the Koppers Koke Site is not complete, as river sediments require further investigation. Since Beazer did not meet the requirements for the March 7, 2014 statutory deadline for the completion and submission of the Remedial Investigation Report, the requirements for NJDEP Direct Oversight have been triggered.

Previous remedial investigations conducted at the site indicated contamination within the Redevelopment Area, including: pockets of coal tar dense non-aqueous phase liquid (DNAPL) on the north-eastern portion of the site; chlorinated DNAPL to the west of the site (emanating from the adjacent SCCC site); and COPR fill on the eastern and western areas of the site. The area of Preferred Alternative Project Components A and B are outside the coal tar DNAPL, chlorinated DNAPL, and COPR impacted areas. Site-wide soil and groundwater contamination of VOCs, polycyclic aromatic hydrocarbons (PAHs), cyanide, and metals has been identified and are present within the areas of Preferred Alternative Project Components A and B. Sediment contamination of SVOCs and arsenic was found along the Hackensack River.

Remedial actions have been underway at the site for several years. A steel sheet pile wall was installed around the entire edge of the site adjacent to the Hackensack River. A secondary barrier in the form of a slurry wall runs parallel to the sheet pile wall and an additional wing wall on the eastern portion of the Koppers site. These walls were installed to prevent the DNAPL plume from migrating to the river. An IRM system for coal tar DNAPL recovery was installed in the northeastern portion of the site and is currently still in operation. A funnel and gate system was installed inside the southern property boundary, east of the existing site access off of Fish House Road, to contain the benzene plume in the shallow groundwater emanating from the coal tar. The COPR contamination on site was capped with an impermeable high-density polyethylene (HDPE) geomembrane, which is referred to as a capillary break. The capillary breaks act as a barrier to prevent the hexavalent chromium from contaminating the overlaid fill. The capillary breaks cover approximately 0.27 acres in the eastern area and 7.43 acres in the western area of the Koppers Koke Site. The site-wide soil contamination has been capped with PDM subgrade. Contaminated sediments within 50 feet of the shore were previously removed to a depth of three to five feet. The site has a groundwater classification exception area (CEA) established for the site-wide groundwater

contamination previously identified. A CEA is intended to provide an institutional control for groundwater pollution in a localized area caused by discharge at a contaminated site. The site is listed on the known contaminated site list (KCSL), a list maintained by the NJDEP to provide a record of sites with confirmed soil or water contamination at levels greater than the applicable cleanup standards.

The majority of the remedial action activities have been completed in accordance with the approved Remedial Action Work Plans (RAWPs) including the final placement of PDM. Construction activities for Preferred Alternative Project Component A would impact PDM, soil and groundwater contamination, and portions of the slurry wall and sheet piling. The development proposed by this project would require an LSRP-approved RAWP Amendment to be submitted to NJDEP to inform them of the changes to be made. Beazer would be responsible for all LSRP compliance for Preferred Alternative Project Components A and B.

Meadowlands Maintenance Complex (MMC)

Preferred Alternative Project Components C and D, and the optional routing for Project Component D, are partially located on the MMC property located southwest of the Koppers Koke Site. The 76-acre site is currently owned by NJ TRANSIT and is used for the maintenance of NJ TRANSIT locomotives and passenger rail cars. The site is listed on the KCSL and on the NJDEP Historic Fill database. It is identified as NJDEP PI number 030517 and Mr. William S. Pendexter (License Number 57390) is the assigned LSRP. The Remedial Investigation Report (RIR) was submitted in May 2016 and the Remedial Action Report (RAR) is currently pending. The Remedial Action Regulatory Timeframe is shown as May 6, 2021. Findings have indicated the presence of soil and groundwater contamination consistent with historic fill as well as light non-aqueous phase liquid (LNAPL). LNAPL collection systems were previously constructed at the site; however, they are not currently operational. LNAPL at the site is currently monitored and removed manually if necessary, in accordance with an NJDEP correspondence dated December 16, 2010.

Hoboken Yard

Hoboken Yard is located at the end of Preferred Alternative Project Component E. The site is owned and operated by NJ TRANSIT as a commuter rail terminal, bus terminal, a ferry terminal, and an extensive train maintenance and storage yard, and includes service and inspection facilities, train wash, and crew quarters. The Yard is identified as NJDEP PI number G000005103 and Mr. Mittul Patel, P.E. (License Number: 591566), is the LSRP. The historical record review identified 51 potential Areas of Concern (AOCs). A RI was conducted between March 2015 and August 2017 to delineate contamination within soil, groundwater, sediment, and surface water associated with the AOCs. The site is listed on the NJDEP Historic Fill database and concentrations of PAH and metals in on-site soils and groundwater are consistent with historic fill. Petroleum-related contamination, including residual product, has historically been identified at the site due to past railroad related operations. The Remedial Investigation Report (RIR), which included a CEA application for contaminated groundwater, was submitted to the NJDEP in July 2018. Based on these recent investigations, a deed notice is recommended for impacted soils and will be submitted as part of the RAWP.

Hudson County Chromate Site 202

The Hudson County Chromate “Site 202” is a NJ TRANSIT owned property located at the HBLR Headquarters in Jersey City, where the proposed platform for the emergency generators (nanogrid) would be built. The site is listed on the KCSL and NJDEP Historic Fill databases. It is identified as PI number G000044583 and there is no LSRP assigned. The site has groundwater contamination consistent with historic fill. Petroleum-related contamination has historically been identified at the site due to past railroad related operations, including benzene and VOCs. In 2004, NJ TRANSIT submitted a final RAR to NJDEP for the construction of the HBLR, including the HBLR Headquarters facility on Caven Point Avenue. NJDEP issued a Conditional No Further Action (NFA) Letter on May 3, 2012 for the HBLR Linear Construction Project.

The former Halladay Street Coal Gas PSE&G property has a groundwater CEA in place at the parcel west of the HBLR Headquarters that is 76 acres bounded to the west by Garfield Avenue and to the south by Caven Point Avenue. The plume migrated offsite and encompasses approximately 1.159 acres on the southwest portion of the HBLR Headquarters property. The groundwater contaminants of concern include lead, arsenic, benzene, naphthalene, total xylenes, toluene, ethylbenzene and benzo(a)anthracene. In May 2012, AECOM, on behalf of PPG Industries, Inc., prepared a Preliminary Assessment Report for the site. The report states that soil remedial actions were conducted during construction of the HBLR and that no current AOCs related to presence of chromate chemical processing waste (CCPW) have been identified. No further action was proposed in regards to any further CCPW investigation.

Standard Chlorine Chemical Company (SCCC)

The SCCC property is located along the Hackensack River to the north of the Koppers Koke site. It is identified as PI number G000001583 and there is no LSRP assigned. The 25-acre site was used for chemical manufacturing and processing operations between the early 1900s and the 1990s. The historic operations at the site included manufacturing of naphthalene products, mothballs (dichlorobenzene), drain cleaner products, creosote disinfectants, lead acid batteries, raw rubber parts, and dye carriers. COPR fill from non-site related activity is present on the property and resulting hexavalent chromium contamination is documented on the western portion of the site. The site is also referred to as Hudson County Chromate “Site 116.” The NJDEP identified several AOCs including on-site lagoons, dioxins in soil, VOCs and SVOCs in all media, and groundwater contamination including DNAPL, and contaminated drainage ditch sediment and surface water. Specific contaminants of concern include chromium, VOCs, SVOCs, metals, asbestos, and PCBs, and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The TCDD (dioxin) contamination was reported in the lagoon system and in the former processing area north of the lagoon system. Due to the extensive contamination, the NJDEP placed the site on the KCSL in 1989 and the USEPA placed the site on the Superfund National Priorities List (NPL) in 2007¹⁴.

¹⁴ Superfund, or the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), is a law enacted in 1980 that provides the federal government with the authority to respond directly to releases of contaminated substances that may endanger public health or the environment. Superfund sites are placed on the NPL.

Ongoing remediation activities at the site include construction of a perimeter hydraulic barrier, a groundwater recovery and treatment system for chlorinated DNAPL, lagoon cleanup, sediment cleanup, surface cover as the cap, and storm water management. A CEA has been established for the documented groundwater contamination. The Peninsula Restoration Group, which is composed of Beazer, SCCC, and Tierra Solutions, Inc., is undertaking the investigation and remedial activities associated with the SCCC site cleanup.

Diamond Shamrock Corporation

The 27-acre Diamond Shamrock property is located west of the Hackensack River between the SCCC site and Amtrak's Northeast Corridor. It is identified as PI number G000001974 and has an LSRP assigned. The chromium chemicals manufacturing facility initially engaged in the processing of imported chromite ore for the purpose of producing sodium bichromate for sale and for use in the manufacturing of other chromium chemicals. The site is also known as Occidental Chemical Corporation (successor to Diamond Shamrock) and Chemical Land Holdings. Chromium chemicals manufactured in the plant included chrome-based leather tanning agents, specifically a product sold under the trade name "Tanolin," and chromic acid. AOCs at the site include COPR-impacted site soil, shallow and deep contaminated groundwater aquifers, and the river sediments and surface water. Chromium contaminated material originating from Diamond Shamrock was utilized as fill off-site, which contaminated 40 other sites in Hudson County. The site is also referred to as Hudson County Chromate "Site 113." This site was placed on the KCSL in 1990 and a CEA has been established for the documented groundwater contamination. Tierra Solutions, Inc., is currently completing remediation and redevelopment at the Diamond Shamrock property. A RAWP was submitted May 3, 2018 to NJDEP.

Right-of-Way (NJ TRANSIT)

The proposed electrical line routes (Preferred Alternative Project Components C, D [including optional routing], E, and G) would be constructed along existing rights-of-way. Preferred Alternative Project Components C, E and Project Component D optional routing would run along the Morris & Essex Line right-of-way. Preferred Alternative Project Component D would depart the Morris & Essex Line but would remain within NJ TRANSIT right-of-way through the MMC property and access rail. The electrical power connectivity to the southern portions of HBLR would be through the construction of a small "nanogrid" (two emergency standby generators) on NJ TRANSIT-owned property at the HBLR Headquarters facility (Preferred Alternative Project Component F). Preferred Alternative Project Component G would run along the HBLR right-of-way. Rights-of-way of rail and roadways are known to potentially contain historic fill contamination as a result of fill material imported during construction. Rail rights-of-way are also known to potentially contain low to medium levels of PAHs, PCBs, and metals due to historic rail activities.

During construction of the HBLR, NJ TRANSIT conducted sampling of impacted areas for acquisition and materials management purposes. These investigations indicated that VOCs, SVOCs, PCBs and metals contamination was present throughout the alignment. In 2004, NJ TRANSIT submitted the final RAR to NJDEP for the HBLR project. NJDEP issued a Conditional NFA Letter on May 3, 2012 for the HBLR Linear

Construction Project. As mentioned above, the NFA includes the HBLR Headquarters on Caven Point Avenue.

14.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

14.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. Without the microgrid, commuter and intercity rail service in Amtrak's and NJ TRANSIT's core service territory would remain vulnerable to power outages. Under the No Action Alternative, other planned and programmed transportation improvements for which commitment and financing have been identified would take place by 2021. These include projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA plans for warehousing development on portions of the Koppers Koke property.

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41. Under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the six-acre parcel (Preferred Alternative Project Component B) located south of the Morris & Essex Line (due to a property settlement, as described in Chapter 2, "Project Alternatives"). Under the No Action Alternative, the Build Alternatives would not be implemented and the site would be available for other redevelopment options.

Remediation of the sites described in this chapter is expected to continue in accordance with their respective remedial investigation and remedial action schedules under the No Action Alternative.

14.4.2 Build Alternative

The proposed Project may be enrolled as a linear construction project (LCP) in accordance with NJDEP Linear Construction Technical Guidance, January 2012. An environmental sampling program may include investigation to identify and properly manage potentially contaminated/hazardous materials along the electrical lines (Project Components C, D, E, G, and the electrical lines for Project Component F within HBLR Headquarters property) performed in accordance with the NJDEP *Field Sampling Procedure Manual*, last updated April 11, 2011 (NJDEP 2011a). These activities would comply with the Site Remediation Reform Act (SRRA, N.J.S.A. § 58:10C-1 et seq. [2013]), the Administrative Requirements for the Remediation of Contaminated Sites (ARRCS, N.J.A.C. § 7:26C [2009]), the NJDEP Technical Requirements for Site Remediation (TRSR, N.J.A.C. § 7:26E [2012]), May 2012, and other applicable NJDEP technical guidance documents.

Project Components A and B

At Preferred Alternative Project Components A and B, where environmental conditions are well understood, a limited investigation would be performed to confirm current conditions, status of the remedial actions, and contaminant levels within NJ TRANSIT's acquisition area footprint. The limited

sampling activities would be used to establish current levels of any site contamination that may affect project design and construction.

Based on the records review and past/current land use, it is anticipated that contaminated materials could be encountered during construction if appropriate measures are not in place to avoid encountering contamination. During the installation of the proposed deep piles for the proposed buildings, contaminated soil below the PDM may be encountered. The proposed Project would also require subsurface disturbance in specific areas of Preferred Alternative Project Component A for installation of the storm water, sanitary and water supply systems and construction of the Main Facility's foundation and along the electrical line and gas pipeline routes (see Chapter 17, "Construction Effects").

Operation of the facility would require the handling and storage of fuel and hazardous non-fuel substances (such as ammonia and smaller quantities of industrial chemicals and cleaners used in the regular maintenance of the turbines and exhaust system). Preferred Alternative Project Component A would be designed to meet or exceed all relevant state and federal safety standards. Potential impacts related to fuel management and the handling and storage of hazardous substances needed to operate Preferred Alternative Project Component A are discussed in relation to occupational health and safety considerations in Chapter 16, "Safety and Security."

Project Components C, D and E

The operation of Preferred Alternative Project Components C, D and E, and the optional routing for Project Component D would not have any impacts on contaminated materials. However, the installation of new monopoles and underground duct banks could impact contaminated materials, because these areas are highly industrialized and used mainly for commercial services and transportation. Construction impacts of the proposed Project on contaminated materials are discussed in Chapter 17, "Construction Effects").

Project Component F

The operation of Preferred Alternative Project Component F would not have any impacts on contaminated materials. However, the installation of the foundation pad for the nanogrid could impact contaminated materials, because these areas are highly industrialized and used mainly for commercial services and transportation. Construction impacts of the proposed Project on contaminated materials are discussed in Chapter 17, "Construction Effects").

Project Component G

All Preferred Alternative Project Component G activities would be occurring within previously disturbed areas along the HBLR right-of-way. Limited excavation would be needed to install the utility poles or duct banks. The electrical lines along the HBLR would be installed on new utility poles (up to 39 feet high with a four-foot diameter foundation and depth of 20 feet) and/or within duct banks to a maximum depth of five feet below ground surface. The utility poles would be of similar scale and appearance as the existing infrastructure.

Based on the records review and past/current and use, it is anticipated that contaminated materials could be encountered, as a result of contamination from neighboring properties. The impacts of the construction of the proposed Project on contaminated materials is discussed in Chapter 17, "Construction Effects." No impacts on contaminated materials from the operation of the proposed Project are anticipated.

14.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

No significant adverse effects from the operation of the proposed Project on contaminated materials are expected. Also, as discussed in Chapter 17, "Construction Effects," with appropriate measures in place during construction, no significant adverse impacts from contaminated materials are expected for the proposed Project. The proposed monopoles would require the deepest-drilled foundations of the project, reaching 95 feet in depth to bedrock. When drilling to these depths, double/multi-cased piles will be used to ensure groundwater contamination, or migration of existing contamination does not occur.

With the implementation of the measures discussed above to characterize potential AOCs in the proposed Project area, and the protocols that would be followed for the handling, storage, transport and disposal of potential or known contaminated materials, the Build Alternative would not result in adverse impacts related to contaminated materials. Therefore, no other mitigation measures are needed. The Build Alternative would return a vacant brownfields site to active use, which is a positive net result.

15.1 INTRODUCTION AND METHODOLOGY

This chapter analyzes the Build Alternative for potential effects to utilities and service providers in the vicinity of the proposed Project area, requirements to establish connectivity, allow for distribution, and operations. The existing utility data were obtained from the Redevelopment Plan (NJMC 2013) and the *Property Disposition Request for Proposals* (HCIA 2013), referred to herein as the “HCIA RFP.”

15.2 AFFECTED ENVIRONMENT

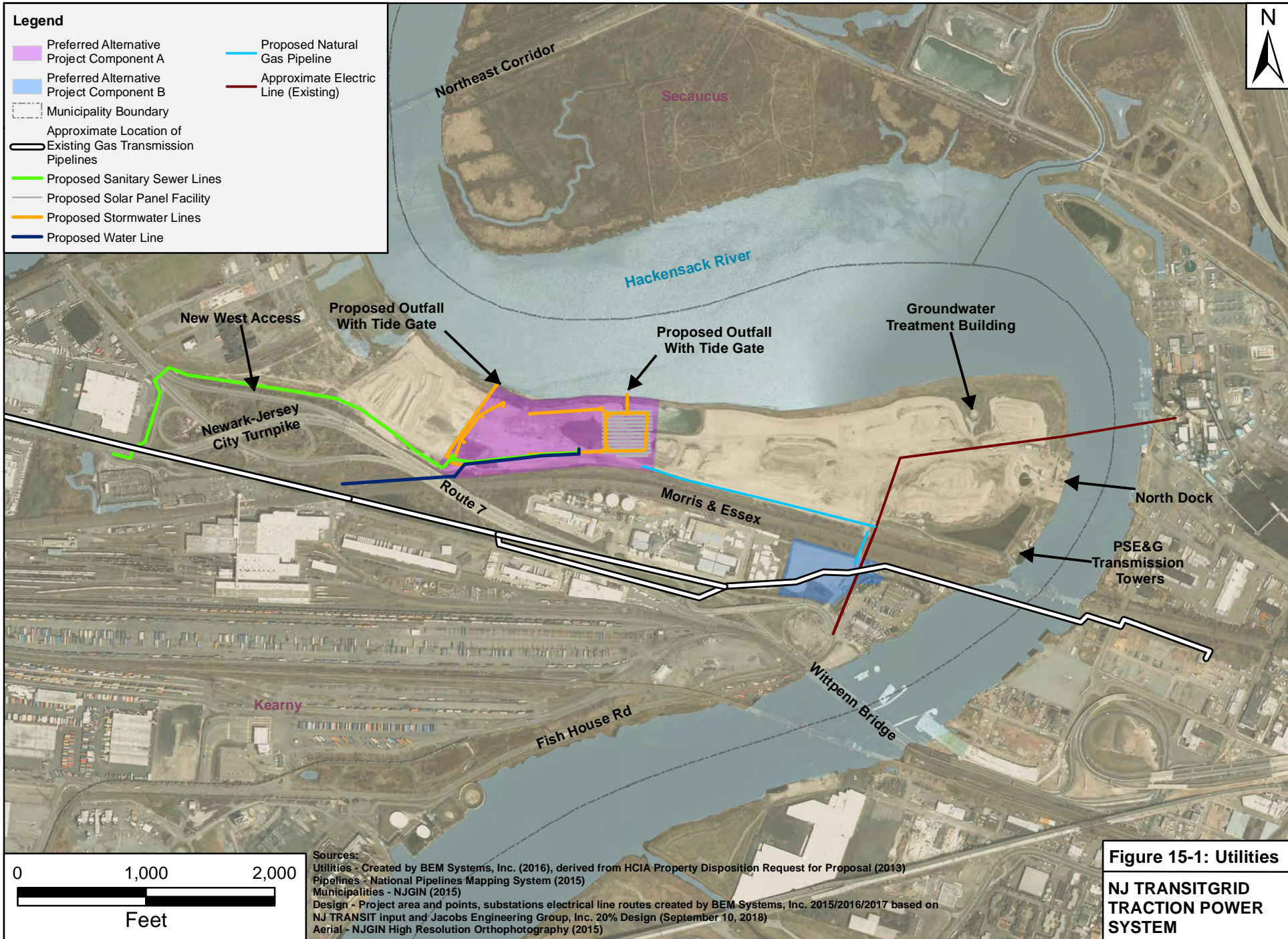
15.2.1 Gas & Electric Services

PSE&G provides electric and gas service in the proposed Project area, including to the Northeast Corridor and the Morris & Essex Line. The proposed Project would occupy only a portion of the 175-acre Koppers Koke Site (20 acres for Preferred Alternative Project Component A, and 6 acres for Preferred Alternative Project Component B). The Koppers Koke Site contains two existing electric services: a cable from the PSE&G Hudson Generating Station and a local service line. According to the HCIA RFP, the cable runs underground from the PSE&G Hudson Generating Station, beneath the Hackensack River, and supplies electricity to the groundwater treatment system on the northeast portion of the Koppers Koke Site. This cable is fully utilized and cannot be used for additional electric service to the site. A local service line was constructed to draw power from the PSE&G Kearny Generating Station, located south of the Project area, to the Great Lakes Dredge and Dock Company (GLDD) (North Dock) facility on the northeast portion of the Koppers Koke Site. This electric service is carried via wooden poles from Fish House Road. In addition, PSE&G holds a permanent easement on the Koppers Koke Site. The easement allows the right to install, maintain and operate two high voltage transmission towers. Two existing PSE&G towers are located on the southeastern corner of the Koppers Koke Site (see Figure 15-1).

Three natural gas pipelines are located on the six-acre parcel of the Koppers Koke Site south of the Morris & Essex Lines (Preferred Alternative Project Component B). Two of these pipelines are owned by PSE&G (16- and 20-inch diameter pipes) and one (12-inch diameter pipe) is owned by Williams Gas Pipeline (formerly TRANSCO). NJDOT is currently implementing the replacement of the existing WittPenn Bridge along Route 7 which traverses the Hackensack River south of the Koppers Koke Site. As part of this project, NJDOT will relocate three existing natural gas pipelines from their current positions along Fish House Road to new locations near the middle of Preferred Alternative Project Component B.

15.2.2 Water Supply & Wastewater

The site previously had a water supply that served the Koppers Koke facility operations; however, it was removed during past demolition of the facilities. There is an existing 42-inch water main line, owned by the Town of Kearny, located southwest of Preferred Alternative Project Component A. The Kearny Water



Department currently has an estimated spare capacity of approximately three million gallons per day (MGD).

The site contains no sanitary sewers and there are no connections to the municipal sewer system available along Route 7. The nearest pump station, operated by Kearny Municipal Utilities Authority (KMUA), is located on Newark-Jersey City Turnpike, just south of the Family Food Distributors, Inc. facility. According to the KMUA, the pump station was designed to accommodate future development, and capacity is both available and expandable at this location. KMUA transmits sanitary flow to the Passaic Valley Sewerage Commission (PVSC) from its existing facilities, according to the HCIA RFP.

15.2.3 Stormwater

Stormwater and surface drainage inputs from rain events are directed overland via existing site topography towards existing stormwater retention basins. The existing stormwater system in the Redevelopment Area relies on these retention basins, which allow adequate soil and particulate settlement for use during remedial actions at the Koppers Koke Site. Following settlement, the stormwater is discharged via overflow drainage pipes to the Hackensack River. Although this system is designed to support a previous undeveloped and remediated site, it does not provide capacity to handle 100 or 500-year storms.

15.3 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

15.3.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. Without the microgrid, commuter and intercity rail service in Amtrak's and NJ TRANSIT's core service territory would remain vulnerable to power outages and there would be a missed opportunity to increase safety and security during power outages. Under the No Action Alternative, other planned and programmed transportation improvements for which commitment and financing have been identified would take place by 2021. These include projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA plans for warehousing development on portions of the Koppers Koke property.

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41. Amtrak is currently proceeding with reconstruction of certain elements of Substation No. 42, located east of the project area at the entrance to the North River Tunnels in Weehawken, NJ, including the installation of a new Control House. Under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the six-acre parcel (Preferred Alternative Project Component B) located south of the Morris & Essex Line (due to a property settlement, as described in Chapter 2, "Project Alternatives"). Under the No Action Alternative, the 20 acres that NJ TRANSIT is acquiring would likely be used for ancillary railroad purposes and the utility improvements discussed in this chapter would not be completed.

15.3.2 Build Alternative

Project Components C through G would not require any connections to municipal water, sewer or electric services and would not affect public utilities. Operation of the Main Facility would require connections to the sanitary sewer, potable water supply, natural gas pipeline, and electric service. NJ TRANSIT would install the required connections as shown on Figure 15-1. Preferred Alternative Project Component F (emergency generators at HBLR Headquarters) would also require connection to natural gas.

For the sewer connection, NJ TRANSIT would install an 8-inch sanitary sewer force main along the HCIA easement that would run parallel to the Koppers Koke Site and then travel south to connect to the KMUA sanitary sewer system along Newark-Jersey City Turnpike, as shown on Figure 15-1. Preferred Alternative Project Component A would generate minimal sanitary sewage due to the relatively few employees needed to operate the facility. An onsite treatment system would be designed to meet the relevant effluent standards for the disposal of generated industrial wastewater, including reject water from the reverse osmosis system. It is anticipated that the existing KMUA sanitary sewer system can accommodate the proposed Project and even full build-out conditions of the entire Redevelopment Area.

There is an existing municipal water supply line outside of the Koppers Koke Site that supplies water to other facilities in the area, including the MMC facility. For connection to this municipal water supply, NJ TRANSIT would install a new 12-inch water main line to connect to the existing 42-inch water main line. The new 12-inch water main line would run parallel to the Morris & Essex Line from Preferred Alternative Project Component A to the existing water supply line, connecting with the existing 42-inch line just north of the Morris & Essex Line and south of Route 7, as shown on Figure 15-1. Water usage for the microgrid's natural gas-fired turbines will require water for cooling purposes as they would be designed with water cooled equipment. Turbine cleaning for the microgrid would require deionized water which would be brought to the facility from outside sources, or generated on-site using a reverse osmosis system to purify the municipal water to industrial standards. The effluent (i.e., reject water) from the reverse osmosis system would be discharged into the sanitary sewer system. This turbine cleaning would be infrequent (e.g., two to three times annually).

The majority of water use for a combined-cycle microgrid is associated with the steam-driven turbine's cooling water load and the associated cooling tower and the water use would vary with ambient temperature. The cooling tower requires water intake to account for blowdown and evaporation. The heat recovery boilers would require water makeup due to steam system losses and blowdown for maintenance of water chemistry. At peak ambient temperature, the cooling tower and the boiler would have a water makeup rate of 850 to 1,000 gallons per minute (gpm), which corresponds to 1.4 MGD. This is expected to vary throughout the year.

Since the Kearny Water Department currently has spare capacity of approximately 3 MGD, the microgrid would be accommodated by the existing service, even under full build-out conditions (proposed warehouses) of the Redevelopment Area. A reverse osmosis system would be used to purify the incoming water to meet industrial standards.

There will be two waste water systems – sanitary and industrial. The sanitary waste water will include general plumbing fixtures, filtered backwash from the reverse osmosis (RO) system, the cooling tower blowdown and boiler blowdown. Cooling tower temperatures will be low (under 140°F) and can drain directly to the sanitary sewer. All boiler blowdown drains will go to a flash tank with aftercooler and use municipal water to cool to the temperature specified in the sewer use permit before discharge into the sanitary system.

The effluent (i.e., reject water) from the reverse osmosis system would be discharged into the sanitary sewer system. This is expected to be less than 12 gpm, or 17,280 gallons per day, for the microgrid. The effluent water discharge will require a PVSC permit for discharging water. Because the supply water is obtained from the municipal water supply, the discharge will not contain any materials above the acceptable permit thresholds for the sanitary sewer wastewater system. Industrial waste water from within the Main Facility building (machinery area and sump pumps for elevators) will pass through an oil-water separator before being discharged to the sanitary waste system. The waste water from the HRSGs will be oil free and will be cooled to temperature specified in the sewer use permit before discharge into the sanitary system. All necessary permits will be obtained by NJ TRANSIT from PVSC and all discharged water will meet the permit requirements prior to discharge.

Regardless of selected equipment, the microgrid would utilize natural gas as a primary source of fuel for its turbines and reciprocating engines. Pipeline-quality natural gas would be delivered via a new interconnection with up to two of the three existing pipelines that traverse Preferred Alternative Project Component B. The new gas line would extend a short distance from Preferred Alternative Project Component A (about 0.5 miles), running eastward along the southern border of the Redevelopment Area, within a utility easement, continuing beneath the Morris & Essex Line through the culvert at the Fish House Road entrance, and heading southward within Preferred Alternative Project Component B to connect to the existing pipelines. The volume of natural gas required for the proposed Project would not reduce the availability of natural gas for other users of the pipelines.

No stormwater from Preferred Alternative Project Component A would enter a public stormwater system. The existing stormwater basin was designed as a sediment retention basin for use during remedial actions at the Koppers Koke Site. The proposed Project would include filling in the portion of the existing sediment retention basin that falls within the 20-acre parcel that will be acquired by NJ TRANSIT. Stormwater from the majority of the 20-acre parcel would be collected via storm drains, processed through a storm water treatment structure, then discharged into the new detention basin, which would be constructed under the solar panel facility. This basin would be dry under normal conditions. The detention basin will be designed to comply with the regulations in the NJDEP Stormwater Best management Practices Manual and NJDEP Stormwater Management Rule (§7 N.J.A.C. 8) for peak flow reduction so that the post-construction peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75, and 80 percent respectively, of the pre-construction peak runoff rates. A new outfall would be constructed north of the solar panel facility/detention basin to drain water from this basin. Stormwater flows would be discharged to the Hackensack River, following sediment settlement periods and inspection of stormwater, including visually checking for sheen. A second outfall would be constructed at the northwest corner of the 20-acre parcel that would collect stormwater from the driveway west of the electrical yard, and discharge it into

the Hackensack River. Project Components B through G would not generate stormwater under normal or emergency operating conditions.

The electrical demand of Preferred Alternative Project Components A and B under the Build Alternative is expected to be negligible since the facility would be self-reliant in terms of electricity while in operation. Under normal operating conditions, the microgrid would be connected to the commercial grid but would self-generate a large portion of the required load for the Energized Assets. During emergency operating conditions (i.e., when the electrical utility grid is disrupted by weather or other events), the connection to the electrical utility grid would be severed (i.e., the microgrid would operate in island mode), to avoid energizing downed lines. The entire plant and distribution system is designed to be autonomous of the electrical grid and will run independently and continuously to support traction loads during emergency conditions. The microgrid will provide full power to the Energized Assets under emergency conditions. These assets are identified in Chapter 2, "Project Alternatives." The Build Alternative would create reinforced and reliable electrical infrastructure, to support immediate and long-term electrical needs for public transportation in the core service territory. The proposed Project is not anticipated to affect existing utility operations, either in terms of availability or pricing.

The nanogrid generators at the HBLR Headquarters (Preferred Alternative Project Component F) would operate only during emergency conditions (i.e., when the electrical utility grid is disrupted by weather or other events), and would operate in island mode, with no connection to the electrical utility grid.

Project Components C, D, E, and G would require electrical lines to be installed. This DEIS evaluated two methods for installation of electrical lines on monopoles up to 220 feet tall or installed via underground cables in duct banks that extend from the Main Facility to the Mason Substation (Preferred Alternative Project Component C), and to the new Kearny Substation (Project Component D), and the portion of Preferred Alternative Project Component E in Kearny. For Preferred Alternative Project Component E in Jersey City, this DEIS evaluated three methods for installation of electrical lines on monopoles (up to 65 feet tall), installed via underground cables in duct banks or attachment to existing infrastructure (i.e., HBLR elevated tracks and bridges). For connections to substations along the northern segment of the HBLR (portion of Preferred Alternative Project Component G) and from the nanogrid (Preferred Alternative Project Component F) to the southern segment of the HBLR (portion of Preferred Alternative Project Component G), this DEIS evaluated electrical lines installed on monopoles (up to 39 feet), installed via underground cables in duct banks and attachment to existing infrastructure (e.g., HBLR elevated tracks and bridges), where possible.

Collectively for the proposed improvements, the three design options evaluated were: 1) all electrical lines installed overhead on monopoles; 2) all electrical lines installed underground in duct banks; and 3) a combination of using overhead (monopoles) and underground (duct banks) options as well as attachment to existing infrastructure. The third design option was selected as the preferred design option based on various site-specific factors, such as access, site constraints, localized geology, areas of known contamination and documentation/survey of existing utilities (both overhead and underground). Since construction impacts to existing utilities (and potential locational conditions) could result in interruptions

to public utilities and/or transportation service delays, the project is being designed to avoid these interruptions by choosing the installation method that best minimizes impacts to existing utilities.

15.4 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

As described above, the proposed Project is not anticipated to affect existing utility operations, either in terms of availability or pricing and there would be no significant adverse impacts on utilities or services as a result of the Build Alternative. Therefore, no mitigation is required. Prior to beginning any construction, NJ TRANSIT will contact New Jersey One Call, as required by state law, to ensure the proper utility companies locate and mark underground utilities in the project area. Additionally, coordination and agreements with local utility authorities and acquisition of sanitary sewer and water main extension/connection permits would be completed, ahead of any construction activities. The proposed Project would provide reinforced and reliable electrical infrastructure to support immediate and long-term electrical needs for public transportation in the core service territory. Existing utilities (and potential locational conflicts) are one of the site-specific conditions that will dictate whether a certain segment of electrical line will be installed via monopoles, duct banks or attached to existing NJ TRANSIT-owned infrastructure (i.e., HBLR elevated tracks). The Project is being designed to avoid all non-NJ TRANSIT utilities to avoid disruptions to private or public customers.

16.1 INTRODUCTION

This chapter discusses safety and security matters related to the operation of the Build Alternative. The microgrid is a specially, and specifically-designed electrical power generating station. The nature of the process of electrical generation involves some risk associated with the machinery and the electricity produced, but the design, scale, and physical location of the microgrid are important factors in assessing the degree of risk to safety and security of the on-site workforce and the public residing and working in the vicinity of the Project area. Although the microgrid would be designed to meet and exceed regulatory standards, and incorporate state-of-the-art cybersecurity protocols, the production of electricity involves the use of regulated materials, transmission of natural gas in an underground pipeline, and a new source of electromagnetic fields (EMFs) near substations and electrical lines. This chapter considers the facility's design in regard to the mitigation of potential hazards, and also provides an accident analysis that evaluates the potential for reasonably foreseeable accidents and intentional destructive acts, such as sabotage and terrorism, in accordance with DOE's 2002 guidance.

The proposed Project would also include a nanogrid, which would provide emergency power generation capacity for the southern portion of HBLR with the generators located on HBLR Headquarters on Caven Point Avenue in Jersey City. This will include two natural gas-fired reciprocating engines that would run two generators that would power the HBLR during emergency conditions when the commercial power grid is unavailable. The nanogrid would be located on the NJ TRANSIT-owned HBLR Headquarters facility, within its secure perimeter.

The proposed Project would improve safety and security in the region by providing a redundant and reliable power source for the electric rail lines operating between New Jersey and New York City job centers. Commuters would be able to rely on continued commuter and light rail services, in the event of widespread power outages, which could require evacuations of densely populated areas.

16.2 AFFECTED ENVIRONMENT

The Main Facility site (Preferred Alternative Project Component A), a part of the larger Koppers Koke Site, is a private property and is not accessible to the public. The current entrance to the Koppers Koke Site at Fish House Road is fenced and HCIA maintains a security booth there. It is important to note that the existing access passes under the Morris & Essex Line via a narrow tunnel with low clearance. This access does not safely accommodate large vehicles and bi-directional traffic. A second access road, free of clearance issues, is proposed at the west end of the Koppers Koke Site (to be constructed by HCIA).

As discussed earlier in Chapter 3, "Land Use, Zoning and Public Policy" the GLDD Company operates a dredged material processing facility at the North Dock of the site. Other active uses include Owens Corning operations at the South Dock (including a liquid material receiving station and pipeline), two PSE&G high-

voltage electrical towers along the river, and a groundwater treatment building in the northeast portion of the site. The Owens Corning receiving station is regulated by the U.S. Coast Guard (USCG), and a transportation worker identification credential (TWIC) card is required for access. The Koppers Koke Site contains soil and groundwater contamination in excess of levels considered safe for public health. A Remedial Action Work Plan (RAWP) was prepared by Beazer East, Inc. and approved by NJDEP, and various elements are being implemented by the Peninsula Restoration Group to contain and remediate contaminants on the site.

Amtrak and NJ TRANSIT facilities are monitored by security personnel and surveillance equipment. Public access is not allowed on railroad property. Flag protection is provided for Amtrak staff working in the vicinity of the Northeast Corridor tracks. NJ TRANSIT maintains a rigorous security protocol, railroad training and flag man requirements, that would be applied to new construction for the proposed Project.

Electrical lines are prevalent throughout the study area. The existing rail alignment is electrified and consequently, there are EMFs directly associated with the rail line as it exists today. Previous studies along portions of Amtrak's Northeast Corridor measured electromagnetic fields up to 15 meters (49.5 feet) from electrified tracks to be an average of 2.0 milliGauss (mG), which is significantly lower than magnetic field strengths of common household appliances (for example, a dishwasher is 30 mG at one foot distance) (Caltrain 2014). There are no permanent dwellings within 15 meters of the tracks in the proposed Project area. Voltages along Preferred Alternative Project Component E to the Henderson Street Substation, and Preferred Alternative Project Component G along the HBLR would be less than the 138Kv Amtrak rail line. Voltages and magnetic fields are directly proportional. The surrounding communities are also served by overhead electric distribution lines providing power to the existing residential, commercial, and industrial facilities in the study area.

16.3 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

16.3.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. Without the proposed Project, commuter and intercity rail service in Amtrak's and NJ TRANSIT's core service territory would remain vulnerable to power outages. Improvements to safety and security in the region (i.e., providing reliable public transportation in the event that New Jersey and New York City job centers need to be evacuated during widespread outages of the commercial grid) would not be realized. Under the No Action Alternative, other planned and programmed transportation improvements for which commitment and financing have been identified would take place by 2021. These include projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA plans for warehousing development on portions of the Koppers Koke property.

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41. Amtrak is currently proceeding with reconstruction of certain elements of Substation No. 42, located east of the project area at the entrance to the North River Tunnels in Weehawken, NJ, including

the installation of a new Control House. Under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the six-acre parcel (Preferred Alternative Project Component B) located south of the Morris & Essex Line (due to a property settlement, as described in Chapter 2, “Project Alternatives”). Under the No Action Alternative, NJ TRANSIT’s safety and security considerations would largely remain the same as they are today and the 20 acres that NJ TRANSIT is acquiring would likely be used for ancillary railroad purposes.

16.3.2 Build Alternative

The combined-cycle plant of the Main Facility would be located on the Koppers Koke Site (Preferred Alternative Project Component A) and would require a natural gas pipeline connection (Preferred Alternative Project Component B). The nanogrid (Preferred Alternative Project Component F) would require a smaller connection to the existing natural gas pipeline within the HBLR Headquarters facility. The Main Facility would include a steam turbine and a heat recovery steam generator (HRSG) boiler, and the active use of steam as a power source for electrical generation. As discussed below, these elements do not increase safety risks for the general public in the Project area but represent additional potential opportunity for accidents affecting workers at the Main Facility. Access to the new Kearny Substation would be restricted due to its location in Cedar Creek Marsh South between the Northeast Corridor and the Morris & Essex Line. Access to the emergency generators for the nanogrid would be restricted due to its location within the HBLR Headquarters facility perimeter.

An employee health and safety program would be implemented for the facility’s operations personnel. It would include regular employee education and training in safe working practices; communication of hazards in accordance with federal, state, and local standards; accident incident evaluations; administrative health and safety procedures; emergency response; fire protection and fire response; and reporting and recordkeeping of safety performance data. Operations personnel would be provided with written safety guidance similar to that used at other project proponent facilities. A first aid station containing basic first aid equipment would be established at several locations around the facility. First aid training would be required for operations personnel. Fences, gates, or barriers, coupled with the use of keying systems, access card systems, or security personnel at entry points, would restrict access to the Main Facility. Use of these physical obstructions and warning signage would effectively deter and delay intruders. Personnel identification and control measures such as photo IDs, visitor passes, and contractor IDs would help to quickly identify unauthorized persons within the facility. Existing security protocols would be followed for the nanogrid engines and generators located at the HBLR Headquarters. It would be contained in a secured fenced location within the facility and would be monitored using existing closed-circuit security cameras.

All operational systems would be designed to provide the safest working environment possible for all site personnel. Design provisions and health and safety policies would comply with Occupational Safety and Health Administration (OSHA) standards and consist of, but not be limited to, the following:

- Safe egress from all confined areas;
- Adequate ventilation of all enclosed work areas;

- Fire protection;
- Pressure relief of all pressurized equipment to a safe location;
- Isolation of all hazardous substances to a confined and restricted location;
- Separation of fuel storage from oxidizer storage; and
- Prohibition of smoking in the workplace.

It is anticipated that maintenance activity would be provided by specialist contractors, trained in the safe undertaking of tasks required to maintain and repair the turbines and electrical distribution system. Day to day facility maintenance workers would receive specific training on the appropriate procedures for equipment inspection and repairs and the limits of their responsibility regarding the systems under separate maintenance contracts. They also would receive first aid and emergency response training with periodic refresher sessions. Maintenance vehicles would carry fire suppression equipment and communications equipment to facilitate contacting back-up emergency response personnel.

In the event of an emergency, services may be provided by various entities, depending upon the nature of the situation (e.g., hazardous materials spill, injured personnel, fire). These entities may include the Town of Kearny Fire and Police Departments, City of Jersey City Fire and Police Departments, Hudson County, NJDEP, USEPA, USCG, and the NJ TRANSIT Police Department (NJTPD).

Hazardous Materials and Fuel Management

The Main Facility would be fueled by natural gas, which would be delivered by high pressure pipeline. The connection from the existing natural gas pipelines to the Main Facility would occur within the six-acre parcel (Preferred Alternative Project Component B) located south of the Morris & Essex Line, east of the Main Facility location. No natural gas would be stored at the Main Facility, and the flow of gas would be monitored by pressure and flow sensors. The natural gas supply to the plant would be automatically shut down by block valves in the event of a natural gas release. The gas pipeline between the connection and the Main Facility would be designed according to federal standards including the Pipeline Safety Act of 1992 and the Pipeline Safety Improvement Act of 2000. Safety specifications include minimum depth cover, pipe wall thickness, design pressures, material selection, and protection from internal, external and atmospheric corrosion.

Hazardous materials would be delivered to the Main Facility and stored in accordance with all applicable regulations and safety requirements. Regulated materials that are likely to be used in facility operations include: lubricants, aqueous ammonia, cleaning fluids and detergents, and water treatment chemicals for the water-cooling tower used in conjunction with a plant configuration that includes steam turbines. As described in Chapter 2, "Project Alternatives," the Main Facility would include a closed loop system for driving the steam-turbine, which would be sourced from the municipal water supplier. Waste water from the cooling towers would be discharged to the sanitary sewer system, after cooling to permit-required temperatures.

Aqueous ammonia, used to control (reduce) the formation of criteria air pollutants, would be stored in two 25,000 gallon, double-walled steel tanks within the 20-acre parcel, near the loading bay. The tanks would be equipped with leak detection equipment. A spill containment facility (curbed area to contain small spills) would be constructed around the truck unloading station, and a curbed containment area large enough to contain spilled ammonia and deluge water would be constructed around the liquid ammonia storage tank. Safety Data Sheets for each onsite chemical would be kept onsite, and facility operator employees would be made aware of their location and content. A spill prevention control plan would be developed and put into effect at the start of operations.

Fire Emergencies

Systems for fire prevention, detection, and control would be installed throughout the building and yard areas as recommended by the National Fire Protection Association (NFPA) and insurance requirements (NFPA 2015). Facility personnel would receive basic fire suppression training to address small fires that could be controlled and/or extinguished with rack hoses and fire extinguishers. If a fire exceeds the resources available, assistance from the local fire department would be requested. To accommodate fire and other emergency services equipment, a secondary access road is necessary and would be developed on the west end of the site. This additional access is necessary because the existing Fish House Road culvert under the Morris & Essex Line does not provide sufficient clearance for large fire trucks and would restrict the bi-directional movement of emergency vehicles.

The proposed natural gas pipeline would be a specific source of potential fire or explosion during project operations. The first line of defense against a natural gas leak is the shutoff valves that can isolate a section of the gas line. Shutoff valves limit the amount of gas that can leak from any breach of the line. Shutoff valves would be installed along the new gas pipeline connecting the Main Facility to the pipeline. A mercaptan (similar to odorant used for propane) is used in the existing natural gas line for leak detection because it has a very strong distinctive odor and makes a gas leak readily apparent. The gas would continue to be odorized and signage would be placed over the new pipeline to reduce the risk of pipeline rupture resulting from unauthorized excavation above or near the buried pipeline. Finally, operating and emergency plans would be prepared in accordance with state codes and regulations, and routine safety inspections would be conducted in accordance with state pipeline safety rules.

Public Health and Safety

Since the Main Facility and new Kearny Substation sites are located in an industrial zone, more than 0.7 miles from the nearest sensitive receptor, issues or concerns regarding public health and safety are limited to: the potential for adverse health impacts from EMF and stray voltage associated with the electrical lines and substations; safety issues associated with electric shock hazard; and the limited and unlikely potential for an incident to affect the use of the Morris & Essex commuter line, affecting the traveling public. The proposed NJ TRANSITGRID East Hoboken Substation is located within Jersey City's redevelopment area but is adjacent to the Morris & Essex Line and the HBLR. Security fencing would be installed prior to construction of the substation and the substation property would remain secured once in operation. The HBLR nanogrid will be installed within the secured perimeter of NJ TRANSIT's HBLR Headquarters on Caven

Point Ave in Jersey City. Potential health impacts related to changes in air quality are addressed in Chapter 6, “Air Quality,” and Chapter 17, “Construction Effects.”

Due to the proximity of the proposed monopoles in Kearny, NJ, to the Newark Liberty International Airport, consultation with the Federal Aviation Administration (FAA) was conducted regarding any potential impact to air traffic from the installation of monopoles. As discussed in Chapter 10, “Traffic and Transportation,” FAA requested that NJ TRANSIT complete FAA’s online Notice Criteria Tool prior to commencement of construction. The plans for the proposed monopoles will be reviewed by FAA’s Obstruction Evaluation process. Since the proposed monopole heights are shorter than other existing infrastructure in the project area, the proposed Project would not create any new obstacles nor have an impact on air traffic. Monopoles will be approved by and registered with FAA prior to construction and will include FAA designated lighting if required.

EMFs

EMFs are electric and magnetic (i.e., electromagnetic) fields. Electric fields describe forces that electric charges exert on other electric charges. Magnetic fields describe forces that a magnetic object or moving electric charge exerts on other magnetic materials and electric charges. EMFs occur throughout the electromagnetic spectrum; they occur naturally and they are generated by human activity. Naturally occurring EMFs include Earth’s magnetic field, static electricity, and lightning. EMFs also are created by the generation, transmission, and distribution of electricity; the use of everyday household electric appliances and communication systems; industrial processes; and scientific research (DOT 2012).

Over the past two decades some members of the scientific community and the public have expressed concern regarding human health effects from EMF during the transmission of electrical current from power plants. A six-year study led by the National Institute of Environmental Health Sciences of the National Institutes of Health and the DOE determined that the overall scientific evidence for human health risk from EMF exposure is weak. This study yielded no consistent pattern of biological effects from exposure to EMF from laboratory studies with animals or with cells. However, epidemiological studies (studies of disease incidence in human populations) had shown a fairly consistent pattern that associated potential EMF exposure with a small increased risk for leukemia in children and chronic lymphocytic leukemia in adults (IFC International 2014). Although a fair amount of uncertainty still exists about the EMF health effects issue, the following determinations have been established from the information:

- Any exposure-related health risk to an individual would likely be small;
- The types of exposures that are most biologically significant have not been established;
- Most health concerns relate to magnetic fields; and
- Measures employed for electromagnetic field reduction can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

Although there are no federal regulations for magnetic fields, New Jersey has guidelines for EMFs associated with transmission lines. The “State Transmission Line Standards and Guidelines” has an Electric Field Edge right-of-way limit of 3 kilovolts per meter (kV/m¹⁸).

The electrical lines for the proposed Project would be designed to minimize EMFs and would emit EMFs at levels similar to, or lower than, other existing electrical lines. EMF strength depends on conductor capacity loads, voltage loads, and distance from source (i.e., from the electrical line). The strength of the field decreases rapidly with distance.

The electrical lines carrying the greatest loads would be from the Main Facility to Mason Substation (Preferred Alternative Project Component C) at 230kV and to the new Kearny Substation at 138kV (Project Component D). These electrical lines would be located entirely within the industrial area and would not result in an increase in EMFs at sensitive receptors. Preferred Alternative Project Component E would have a relatively low voltage of 27kV for the electrical line between the Main Facility site and the new NJ TRANSITGRID East Hoboken Substation. Preferred Alternative Project Component E in Jersey City would extend for 0.22 miles from the eastern portal of the Bergen Tunnel to the new NJ TRANSITGRID East Hoboken Substation above ground in areas of mixed use development with a voltage of 27kV. Where the electrical line departs the new NJ TRANSITGRID East Hoboken Substation, 13 kV electrical lines would connect to the Henderson Street Substation (0.28 miles). The electrical lines traveling along the HBLR right-of-way (Preferred Alternative Project Component G) would also have a relatively low voltage of 13.2kV, compared to other project components. See Table 16-1 below that summarizes the electrical line project components by length and voltage.

Table 16-1 Project Component Electrical Line Voltages

Project Component	Electrical Line Length (Miles)	Voltage (Kilovolts)
Project Component C	0.7	230
Project Component D	1.5	138
Project Component E	3.0	27
Project Component G	14.4	13.2

The strength of EMFs from equipment within the substations, such as transformers, reactors, and capacitor banks, decreases rapidly with increasing distance. Beyond the substation fence or wall, the EMF produced by the substation equipment is typically indistinguishable from background levels.

Due to the relatively low voltage of the Preferred Alternative Project Components E and G these will not adversely affect existing commercial uses or potential future uses. For the Preferred Alternative Project

¹⁸ A volt per meter (V/m) is the standard unit of measure to determine the strength of the electric field. New Jersey’s guidelines limit the electric field to 3kV/m (or 3,000V/m) at the edge of the electrical transmission’s corridor right-of-way.

Component D, the strength of the EMF at 300 feet is minimal at 0.003kV/m (see Table 16-2), which is within the State Transmission Line Standards and Guidelines standard of 3kV/m at the edge of the right-of-way. EMF effects from 230 kV electrical lines for Project Component C, which has the highest voltage electrical line for the proposed Project, are detailed in Table 16-2 as referenced from the “Electric and Magnetic Fields Associated with the Use of Electric Fields.” The EMF levels from lower-voltage electrical lines would be lower than those for the 230kV electrical lines.

Table 16-2 EMF Effects of 230kV Electrical Line

Distance from electrical line (feet)	0	50	100	200	300
Hz(60)-Electric Field (kV/m)	2	1.5	0.30	0.050	0.01
Hz(60)-Mean Magnetic Field (Tesla)	0.00000575	0.00000195	0.00000071	0.00000071	0.00000008

Preferred Alternative Project Components C, D, E, F and G are located in densely developed and industrial areas. The Mason Substation and Project Component D would both be operational at the same time. However, there would be no impact to human health in residential/commercial properties and the public as there is no public access in the area. The installation of electrical lines (both on monopoles and via underground duct banks) for Project Components C, D, and E (in Kearny), are proposed entirely within existing transportation rights-of-way, which already consist of existing electrical infrastructure and are surrounded by industrial and transportation areas. Preferred Alternative Project Component E in Jersey City travels next to the existing Hudson Generating Station and other industrial land uses before entering the Bergen Tunnels. Upon exiting the Bergen Tunnel, Project Component E travels through a heavily developed area of industrial, commercial, mixed use, and high-density residential land uses. Electrical lines installed on monopoles for this section of Project Component E would not have an adverse impact on the adjacent land uses since the electrical lines would be installed within existing rail rights-of-way.

Based on the New Jersey guidance and effects from transmission lines, a setback of 30 feet is suggested for Project Components E and G and a setback of at least 300 feet is suggested for Project Components C and D. For the installation of electrical lines, the preferred design is a combination of monopoles and underground duct banks. Levels of EMF from the proposed electrical lines would be low and would rapidly decrease with distance from the line. Where the electrical lines are installed in duct banks, EMF levels along the route would be indistinguishable from background levels. Based on the build alternative design and the existing development in the Project area, there would be no adverse effects to residential/commercial properties or sensitive receptors.

Electric Shock Hazard

Power lines can cause electric shocks if they are not constructed to minimize the shock hazard. Tension would be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Also, high-voltage electrical lines can cause nearby ungrounded metal objects to become charged. Ground wires and counterpoise wires would be installed to provide lightning strike

protection. The electrical lines would be designed and operated according to the National Electrical Safety Code.

16.4 ACCIDENT ANALYSIS

As defined by DOE's guidance, an accident is an unplanned event or sequence of events that results in undesirable consequences, and may be caused by equipment malfunction, human error, or natural phenomena. The purpose of including an accident analysis in a NEPA document is to inform the decision-makers and the public about the chances that reasonably foreseeable accidents associated with proposed actions and alternatives could occur, and about their potential adverse consequences on human health and the environment.

The DOE recommends a sliding scale of accident analysis related to the type, size, and location of the facility in question. A very large electrical generating plant serving a metropolitan area or a nuclear facility warrants a detailed quantitative accident scenario assessment involving statistical analysis of risk and potential secondary effects. Smaller facilities, such as the microgrid, are more appropriately analyzed qualitatively in a narrative that considers the different components of an accident scenario, the potential for direct and secondary effects of an accident, and mitigation for those effects. Similar to a large-scale analysis, the qualitative accident analysis includes consideration of the probability that the accident would occur and the severity of potential consequences, but these are expressed in qualitative or relative terms.

16.4.1 User Groups Considered

DOE guidance identifies three user groups when considering the potential impacts of an accident related to an energy facility:

- *Involved Workers*: employees located at the precise location where the accident occurred, and those involved in the activity that led to the accident;
- *Noninvolved Workers*: employees located within the facility, but not at the precise location of the accident; and
- *General Public*: residents, workers, and travelers within the potential area of impact for a facility.

The location and restricted access to the Main Facility, as discussed previously in this chapter and preceding chapters, limits the potential involvement of the general public in an accident scenario. The nearest residential development is nearly three quarters of a mile away from the Main Facility (Preferred Alternative Project Component A) and is separated from the Main Facility and the substations by highways and rivers. Other members of the public, including employees of other Koppers Koke Site facilities and transit commuters may be affected, but these impacts are largely anticipated to be inconveniences rather than safety hazards or risks. These situations are discussed below in the narrative for each accident type.

Consequently, the user groups most likely affected by an accident are the workers assigned to the Main Facility (Preferred Alternative Project Component A), the natural gas pipeline connection facility (Preferred Alternative Project Component B), new Kearny Substation (Preferred Alternative Project

Component D), the new NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E) and the nanogrid (Preferred Alternative Project Component F), as these users would be in direct contact with the microgrid or substation systems. As described above, all direct hire staff and contract workers would be trained or hired as experts in their specific responsibilities as well as overall plant safety and emergency response. This preparedness and experience is an important factor in reducing the potential for human-error accidents and in effective accident mitigation and response.

16.4.2 Site Components and Accident Potential

The microgrid incorporates several mechanical systems that may be involved in an accident. All potential equipment configuration options involve natural gas-fired turbines, natural gas-fired black-start engines, generators, and air quality maintenance equipment that requires the use of ammonia. The combined-cycle microgrid also includes one steam turbine and heat recovery systems.

These systems each represent potential points of failure leading to an accident, and in some instances, a failure of one system could result in the failure of additional systems, although this is unlikely. The microgrid would be newly constructed, not a retrofit of an existing facility or building. This approach provides benefits in terms of safety features and standards. All structures and components would be new and manufactured and installed to meet and exceed current safety requirements. Containment areas for regulated materials would be reinforced and designed with secondary containment features to prevent the spread of hazardous materials in the event of a leak or spill during delivery. The ammonia tanks would also be located on the grounds of the Main Facility, not the interior, next to the turbines. The natural gas turbines and exhaust systems, and heat recovery system for the steam turbine(s) would be designed, installed, and operated pursuant to manufacturer's specifications. The pressurized natural gas pipeline would be fitted with emergency shut-offs to isolate the location of a leak or other damage and prevent a larger gas-related incident, and all potential community first responders would be provided critical systems information regarding the components and their location within the microgrid facility to assist in rapid emergency response. Consequently, the potential for a chain reaction incident, where, for example, a natural gas incident leads to the release of ammonia, is unlikely.

The systems and their potential for accident, mitigation, and user groups affected are summarized in Table 16-3.

Table 16-3 Potential Accidents and Mitigation

Element	Accident Risk	Mitigation	User Group Affected
Natural Gas Pipeline	<ul style="list-style-type: none"> • Fire/Explosion • Potential to affect other components through effects of fire 	<ul style="list-style-type: none"> • Emergency Shut-off Valves • Properly Sized and Constructed Conduit • Worker Training 	<ul style="list-style-type: none"> • Involved Workers • Non-involved Workers • General Public <ul style="list-style-type: none"> ○ Commuters ○ Community Responders
Natural Gas Turbines	<ul style="list-style-type: none"> • Fire/Explosion 	<ul style="list-style-type: none"> • Emergency Shut-off Valves • Operation Within Specifications • Worker Training • Regular Maintenance 	<ul style="list-style-type: none"> • Involved Workers • Non-involved Workers • General Public <ul style="list-style-type: none"> ○ Commuters ○ Community Responders
Air Quality System (Ammonia)	<ul style="list-style-type: none"> • Hazardous Material Leak <ul style="list-style-type: none"> ○ Air Quality ○ Water Contamination 	<ul style="list-style-type: none"> • Modern and Reinforced Containment Tanks • Spill Prevention Dam • Location on Grounds, not Interior • Worker Training 	<ul style="list-style-type: none"> • Involved Workers • Non-involved Workers • General Public <ul style="list-style-type: none"> ○ Commuters ○ Community Responders
Heat Recovery; Steam Turbine	<ul style="list-style-type: none"> • Explosion 	<ul style="list-style-type: none"> • Operation within Specifications • Worker Training • Regular Maintenance 	<ul style="list-style-type: none"> • Involved Workers
Natural Gas-Fired Spark-ignition Internal Combustion Engine and Generator	<ul style="list-style-type: none"> • Fire/Explosion 	<ul style="list-style-type: none"> • Emergency Shut-off Valves • Operation within Specifications • Worker Training • Regular Maintenance 	<ul style="list-style-type: none"> • Involved Workers • Non-involved Workers
Electrical lines	<ul style="list-style-type: none"> • Electrical Shock 	<ul style="list-style-type: none"> • Worker Training 	<ul style="list-style-type: none"> • Involved Workers

16.4.3 Potential Accident Scenarios

The preceding analysis describes how the design of the microgrid and worker training would mitigate the potential for accidents; however, to assume that no incidents would ever occur at the microgrid is unrealistic. The DOE guidance requires that a reasonable assessment of possible accidents be presented to the public to inform potentially affected groups of a reasonable worst-case scenario, its impacts, and mitigation.

Given the systems discussion above, accidents at the Main Facility are assumed to fall into four categories: fire, regulated materials release, mechanical failure, and personal injury. The DOE guidance recommends that sabotage or terrorism also be considered; however, given the size and relative low-profile of the Main Facility compared with other potential targets in the area, as well as its isolated location and relatively minimal impact on larger, critical public systems, it is unlikely that the facility would be the target of intentional sabotage or a terrorist attack. Additionally, an act of terrorism or sabotage at the Main Facility would be unlikely to result in an incident different from one of the four categories of accidents potentially occurring at the facility under normal circumstances, such as fire or hazardous materials release.

Fire

Fire represents the accident type with the greatest potential impacts on user groups within the proposed Project area. Fire would most likely be associated with pressurized natural gas and could affect both the six-acre parcel where the existing natural gas pipeline is tapped (Preferred Alternative Project Component B) and the Main Facility itself (Preferred Alternative Project Component A).

It is important to note that natural gas does not spontaneously combust. An ignition source, such as a spark or open flame is required; consequently, the first line of defense in preventing a fire from natural gas is the detection of leaks and prevention of damage to the pipeline and distribution system. Leak detection equipment, pressure gauges, and the use of mercaptan (an odorant) are all methods of identifying a gas leak before a fire can begin. All of these methods would be employed, and the pipeline's location between the six-acre parcel and the Main Facility would be marked and recorded in utility maps. These steps would help to prevent damage to the pipeline from construction equipment used during routine construction and maintenance activity within the Koppers Koke Site.

The potential for an accident involving the natural gas pipeline that would be installed is low due to its secure location and relatively short length. Almost half of all reported accidents involving natural gas pipelines are caused by damage from outside forces, primarily third-party excavation damage (DOT 2016). During the last 20 years (1996 – 2015), third-party excavation damage is responsible for approximately 30 percent of all reported incidents on natural gas pipelines. Other damage from outside forces, such as vehicles not involved in excavation and intentional damage, account for approximately 12 percent of reported incidents. Damage from natural forces, such as earth movement and temperature, account for 5 percent of reported incidents.

In the unlikely event that the gas leak is not detected and a fire occurs, it is highly unlikely that the fire would directly affect user groups outside of the Main Facility. Microgrid workers would be trained in rapid emergency response. Should the incident be too large for the staff, emergency service providers from the adjacent communities (Kearny and Jersey City), would be called to assist. The presence of emergency vehicles within the Koppers Koke Site may affect mobility within the site for third parties, such as the workers at the Owens Corning facility, but given that the Main Facility would be a concrete structure and the source of the fire would be natural gas that can be shut off, it is unlikely that the fire itself would spread to adjacent structures.

As the NJ TRANSIT Morris & Essex Line runs immediately south of the Main Facility, separating it from the Owens Corning facility and other uses to the south, it is possible that NJ TRANSIT may temporarily suspend service on the Morris & Essex Line to help ensure emergency responder safety during an incident and to ensure the safety of commuters and rail service personnel. In this instance, commuting members of the public would be temporarily inconvenienced by the fire, but not harmed. Rail passes and tickets would be cross-honored on NJ TRANSIT buses or other rail lines should this occur.

It is highly unlikely that a fire within the Main Facility would result in the release of liquid or gaseous ammonia, as the ammonia storage tanks are located on the exterior, away from the turbines and gas distribution system and the gas shut-off fail safes would prevent the spread of a fire.

Release of Hazardous Materials

Hazardous materials stored on the site involve ammonia, and smaller quantities of industrial chemicals and cleaners used in the regular maintenance of the turbines and exhaust systems. As described previously under the discussion of fire accidents, it is unlikely that a widespread release of regulated materials would occur in association with a fire at the Main Facility. Human error during delivery and handling of regulated materials is therefore the most likely means by which regulated materials would escape containment.

The ammonia storage areas are designed with containment dams that can hold 110 percent of the stored volume of chemicals, effectively preventing the release of ammonia onto the site and into the Hackensack River. Spilled liquid ammonia readily vaporizes, which presents a serious health concern to workers at the location of a spill; however, proper training would ensure the appropriate worker response to address the spill. Large ammonia spills are treated with water, which would be readily available on the Main Facility site. It is unlikely that sufficient quantities of ammonia would spill and vaporize before emergency response actions occurred such that residential areas in Kearny or Jersey City would be affected by ammonia vapors. Two 10,000 gallon tanks would be used to store 19% aqueous ammonia. Aqueous ammonia is safer than gaseous ammonia and is composed of ammonia and water and, due to the diluted nature of the aqueous ammonia, it is safer than gaseous ammonia. Gaseous ammonia, which is a toxic gas, will not be used for the proposed Project. In addition, in the event of a worst-case scenario such as a historic rainfall event or a minor spill, the double-walled stainless-steel tanks are located within a secondary catch basin, which are designed to contain the entire volume of the tanks and allow for safe handling.

Mechanical Failure

The microgrid involves complex industrial equipment, including engines and turbines that use combustion of natural gas to generate electricity. Complex machinery may suffer a malfunction and result in an accident; however, there is no one mechanical element or system that is more likely than another to fail, particularly in a newly-constructed facility. Additionally, at the worst, it is assumed that a mechanical failure could lead to a fire or release of regulated materials, and as discussed previously, both of these potential accident types are mitigated by design features and systematic fail-safes incorporated as part of

the Main Facility. Consequently, while mechanical failures may occur, they are unlikely, and their effect would be confined to on-site workers and those within the immediate vicinity.

Personal Injury

The Main Facility and the electrical distribution system it feeds represent complex industrial systems that are highly hazardous to individuals without proper training and experience. That said, these systems are no more dangerous or unusual than any other industrial application of technology, and similar to other industrial processes, the microgrid presents nearly no risk of harm to the general public provided they avoid the systems by adhering to posted safety signage and avoiding trespass on restricted locations, including the Main Facility site, substation locations, and railroad rights-of-way.

Workers at the Main Facility and electrical system personnel would be trained and equipped with personal protective equipment (PPE) and training appropriate to their specific task so as to conduct those activities safely. Accidents involving injury from interaction with machinery or electrical systems may still occur, but these incidents are expected to be isolated incidents confined primarily to the affected worker.

The accident analysis for the four categories are summarized in Table 16-4.

Table 16-4 Accident Analysis Summary

	Fire	Hazmat Release	Mechanical Failure	Personal Injury
Affected Populations	Involved Workers Non-Involved Workers General Public (Commuters)	Involved Workers Non-involved Workers General Public (Commuters)	Involved Workers	Involved Workers
Critical Systems/Features	Mechanical On-site Site Access	Mechanical On-site Site Access	Mechanical On-site	Low to none
Potential for Serious/Widespread Impacts	Moderate	Low	Low to None	Low to None
Likelihood of Occurrence	Unlikely	Unlikely	Less Likely	More Likely

Other Potential Accident Types

Flood

There is a low probability that the Main Facility site would flood since it has been elevated above the 100 and 500-year floodplain elevation. HCIA has prepared approximately 126 acres of the Koppers Koke property for development by significantly elevating the site above NJ TRANSIT’s design flood elevation (DFE) criteria of 2.5 feet above BFE. The DFE for the Main Facility would be +13 feet NAVD88, which is +4 feet above the 100-year flood elevation and +2.5 feet above the more conservative DFE criteria of BFE+

2.5 feet based on the criticality of the infrastructure. All generating equipment would be on pedestals inside of the power plant facility building and therefore further protected and elevated.

Computer System Threats

In addition to physical security, the computers in the Main Facility would be protected against cyber threats (i.e., hackers attacking computer control systems and information). Access to control systems would be managed to protect critical assets and information as well as maintain the reliability of the electric infrastructure. This includes logical access (user password protection) to computers and networks and physical access to computer rooms. Policies and procedures would be established to manage authorization and authentication as well as monitor and record both logical and physical access. Firewalls and antivirus software would be installed and proactively maintained. Intrusion detection systems would be implemented and cyber risks regularly evaluated.

16.5 SAFETY AND SECURITY DURING ISLAND MODE OPERATIONS

Under normal operations, the Main Facility will operate parallel to the commercial electric grid. During this operational mode, the regional power grid would provide frequency stabilization to the power output from the Main Facility, to absorb fluctuations caused by starting and stopping locomotives as described in Chapter 2, "Project Alternatives." During a commercial electric grid outage, due to extreme weather or other events, the Main Facility will automatically disconnect from the commercial grid and enter into island mode of operations, and the frequency fluctuations will be controlled internally, using rapidly responding governors to manage stable power output. During this operational mode, some emissions controls will be unavailable. When the commercial electric grid returns to service and stabilizes, in coordination with PSE&G operations, NJ TRANSIT would initiate connection back to the commercial grid. Once reconnected, the turbines would automatically be placed back into normal operations. This change in operational mode is automatic, and therefore would not present additional safety concerns or require additional staff during emergency operations.

The existing safety equipment at the site, including emergency cutoffs and fire suppression systems would remain operational. In case of an incident that cannot be controlled by on-site staff, local police and/or fire departments would be contacted. Since the plant is designed to be self-sufficient, no internet connection is necessary for operations of the proposed Project. Operational software would be installed on a local area network (LAN) behind a firewall. NJ TRANSIT Corporate software would be on a separate network from the operational network. The two networks would operate independently from each other. If the commercial telephone system is interrupted, fiber optic wiring between the Main Facility, the HBLR Headquarters, and Rail Operations Center can be used for communications.

Since the Main Facility, new substations and the emergency generators at HBLR Headquarters are designed to be self-sufficient, no additional staff would be required during island mode operations. However, the signals for the at-grade crossings of the HBLR would not be powered during a commercial power outage. These crossings would be blocked from road traffic or manned with police to direct traffic prior to startup of HBLR through operations during emergency conditions. Additional communication between NJ TRANSIT and Amtrak would also be required to coordinate rail traffic.

16.6 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

NJ TRANSIT has an extensive safety and security program and takes every precaution to ensure the safety of the public and its workers. To further advance its safety and security goals, NJ TRANSIT established the Office of System Safety in May 2014. The Office of System Safety was formed to monitor, review, and evaluate safety measures, programs and incidents across the system, as well as overall safety statistics and the development of safety programs pertaining to NJ TRANSIT's operations and facilities. The NJTPD is the only transit policing agency in the country with statewide authority and jurisdiction. The NJTPD's mission is to maintain public order and safety while deterring and preventing terrorism and crime throughout the NJ TRANSIT system. The NJTPD Intelligence Unit, with support from others, completed a NJTPD Counterterrorism Risk Assessment, Countermeasure Analysis and Security Cost Benefit Analysis in FY2015. The information is being used as a strategic planning guide and tool to facilitate long-term police department decision-making and homeland security investment planning.

The proposed Project would improve safety and security in the region by providing reliable public transportation in the event that New Jersey and New York City job centers need to be evacuated during widespread outages of the commercial grid. No significant adverse impacts related to safety and security were identified for the Build Alternative. During island mode operations, additional personnel (local or NJ TRANSIT police) would be required at intersections for the HBLR and local road crossings to direct traffic. Safety and security features are incorporated into the project design.

This chapter describes the anticipated construction elements and techniques, provides an estimated construction schedule, and assesses the potential for short-term impacts during construction of the Build Alternative. The No Action Alternative would not entail any construction activities and is therefore not discussed in this chapter. The Build Alternative construction techniques described herein are based on current conceptual engineering design and the project team’s past experience on similar projects. The contractor’s means and methods ultimately utilized for the Build Alternative may vary based on the final design and the Design-Build contractor; however, this analysis provides a reasonable worst-case scenario for assessing environmental Design-Build impacts and mitigation measures.

17.1 CONSTRUCTION ELEMENTS AND TECHNIQUES

The construction of the Build Alternative is described in this section. In general, equipment required for construction would include light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines, foundation pile-driving equipment, directional drilling equipment, and power hand tools.

17.1.1 Preferred Alternative Project Component A – Main Facility

As stated in Chapter 2, “Project Alternatives,” HClA has prepared approximately 126 acres of the Koppers Koke Site for development by elevating the site to meet NJ TRANSIT’s Design Flood Elevation (DFE) to comply with New Jersey’s Uniform Construction Code (UCC) and other relevant requirements (Department of Consumer Affairs [DCA] 2013). As a result, no site clearing would be required on the Main Facility site. Based on a review of geotechnical boring data (as described in Chapter 13, “Soils and Geology”), blasting at the Main Facility site would not be required. The general construction steps at the Main Facility would be as follows:

- Procurement of specialized long-lead equipment, such as turbines;
- Mobilization of construction equipment;
- Limited site grading activities to obtain the elevations determined by the overall Project site plan;
- Construction of the Main Facility building foundation—including pile driving to rock, using a double-casing technique to prevent migration of contaminated materials (as discussed later in this chapter), and forming and casting concrete floor slabs and equipment pads;
- Installation of major facility components (turbines, storage tanks, pumps, transformers, generators, boilers, solar panels, and all other related facility equipment)—these components would be delivered to the site by river barge, truck, or rail, and installed on the concrete pads;

- Steel erection and building construction to house the turbines and other equipment;
- Installation of the substation switchgear yard equipment;
- Construction and installation of all the structures and equipment for the SFCs;
- Construction of stormwater detention basin and sitewide stormwater collection and drainage system;
- Construction and installation of all the structures and equipment for the solar facility;
- Underground duct bank construction for the installation of utility cables and feeders;
- Installation of sanitary sewer and water supply connections to municipal services; and
- Construction of the natural gas pipeline to the Main Facility.

NJ TRANSIT would install the sanitary sewer and water supply connections from the Main Facility site to the nearby connection points on the Kearny Peninsula. Standard utility cut and cover methods would be used for this work, except where the utility line would pass through delineated wetlands, in which case the line would be directionally drilled under them to avoid impacts. The utility line installation would be expected to last three to six months.

The entire construction period at the Main Facility (from mobilization to commissioning) is anticipated to be approximately 48 months. The pile driving phase at the Main Facility is estimated to last 12 months. However, as discussed in the sections below, there are no sensitive receptors for noise and vibration near the Main Facility site. A temporary floating access easement would be secured for construction access from the river and sheet pile wall.

17.1.2 Preferred Alternative Project Component B – Natural Gas Pipeline Connection

Construction on the six-acre parcel would include installation of a metering station and other infrastructure to an approved and coordinated design with the natural gas supplier. The gas supply pipeline and associated aboveground installations at the six-acre parcel would be designed and constructed in accordance with the USDOT regulations in 49 CFR Part 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*, and other applicable federal and state regulations. Among other design standards, 49 CFR 192 specifies pipeline material selection; minimum design requirements; protection from internal, external, and atmospheric corrosion; and qualification procedures for welders and operations personnel. Anticipated construction equipment would include light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines, foundation pile driving equipment, directional drilling equipment, and power hand tools. It is expected that work on Preferred Alternative Project Component B would last approximately four to eight months and would be completed during the construction of Preferred Alternative Project Component A.

17.1.3 Preferred Alternative Project Component C – Electrical Lines to Mason Substation

Preferred Alternative Project Component C would include the installation of an electrical line system from the Main Facility to Mason Substation. This DEIS evaluated two methods for installation of electrical lines that extend from the Main Facility to Mason Substation: electrical lines installed on monopoles (up to 220 feet high); and electrical lines installed via underground cables in duct banks. The three design options evaluated were 1) all electrical lines installed overhead on monopoles; 2) all electrical lines installed underground in duct banks; and 3) a combination of using overhead (monopoles) and underground (duct banks) options. The third design option was selected as the preferred design option based on various site-specific factors, such as access, site constraints, localized geology, areas of known contamination and documentation/survey of existing utilities (both overhead and underground). Construction impacts to existing utilities may result in interruptions to public utilities and/or transportation service delays and therefore, the project is being designed to avoid these interruptions.

The monopoles would be installed 150 to 1,200 feet apart. For monopoles with a diameter greater than four feet, at each monopole location four drilled shafts roughly two feet in diameter and up to 95 feet deep would be augered with permanent steel casings. The reinforcing steel cage would then be placed atop the shafts and concrete would be casted using the tremie method. After the concrete cures, the monopole towers (delivered pre-fabricated in sections) would be installed on top of the concrete foundations with an anchor bolt ring previously cast into the shaft. For monopoles with a diameter less than four feet, at each monopole location a single drilled shaft roughly 3.5 to 5 feet in diameter and up to 95 feet deep would be augered with a permanent steel casing. The reinforcing steel cage would then be placed atop the shaft and concrete would be casted using the tremie method. After the concrete cures, the monopole towers (delivered pre-fabricated in sections) would be installed on top of the concrete foundations with an anchor bolt ring previously cast into the shaft. Necessary equipment would include a larger drilled shaft auger with rock socket core barrel capacity, service crane(s), and multiple deliveries of concrete trucks from a nearby concrete batching plant. The stringing of the electrical lines on the cross arms and insulators of the new monopoles would be the final step.

To install electrical lines within new duct banks, the first step would be trenching along the proposed route, to a minimum approximate depth of 36 inches. Materials removed during trenching would be reused on-site where permissible or disposed of offsite at appropriate regulated facility. Multiple conduits would then be installed within the trench using a conduit support system prior to the casting of the concrete. Concrete would then be cast within the trench, and electrical wire would be inserted through the conduits of the duct bank using previously installed pull strings. Necessary equipment would include material delivery vehicles (flat beds), excavating equipment, cranes, and concrete delivery trucks.

Preferred Alternative Project Component C would likely be completed within nine months; the sequencing of all electrical line installations would be concurrent with construction of the Main Facility.

17.1.4 Preferred Alternative Project Component D – Electrical Lines and New Kearny Substation

The electrical line from the Main Facility to the new Kearny Substation would be constructed in the same manner as described above for Preferred Alternative Project Component C. The same design options were evaluated for installation of the electrical lines, and the third design option (i.e., the combination of using monopoles and underground duct banks options) was selected as the preferred design option. The decommissioning of Amtrak's Substation No. 41 would be scheduled after the construction of the new Kearny Substation. Amtrak's Substation No. 41 provides the region with power essential to sustaining reliable and necessary transportation along the Northeast Corridor. To maintain continuous passenger rail services, the new Kearny Substation would be entirely operational before Substation No. 41 can be decommissioned. The cutover in services between the existing and new substations would be closely coordinated with Amtrak to ensure that there were no service disruptions. Construction activities within Cedar Creek Marsh South would be governed by state and federal regulatory permits to minimize adverse impacts to natural resources, as discussed more in the sections below. While the exact construction methods for the new Kearny Substation may be adjusted to comply with such permits, this analysis assumes a likely sequence of construction activities. The major steps required to construct the new Kearny Substation would likely include:

- Procurement of substation equipment;
- Pile driving of concrete piers to support the elevated platform;
- Construction of an elevated platform on the concrete piers to support the new equipment;
- Erection of new structural steel framework;
- Installation of substation housekeeping pads and equipment;
- Cutover of circuits from the existing Substation No. 41 to the new Kearny Substation; and
- Removal of all equipment from existing Substation No. 41, and appropriate disposal of retired components. Some lattice structures at the existing Substation No. 41 would remain for routing of new electrical lines.

Construction equipment that would likely be on-site include light and heavy trucks, material delivery vehicles (flat beds), service crane(s), air compressors, welding machines, foundation pile driving equipment, concrete delivery trucks, and power hand tools. The entire construction period at the new Kearny Substation is anticipated to be approximately 24 months. The existing Amtrak access road would be used to transport materials to the site. Pile driving would occur during a four to six-month period. As discussed in the sections below, there are no sensitive receptors near the new Kearny Substation.

17.1.5 Preferred Alternative Project Component E – Electrical Lines and New NJ TRANSITGRID East Hoboken Substation

This DEIS evaluated three methods for installation of electrical lines (design options are categorized below), that extend from the Main Facility eastward to Henderson Street Substation (except for Hackensack River Crossing and Bergen Tunnels segments): electrical lines installed on monopoles (maximum of 220 feet in Kearny, maximum of 65 feet in Jersey City with an exception at the Hackensack River crossing); electrical lines installed via underground cables in duct banks, and attachment to existing infrastructure (e.g., HBLR elevated tracks and bridges), where possible. The monopole and duct bank construction techniques are discussed above. Attachment to existing infrastructure (e.g., existing HBLR bridge) would include the installation of a galvanized steel Unistrut on an external bridge girder, with typically three conduits attached to it using stainless steel connection hardware. One conduit would house 15kV power cables, one would house fiber optic communications cables, and the other would be installed as a spare for power cables. The three design options evaluated were: 1) all electrical lines installed overhead on monopoles; 2) all electrical lines installed underground in duct banks; and 3) a combination of using overhead (monopoles) and underground (duct banks) options as well as attachment to existing infrastructure. The third design option was selected as the preferred design option based on various site-specific factors, such as access, site constraints, localized geology, areas of known contamination and documentation/survey of existing utilities (both overhead and underground). Construction impacts to existing utilities may result in interruptions to public utilities and/or transportation service delays and therefore, the project is being designed to avoid these interruptions.

The electrical lines extending from the Main Facility to the new NJ TRANSITGRID East Hoboken Substation would entail a combination of new monopoles and new duct banks. From Project Component A to the Hackensack River, installation of monopoles and duct banks would be the same as described in the sections above, with monopoles up to 220 feet tall.

To cross the Hackensack River along the Morris & Essex Line, the electrical line would be installed either: (1) aerially via one new monopole on each bank of the Hackensack River up to 220 feet tall approximately 50 feet north of the existing Lower Hack Bridge; (2) via a submarine cable resting on the Hackensack River bottom; or (3) directionally drilled underneath the Hackensack River sediments. The aerial crossing is the preferred design option. If it is determined that the monopoles by an aerial crossing of the Hackensack River cannot be constructed to support the new electrical line, either the submarine cable or directional drilling methods would be used. This determination will be made in later design phases, by the Design-Build-Commission (DBC) contractor. The submarine cable method, if selected, would entail installation of an approximately 12-inch cable directly below the Lower Hack Bridge. The cable would be routed to the river bottom via directional drilling from the shoreline down to the river bottom to avoid shoreline impacts. Within the Hackensack River, the new 12-inch diameter cable would rest on the river bottom and eventually become covered through the natural siltation process. The directional drilling method would entail drilling at each riverbank to install the cable completely underneath the river bottom. Either of these methods would take up to two months. As stated in the sections below, this work would be scheduled in coordination with the appropriate permitting agencies to avoid adverse impacts to aquatic resources within the Hackensack River, if required.

After crossing the Lower Hack Bridge, the electrical line would proceed along the existing Morris & Essex Line (through monopoles or duct banks or a combination) until the western portal of the existing Bergen Tunnels. The installation process for the monopoles would be the same as that described above, but the monopole heights would be no taller than 65 feet, so the footing would be proportionately smaller and shallower (e.g., 6-foot diameter, with a 70-foot foundation depth). The line would be installed within a new duct bank in the south Bergen Tunnel. This duct bank will be an interior (aboveground) concrete duct bank constructed within the south tube from pre-cast ducts, lowered from the street level at two openings, dollied into place, and grouted together. This construction activity would not be noticeable to riders on the trains. Upon exiting the eastern portal, the electrical line would be installed on a riser to a new monopole, which would cross the Morris & Essex Line on monopoles (up to 65 feet tall) until reaching the new NJ TRANSITGRID East Hoboken Substation.

The construction of the new NJ TRANSITGRID East Hoboken Substation would include the installation of a concrete slab and/or modular unit, switch gear, transformers, and other equipment. Construction at this location is expected to last approximately 2 to 3 months. From the new NJ TRANSITGRID East Hoboken Substation, one electrical line would proceed to the new Henderson Street Substation (the substation is being replaced by NJ TRANSIT under a separate contract to support non-traction power loads for the Hoboken facilities and wayside power). This line would be a combination of new monopoles and duct banks or attached to the existing HBLR infrastructure, as described above. Also, from the new NJ TRANSITGRID East Hoboken Substation, electrical lines would be installed to support HBLR.

17.1.6 Preferred Alternative Project Component F – Connection to HBLR South

Preferred Alternative Project Component F would entail the construction of an elevated platform and two enclosed natural gas-fired emergency generators and storage modules (i.e., the nanogrid) that would be housed on it at the HBLR Headquarters on Caven Point Avenue. The nanogrid would be capable of producing the necessary power for the southern portion of the HBLR. Some measure of stored energy is also anticipated in the form of batteries or flywheels to help smooth out the instantaneous load profile of the HBLR traction loads. These emergency generators and storage modules are expected to be installed on an elevated platform estimated at 7 feet above ground surface to comply with NJ TRANSIT's DFE, discussed below. The elevated platform would be approximately 20,000 square feet and the emergency generators would be 10-14 feet tall, bringing the tallest point of the nanogrid less than 25 feet above nominal ground surface. Existing natural gas connections at the HBLR Headquarters facility would be used to supply the nanogrid engines. A combination of aerial and underground electrical lines on new monopoles less than 40 feet tall (4 feet diameter and 20-foot foundation depth) or duct banks within the NJ TRANSIT-owned property would connect the emergency generators to HBLR.

17.1.7 Preferred Alternative Project Component G – HBLR Connectivity

Preferred Alternative Project Component G includes installation of approximately 14.4 miles of new electrical lines from the new NJ TRANSITGRID East Hoboken Substation to substations along the HBLR to provide power to the entirety of the HBLR. As discussed above for other electrical line installation, this DEIS evaluated three methods for installation of electrical lines along the HBLR: electrical lines installed

on monopoles (up to 39 feet); electrical lines installed via underground cables in duct banks; and attachment to existing infrastructure (e.g., HBLR elevated tracks and bridges), where possible. The three design options evaluated were 1) all electrical lines installed overhead on monopoles; 2) all electrical lines installed underground in duct banks; and 3) a combination of using overhead (monopoles) and underground (duct banks) options as well as attachment to existing infrastructure. The third design option was selected as the preferred design option based on various site-specific factors, such as access, site constraints, localized geology, areas of known contamination and documentation/survey of existing utilities (both overhead and underground). Construction impacts to existing utilities may result in interruptions to public utilities and/or transportation service delays and therefore, the project is being designed to avoid these interruptions.

Construction activities would remain within the existing HBLR right-of-way. The monopoles would be installed 80 to 200 feet apart. Monopoles would be installed via the same process as described above for other Project Components, but the monopole heights would be no taller than 39 feet, so the footing would be proportionally smaller and shallower (e.g., 4-foot diameter, with a 20-foot foundation depth). The monopoles would be installed via drilled shafts with permanent steel casings. The duct banks would entail underground concrete-encased cables at a maximum of five feet below ground surface. The duct banks would be located within the railroad right-of-way and designed to protect the electrical cables from water damage and electrical or physical stress. All underground cables would be insulated for wet or dry conditions and suitable for continuous submersion.

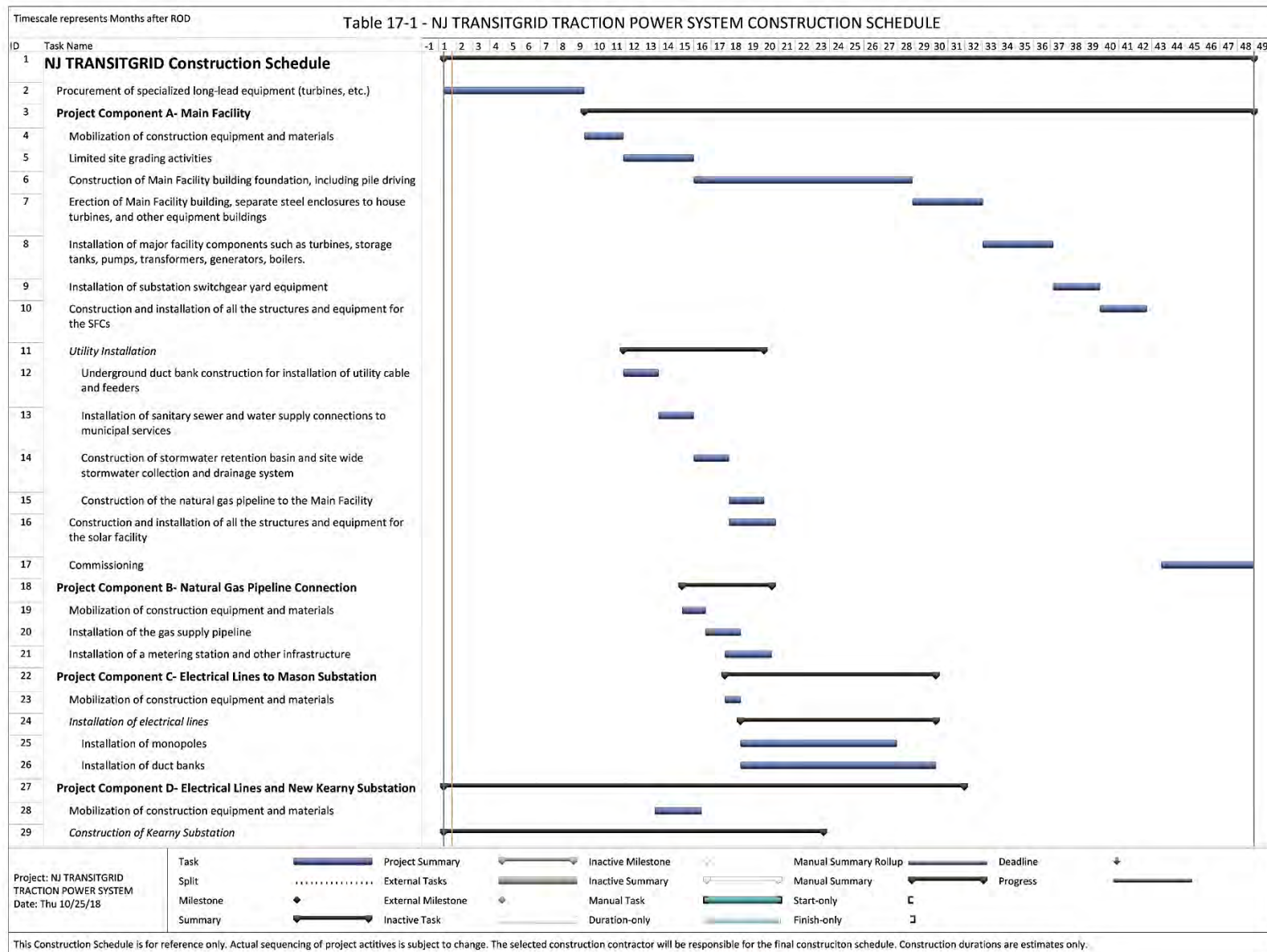
Temporary construction access may be needed. All workers assigned to construction activities along the HBLR will be required to attend NJ TRANSIT's HBLR safety training. Since the construction of Preferred Alternative Project Component G would proceed in a progressive manner, disruptive construction activities would not occur in any one location for an extended period of time (i.e., two weeks). Construction will occur concurrently with the remainder of the proposed Project and support a 2024 commissioning.

Construction equipment would be visible from certain locations. Any diesel emissions generated during construction would be short-term as a result of the temporary operation of construction equipment, which would use Tier 4-compliant engines to reduce emissions. These sources would not be expected to generate significant emissions and would only occur sporadically. Construction activities associated with Preferred Alternative Project Component G would be limited to daytime hours and would temporarily cause elevated noise levels that may be audible to nearby receptors such as residences, schools, or libraries. Once construction activities are completed, noise and vibration levels would return to preconstruction conditions. NJ TRANSIT would adhere to local noise ordinances to the maximum extent practicable. No significant adverse noise impacts would be expected to occur from the construction of Preferred Alternative Project Component G.

17.2 CONSTRUCTION STAGING, SEQUENCING, AND SCHEDULING

The exact contractor work hours would be determined in subsequent project phases; however, since much of the Build Alternative area is industrial, it is expected that two or three daily work shifts may occur

in some locations. Amtrak and NJ TRANSIT own numerous properties and rights-of-way throughout the proposed Project area, which would be used for employee parking and staging areas. It is therefore not anticipated that any private property would be acquired for construction staging, access, or parking. Construction of several major project elements (such as the Main Facility, the new Kearny Substation, the new NJ TRANSITGRID East Hoboken Substation, the nanogrid, and the electrical line installation) would be completed concurrently. Including commissioning, the total construction schedule is expected to be approximately 48 months. See **Table 17-1** for anticipated sequencing of major construction activities.



17.3 ENVIRONMENTAL EFFECTS OF CONSTRUCTION

17.3.1 Land Use

The lengthiest construction activities would occur in industrial areas, including at the Main Facility site (Preferred Alternative Project Component A) and at the new Kearny Substation (Preferred Alternative Project Component D), which are far removed from residential and other sensitive land uses. Construction of the electrical lines and the new NJ TRANSITGRID East Hoboken Substation would take place within existing transportation rights-of-way or easements. Staging areas and construction employee parking areas would be accommodated within existing NJ TRANSIT and Amtrak properties and other transportation rights-of-way. Measures to control noise, dust, and other intrusive activities are described in the sections below. The construction activities would not have any significant adverse impacts on surrounding land uses.

17.3.2 Community Facilities

The Main Facility site and the new Kearny Substation are located in industrial areas. The community facility closest to the Main Facility site is the Hudson County Sheriff's Office at 555 Duncan Avenue in Jersey City, approximately one mile away. The community facility closest to the new Kearny Substation is the Kearny Fire Department Station 4, approximately 1.3 miles away. There are 11 community facilities within the 500-foot study area from the electrical line routes (excluding those that fall within 500 feet of the Bergen Tunnel alignment), including two schools, two fire departments, one hospital, one cemetery and five parks. The electrical line installation work would occur within the existing transportation rights-of-way. The work would be performed in a linear fashion and activities would not be occurring for a sustained period of time in any given location. Where Preferred Alternative Project Component E travels through the Bergen Tunnel, all construction activities would be conducted in the interior of the tunnel (i.e., threading electrical lines through newly installed pre-cast conduits). While some increases in noise levels may be noticeable at certain locations along Preferred Alternative Project Component E—such as near the Hoboken Fire Department Engine Company 1/Ladder Company 2 near Hoboken Yard—these increases would be temporary and of short duration and would not affect routine activities. No community facilities are located within the footprint of Preferred Alternative Project Component G. Those located within the 500-foot study area are described in Chapter 4, "Community Facilities." These include places of worship, daycare facilities, schools, fire departments, health care facilities, cemeteries, and more. The construction activities of Preferred Alternative Project Component G would entail the installation of monopoles and electrical lines within an existing transportation right-of-way and would not adversely affect community facilities located near the existing HBLR. The Build Alternative would not result in significant adverse impacts to community facilities during the construction period.

17.3.3 Visual Quality

Some aspects of the proposed construction activities would be visible to the public. Rail passengers and motorists traveling through Kearny (e.g., along the New Jersey Turnpike and Northeast Corridor) would be able to observe the construction activities. Construction of the electrical line routes, including those

for Preferred Alternative Project Component G along the HBLR, would be visible to workers, residents, and passers-by in those areas. Nevertheless, none of the construction activities or equipment would block sensitive views or significantly adversely affect any viewer groups. All changes in views due to construction activities would be limited and temporary and of short duration. Construction sites would be properly maintained, and in some areas, temporary construction fencing may be constructed for safety and visual purposes. The proposed Project would not result in significant adverse impacts to visual and aesthetic resources during the construction period.

17.3.4 Socioeconomic Conditions

No temporary or permanent business displacements or relocations would be required for construction of the Build Alternative. The construction activities would not affect typical operations of or access to local businesses. Construction of the Build Alternative would generate short-term economic benefits from the creation of temporary construction jobs, the wages paid to construction workers, and the indirect economic activity generated from the direct expenditures in the regional economy. Benefits would accrue to the businesses providing goods and services to construction workers as well as those providing the materials used in construction. The Build Alternative would not result in significant adverse impacts to socioeconomic conditions during the construction period.

17.3.5 Air Quality

Construction-related air quality effects include the potential for increased fugitive dust from on-site equipment activities, transportation of construction materials, and vehicular exhaust emissions from material delivery and hauling trucks, construction equipment, and workers' private vehicles. Dust generated from on-site construction activities would be controlled through the application of water or foam, consistent with the state permit conditions that would apply to such activities. Examples of air quality control measures that would be implemented include:

- Requiring non-road diesel engines to adhere to Tier 4 emission standards;
- Limiting vehicle idling times to less than three minutes on diesel powered engines and posting signage regarding the idling limits;
- Limiting operating speeds of on-site equipment;
- Implementing appropriate dust control measures for stockpiles; and
- Ensuring that haul trucks use designated truck routes designed to minimize impacts on sensitive receptors.

A dust monitoring program, including visual and active monitoring of airborne Particulate Matter 10 micrometers or less (PM₁₀) and dust control measures, would be developed and implemented during construction earthwork activities at the Main Facility site to reduce the potential for off-migration of contaminants and to protect worker health. These measures would ensure that the construction activities would not result in significant adverse impacts to air quality.

17.3.6 GHG Emissions

A temporary increase in GHG emissions would result from the construction of the Build Alternative. GHG emissions generated during construction would be limited and short-term, resulting from: on-site non-road construction engines; on-road trucks and worker trips; and indirect emissions from extracting, producing, and transporting construction materials and fuels. NJ TRANSIT would encourage its contractors to reduce construction-period GHG emissions by maximizing the use of local materials suppliers, evaluating the feasibility of biodiesel for diesel non-road engines, designating efficient transportation routes for deliveries and worker trips, and adhering to the air quality control measures enumerated in the Air Quality section above. No significant adverse impacts to GHG emissions would result from the Build Alternative's construction.

17.3.7 Historic Resources

The potential for the construction of the Build Alternative to directly impact historic architectural and archaeological resources is described in Chapter 9, "Historic Resources," and Appendix C, "Historic Resources." During construction, special precautions would be taken for construction activities that would occur in close proximity to above-ground historic resources. The contractor would be required to prepare a Construction Protection Plan for aboveground historic structures that are located within 90 feet of construction to identify how the resource would be protected. To avoid adverse impacts on archaeological resources, additional work would be performed in consultation with the terms of the Programmatic Agreement (PA); a draft PA is included in this DEIS. During the geotechnical investigation completed in fall 2017, a representative sample of the soil borings were monitored under the oversight of a qualified archaeologist. The results of the soil borings will be reviewed by a qualified geoarchaeologist to determine depths of fill and identify intact buried land surfaces with potential for archaeological resources. The results of these reviews will inform the design process to better understand the archaeological sensitivity of the areas to be affected. The potential for adverse effects to archaeological resources would then be re-evaluated. If the potential for adverse impacts is identified, appropriate mitigation measures would be developed through ongoing consultation with NJHPO, which could include subsurface archaeological testing to identify the presence or absence of archeological features, or archeological monitoring during construction. The construction-period monitoring and mitigation measures outlined in the draft PA would ensure that no significant adverse impacts to archaeological resources occur from the Build Alternative's construction. Due to the NJHPO's finding of an adverse effect on several historic architectural resources, mitigation measures, as described in the draft PA, would be implemented prior to the start of construction.

17.3.8 Traffic and Transportation

VEHICULAR TRAFFIC

During the construction period for the Main Facility (Preferred Alternative Project Component A), the Build Alternative would result in a minor increase in vehicular traffic, including workers traveling to and from the work site during shift changes and deliveries of equipment and materials. This increase in volume

would be temporary, and since the project site is located in an area with superior access to the regional highway and roadway network, impacts to overall transportation would be negligible. Based on current usages of these highways and roadways, they would still be expected to operate well within their capacity. For installation of monopoles and duct banks, off-street parking would be available for construction workers on NJ TRANSIT and Amtrak properties and other transportation rights-of-way. Existing NJ TRANSIT and Amtrak access points would be used to access the construction sites. During construction of some monopoles close to road intersections (especially for Preferred Alternative Project Component G), and during the installation of the electrical lines to the new monopoles, some brief interruptions of road traffic may be required. These will be permitted by and coordinated with the New Jersey Department of Transportation (NJDOT) and Local traffic authorities, and would require appropriate warning signage and possibly flaggers to direct traffic. No significant adverse impacts to traffic would result from the Build Alternative's construction.

COMMUTER AND INTERCITY RAIL

Work along the existing railroad rights-of-way would be closely coordinated with NJ TRANSIT and Amtrak to ensure continued passenger rail operations throughout the duration of construction. Some limited and planned service disruptions may be required to accommodate the construction activities; however, these would be infrequent and managed to minimize disruption to commuters. These would require flaggers to control train movement past the monopole or duct bank installation sites if they were in close proximity to active rails. However, these restrictions would be temporary in nature, and would change locations as the construction progressed. The cutover in power from the existing Substation No. 41 to the new Kearny Substation would be planned to ensure no interruption to traction and non-traction power. As a result, no significant adverse impacts to rail operations would result from the Build Alternative's construction.

AIR TRAFFIC

Due to the proximity of the proposed exhaust stacks and monopoles in Kearny, NJ, to the Newark Liberty International Airport, consultation with the Federal Aviation Administration (FAA) was conducted regarding any potential impact to air traffic from their installation. As discussed in Chapter 10, "Traffic and Transportation," FAA requested that NJ TRANSIT complete FAA's online Notice Criteria Tool prior to commencement of construction. The plans for the proposed stacks and monopoles will be reviewed by FAA's Obstruction Evaluation process. Since the proposed stack heights are 150 feet, and the proposed monopole heights are shorter than other existing infrastructure in the project area, the proposed Project would not create any new obstacles nor have an impact on air traffic. Monopoles will be approved by and registered with FAA prior to construction and will include FAA designated lighting if required.

17.3.9 Noise and Vibration

The Build Alternative has the potential to temporarily increase localized ambient noise levels during construction. Prior to the initial start-up, the steam turbine at the Main Facility would require steam blows to remove debris. Steam blowing is used to remove any debris that may have settled within the steam turbine during manufacturing of the steam turbine. The steam blows would be controlled and occur during the daytime for approximately two to four weeks depending on the number of blows that are

required to meet the cleanliness requirements of the steam turbine vendor. The typical sequence time is five minutes per blow and 30 to 60 minutes between blows to re-fill the drums, heat the water, and re-pressurize the system. The steam blows would be expected to generate a noise level near 115 dBA at three feet from the steam vents. The NJDEP standard for noise at industrial receptors is 75 dBA. Noise from the steam blow would be expected to be reduced to 75 dBA at a distance of approximately 400 feet from the equipment. Because this is a short-term event, this noise level would not significantly impact the nearby business or operations at industrial properties.

The noisiest construction activity would be the pile driving phases at the Main Facility and new Kearny Substation, which would last approximately twelve months. The foundation for the nanogrid (Preferred Alternative Project Component F) may also require pile driving. While noise generated from pile driving would be audible at surrounding properties, no noise-sensitive receptors are located near the Main Facility site or new Kearny Substation. The closest sensitive receptor to the Main Facility is a residential neighborhood in Jersey City which is located 0.7 miles away. Sensitive receptors are located within close proximity to the HBLR Headquarters facility where the nanogrid would be constructed. Nevertheless, the proposed location of the nanogrid at the facility would be more than 600 feet from any sensitive receptor. Pile driving activities are expected to produce noise levels of approximately 100 dBA at 50 feet. At 600 feet from the source, the noise level would be 71 dBA, which is 19 dBA below the OSHA 8-hour exposure limit and meets the NJDEP standards for industrial sources. This is about the sound level of a noisy restaurant. At a distance of 0.7 miles, the noise level would be 54 dBA, which is moderately annoying, but quieter than the level of conversational speech. If pile driving is required at Preferred Alternative Project Component F, it would exceed the residential noise standard of 65 dBA for locations within approximately 1,000 feet (0.2 miles), so construction times would need to be restricted to within the hours of 7:00 am and 7:00 pm on weekdays, 9:00 am and 7:00 pm on Saturdays, and no pile driving activity would be allowed on Sundays.

Additionally, pile driving produces vibrations which can be perceptible to people and animals more than one thousand feet away. However, the energy associated with noise and vibrations declines logarithmically with distance from the source. For heavy pile driving, vibrations are not troublesome to people at distances over 200 feet. The nearest sensitive receptors are more than 3,000 feet away from the construction site at the Main Facility (Preferred Alternative Project Component A) and new Kearny Substation (Preferred Alternative Project Component D). However, since some aquatic life is much more sensitive to vibrations than humans, coordination with USFWS and NMFS will ensure that migration and spawning windows for threatened and endangered species and special species of interest will be avoided, as appropriate. For the nanogrid (Preferred Alternative Project Component F), sensitive receptors (i.e., residences) are approximately 600 feet from the proposed construction site, which may require pile driving for the foundation. The vibrations at this distance would be below the threshold at which they would be perceived as troublesome, and this location is greater than a mile from the Hudson River, so no impacts to aquatic organisms would be anticipated from pile driving activities there.

Construction of monopoles and duct banks to install the electrical lines would entail some noise-generating activities, including excavation and boring with an auger, producing noise that would be audible to nearby residents and workers. This electrical line work would, however, proceed sequentially

along each rail line and construction would not be sustained in any given location for an extended period of time (i.e., up to two weeks in one location). Local noise ordinances comply with NJDEP Noise Control Standards (7 N.J.A.C. § 29), which state that between 7:00 AM to 10:00 PM, repeating noise levels should not exceed 80 dBA and impulsive noise levels should not exceed 50 dBA. More information on municipal noise standards are presented in Chapter 11, “Noise and Vibration.” Based on the typical construction equipment and methods proposed, vibration levels at sensitive receptors in the study area are expected to be well below levels that cause cosmetic and structural damage. Any special pre-construction surveys and/or crack monitoring needed for aboveground historic structures would be identified as part of the Construction Protection Plans discussed in the “Historic Resources” section above. With adherence to these measures, no significant adverse noise or vibration impacts would result from the construction of the Build Alternative.

17.3.10 Natural Resources

As described in Chapter 12, “Natural Resources,” the majority of the project area is unvegetated and contains little to no natural resources. Construction activities would, however, increase the potential for erosion and sedimentation. To avoid impacts to adjacent natural resources—such as Cedar Creek Marsh South and the Hackensack River—NJ TRANSIT would develop and implement a Soil Erosion and Sedimentation Control (SESC) Plan and utilize best management practices (BMPs). BMPs would include the use of silt curtains on land and turbidity booms in-water within the construction area to prevent sediment migration, as well as hay bales around the perimeter of construction in close proximity to wetlands. The proposed Project would be subject to several federal, state, and local permits that are intended to protect natural resources, including wetlands, groundwater, water bodies, forests, threatened/endangered species, and more. Such permits contain extensive conditions pertaining to construction activities, including use of BMPs such as those listed above, as well as water pumps, frac tanks and monitored and maintained filter bags. The respective permit conditions will also guide project staging and construction/site management. The BMP measures that would be in place during construction would eliminate the risk of downstream sedimentation or groundwater contamination. NJ TRANSIT would ensure compliance with all permit conditions.

For Preferred Alternative Project Component D, pile driving activities for the new Kearny Substation and auger drilling for the new monopoles would impact the waterbottom of the Cedar Creek Marsh South, as well as displace any fishes and aquatic organisms therein. However, as described in Chapter 12, “Natural Resources,” since the area of the Cedar Creek Marsh South to be used for Preferred Alternative Project Component D is hydrologically restricted from the Hackensack River, the habitat value is low relative to other more connected portions of the Cedar Creek Marsh to the north. According to the NOAA Essential Fish Habitat (EFH) Mapper (NOAA 2017), the area has no EFH, no Habitat Areas of Particular Concern (HAPC), and no Essential Fish Habitat Area (EFHA) protected from fishing.

During pile driving for the Main Facility building and during monopole installation groundwater would be encountered. Piles would be installed using a double/multi-casing that will prevent spread of existing contaminated groundwater at the Main Facility site. For monopoles, each shaft (as described above) would be drilled with permanent steel casings. Reinforcing steel cages would be placed atop the shafts

and concrete would be casted using the tremie method to avoid contamination to groundwater along the proposed Project corridor. In addition, a Stormwater Management plan in conformance with §7 N.J.A.C. 8 will be developed to include BMPs during construction to prevent any stormwater runoff migration to groundwater. Measures will include silt fences, hay bales, and water pumps to ensure a separation between the construction area and groundwater.

As stated above, if the preferred alternative of an aerial crossing of the Hackensack River is not possible, Project Component E may include installation of a submarine cable across the Hackensack River bottom or a directionally drilled cable. Either activity would require several federal and state permits and close coordination with natural resource protection agencies, including but not limited to USACE, USCG, NMFS, and NJDEP, to minimize potential impacts to natural resources. The water bottom on which the cable will be laid upon the river bed is identified as EFH for summer flounder and Atlantic herring, and migratory habitat for shortnose Atlantic sturgeon, and winter flounder. The cable could impact EFH by displacing a minor amount of water bottom habitat during construction (approximately 2,000 square feet) but will not restrict passage or migratory movement for any species of marine life. Coordination with NMFS would ensure that construction would be completed during specified work windows to minimize impacts to these species, outside of migration and breeding timeframes. Based on a 10/25/18 email correspondence with Karen Greene (Greene Karen, 2018a, Greene Karen, 2018b), Mid-Atlantic Field Offices Supervisor, NOAA-NMFS, "There is no seasonal in-water work limits for summer flounder... we have not had any targeted recommendations for that species in the Hackensack River." Generally, other regional aquatic species that can be given consideration for moratoriums or seasonal restrictions are anadromous fishes from March 1 to June 30 and Winter flounder from January 1 to May 31 (see Appendix D). As required in the NJDEP and USACE's standard permit conditions, project construction will adhere to regulatory guidelines, seasonal restrictions and utilize BMPs to minimize and avoid any adverse impacts to aquatic species or water quality. Project Component E would be scheduled to be compliant with such seasonal work restrictions.

A USACE Section 10/404 and NJDEP WFD permit would be procured to allow the described cable crossing if submarine cable or directional drilling is selected. As conditions of the NJDEP and USACE permit approvals, wetland mitigation is anticipated, and will be completed by purchasing wetland mitigation bank credits from a state and federally approved mitigation bank. Either Kane Mitigation Bank or MRI-3 Mitigation Bank will be utilized. See Chapter 12, "Natural Resources," for additional information on mitigation. Soil erosion and sediment control measures will be in place throughout construction to reduce adverse impacts to the Hackensack River due to the submarine cable installation, including turbidity barrier and silt curtains.

All other construction activities would take place within existing transportation ROW, which is already disturbed, and has little or no natural resource value. With adherence to these measures and remaining within existing ROW corridors, no significant adverse impacts to natural resources would result from the construction of the Build Alternative.

17.3.11 Soils and Geology

For construction of the Main Facility, additional clean source fill material may be required to establish appropriate site topography and drainage, and to back fill specific areas requiring excavation. All fill material that is proposed to be imported and placed on existing soil areas would meet NJDEP's Alternative and Clean Fill Guidance, dated December 2011, as discussed in Chapter 14, "Contaminated Materials." Also discussed in Chapter 14 is a Materials Management Plan that would be prepared to address management of contaminated soils encountered during construction. Work within soil exposed areas would employ required SESC and BMP measures.

Under the Build Alternative, construction activities such as compaction and pile driving would be temporary. These activities do not have the potential to induce earthquakes in the study area. Because of the low magnitude of potential seismic activity, and the distance from the faults, the Main Facility is not expected to be impacted by earthquakes.

17.3.12 Contaminated Materials

As discussed in Chapter 14, "Contaminated Materials," construction of the Build Alternative has the potential to expose historic fill or contaminated soil and/or groundwater at several sites throughout the project corridor. With the implementation of the protocols that would be followed for the handling, storage, transport and disposal of contaminated materials, construction of the Build Alternative would not result in significant adverse impacts related to contaminated materials.

Construction plans and specifications for all project components would provide procedures for stockpiling, testing, loading, transportation, and proper disposal of the excavated materials requiring off-site disposal. A LSRP-approved RAWP Amendment with Materials Management Plan (MMP) would be prepared, as would a Health and Safety Plan (HASP) to minimize exposure of contaminated materials to workers and the public (see Chapter 16, "Safety and Security").

Any material excavated during utility installation, facility foundation construction, installation of foundations for monopoles, and excavation for duct banks would be characterized to classify the material for disposal (e.g., as hazardous or non-hazardous contaminated waste, petroleum-contaminated wastes, historic fill containing construction and demolition debris, or uncontaminated soils). Waste characterization sampling would be completed in accordance with the requirements of the waste disposal facilities, as well as adhere to local, state, and federal regulations. The waste material would be temporarily stored or stockpiled at the site with appropriate soil and sediment control measures and away from the streams and drains to prevent impacts to human health and the environment. Licensed waste haulers or transporters would be used to transport materials to the waste disposal facilities with appropriate permits and in accordance with local, state, and federal regulations. The licensed disposal facility would be selected based on the type of waste (i.e., construction and demolition waste, contaminated soil, or hazardous waste).

Dewatering could be required during excavations for utilities, facility foundation construction, and installation of foundations for monopoles. Dewatering would be conducted in accordance with applicable

local and state requirements. Liquids from the dewatering of any boreholes or excavations would be temporarily stored in frac tanks or pumped directly into a truck for off-site disposal at a regulated facility. If required, dewatering mitigation measures would include settlement or filtration of pumped water to reduce turbidity, discharge control, and other measures to reduce the potential for short-term construction-related impacts.

Minimal soil disposal from the Koppers Koke Site is expected for the 26 acres of Preferred Alternative Project Components A and B. Any Processed Dredge Material (PDM) that is removed during construction activities would be used to grade areas of low elevation at the site. The majority of Preferred Alternative Project Components A and B would be covered with improvements or clean fill cap. Clean fill material that is imported would meet NJDEP's Alternative and Clean Fill Guidance, dated April 2015. There are no buildings to be demolished; however, existing electrical lines, poles or towers and utilities may need to be removed or altered during construction. All construction debris would be surveyed, tested (if necessary), and disposed of at a licensed facility if found to contain any contaminants above the NJDEP levels.

Specific construction methods would be employed to prevent migration of contaminants at Preferred Alternative Project Components A and B. Any subsurface activities on the Main Facility (Preferred Alternative Project Component A) will have a single casing when the meadow matt layer is penetrated for drilling or pile driving through the PDM and fill layers. Double casing will be required when the varved clay layer is penetrated for deeper borings or piles. The outer casing will be advanced with an auger drill bit or pile driving. The auger will also be utilized for the double casing method where the borehole or pile will be advanced deeper into the varved clay layer and then mud rotary or pile driving will be utilized to advance through the stiff varved clay layer for accessing the till layer and bedrock. Any water generated during dewatering activities would be stored in fractionation tanks or pumped directly to trucks for off-site disposal in accordance with local and federal regulations. In areas where the final cap is disturbed, the site restoration would be equally protective. Construction plans and specifications would provide procedures for stockpiling, testing, loading, transportation, and proper disposal of excavated materials requiring off-site disposal. Construction of Preferred Alternative Project Component A would not affect current remediation activities, including the existing Dense Non-Aqueous Phase Liquid Interim Remedial Measure (DNAPL IRM) system for coal tar DNAPL, capillary break for chromite ore processing residue (COPR), and pump and treat system at the Standard Chlorine Chemical Company (SCCC) site.

Electrical lines for Project Components C, D, and E would be installed through new monopoles and underground duct banks below ground surface. Monopoles through industrial Kearny to Cedar Creek Marsh South would be a maximum of 220 feet in height with a foundation consisting of four two-foot concrete piles cast in augered holes. The foundation depth for these foundation piles would be 95 feet below ground surface. Options for crossing the Hackensack River include an aerial crossing approximately 50 feet north of the Lower Hack Bridge (preferred option), a submarine cable laid on the river bottom, and a directionally-drilled cable below the river bottom. Through Jersey City and Hoboken for Preferred Alternative Project Component E along the Morris & Essex right-of-way, monopoles would be 65 feet in height with a 48-inch diameter foundation, with the exception of one monopole (maximum 220 feet) on the east bank of the Hackensack River for aerial crossing of the river. The foundation depth for the 65-foot-tall monopoles would be 50 feet below ground surface. Underground duct banks would be to a

maximum of five feet below ground surface. Material excavated during monopole or duct bank installation would be treated as described above.

It is anticipated groundwater would be encountered during installation of the new monopoles and underground duct banks. Monitoring wells that have been installed at the Koppers Koke Site have measured groundwater ranging from approximately three feet below ground surface to 21 feet below ground surface. These measurements were taken by Beazer, Field & Technical Services, LLC during quarterly monitoring in February 2016. Any water generated during dewatering activities would be treated as described above.

At the HBLR Headquarters, the emergency generators and stored energy that would make up the nanogrid would be installed on an elevated platform estimated at 7 feet above ground surface to comply with NJ TRANSIT's DFE. The proposed platform is anticipated to be approximately 20,000 square feet and the emergency generators would be 10-14 feet tall, bringing the tallest point of the nanogrid less than 25 feet above nominal ground surface. Natural gas connections are already in place at the HBLR Headquarters facility. A combination of aerial and underground electrical lines on new monopoles less than 40 feet tall or duct banks within the NJ TRANSIT-owned property would connect the emergency generators to HBLR.

The platform for the emergency generators would be supported by one of two foundation systems: either a foundation of piles driven to refusal or the excavation of a shallow mat to a maximum depth of five feet below ground surface. Based on the records review and past/current land use, it is anticipated that contaminated materials could be encountered during construction of the platform for the nanogrid. Any excavated materials would be treated as described above. If needed, dewatering at the site would also be conducted as described above.

For Preferred Alternative Project Component G, the NJ TRANSIT HBLR was issued a Conditional No Further Action (NFA) letter by NJDEP for the HBLR Linear Construction Project (LCP) on May 3, 2012. Construction plans would provide procedures for stockpiling, testing, loading, transportation, and proper disposal of the excavated materials requiring off-site disposal. An MMP would be prepared as would a Health and Safety Plan (HASP) to minimize worker and public exposure to historic fill materials. Material excavated during the installation of monopoles for Preferred Alternative Project Component G would be treated as described above.

17.3.13 Utilities

Aside from the utility extensions to the Main Facility site (discussed above) and the natural gas pipeline connections at Preferred Alternative Project Components A and B, utilities in the project area would not be affected during construction. All necessary agreements for the water supply and sanitary sewer connections would be executed with the appropriate entities to define the responsibility for and coordination of the construction and operation of these utilities to minimize impacts to existing utilities when new connections for the Main Facility are made. Construction impacts to existing utilities may result in interruptions to public utilities and/or transportation service delays and therefore, the project is being designed to avoid these interruptions. Therefore, construction of the Build Alternative would not result in significant adverse impacts to utilities.

17.3.14 Safety and Security

Construction of the Build Alternative would require operation of heavy construction equipment near operating railroads, and safety risks are inherent in this type of work. However, construction-related hazards would be effectively minimized through compliance with all applicable federal and state occupational safety and health standards to ensure the safest practices are being enforced. Adherence to these standards, and applicable National Electrical Safety Code regulations and utility design and safety standards, would protect construction workers and the public from unacceptable risks. As there are many aspects of construction that will be performed on or near active rail lines, all contractors would be instructed to attend mandatory Roadway Worker safety training as required and furnished by the rail line operators, including NJ TRANSIT, Amtrak, HBLR and utility operators such as PSE&G.

During construction, a construction HASP based on industry standards for accident prevention would be implemented by NJ TRANSIT's contractors. Contractors would be required by contract to comply with the construction health and safety program, which would include site security measures. Key elements of the HASP would include:

- Responsibilities of construction team and subcontractors;
- Job site rules and regulations;
- Emergency response procedures;
- Amtrak, NJ TRANSIT, and HBLR requirements for work within rights-of-way (railroad safety training, flag protection, etc.);
- Safety inspections and audits;
- Medical services and first aid;
- Safety meetings, employee training, and communications, including a hazard communications program and a review of procedures when performing high risk tasks;
- Personal protective equipment;
- Standard construction procedures; and
- Accident investigation and reporting.

Construction would occur primarily in locations that are not accessible to the general public. The HASP would identify how the Main Facility site and other project component sites would be secured—such as fencing and locked gates at access points. The HASP would address on-site contamination and would be prepared in accordance with OSHA regulations for Hazardous Waste Operations and Emergency Response (HAZWOPER) (29 CFR § 1910.120 [2013]), OSHA construction safety requirements (29 CFR § 1926 [2013]), and other applicable regulations and guidelines. The HASP would describe in detail the site-specific health and safety procedures to minimize exposure of contaminated materials to workers and the public. The HASP would include specifications for training of appropriate personnel, monitoring for the presence of contamination (e.g., buried tanks, drums or other containers), sludges or soils that show evidence of

potential contamination (such as discoloration, staining, or odors), and approved response plans. Appropriate PPE would be provided to workers during subsurface activities. As indicated above, a dust monitoring program would be established in appropriate locations to protect worker health.

Additionally, for Preferred Alternative Project Component G, because the HBLR has many at-grade roadway crossings that are accessible to the general public, special consideration will be required for construction activities in these areas. Signage, temporary fencing, and additional instruction to construction workers will be needed to maintain the safety of both construction workers and the public. These procedures will be included in the HASP as well.

18.1 INTRODUCTION

This section assesses the potential for the Build Alternative to result in indirect and cumulative effects. Potential indirect effects are generally defined as those induced or “caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable” (40 CFR § 1508.8(b) [2012]). Potential cumulative effects may result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions (40 CFR § 1508.7[2012]).

18.2 INDIRECT EFFECTS

The proposed Project will not result in an increase in train frequency, capacity or rail ridership. It will not induce development or result in indirect effects related to population or employment increases since none are expected to occur. The assessments for Land Use (Chapter 3) and Socioeconomic Conditions (Chapter 5) included consideration of the proposed Project’s potential to cause direct and indirect effects and concluded that the proposed Project will not have an adverse impact on the population, land use, or socioeconomic activities in the study area.

The project will result in indirect air emissions (including greenhouse gas emissions [GHGs]), which were not accounted for in Chapter 7, “Greenhouse Gas Emissions.” Air emissions result from the manufacturing of equipment and materials used in a project’s construction. Indirect air emissions are also known as embodied or lifecycle emissions. At this time, there is no consistent or standardized method for calculating the lifecycle emissions for transportation projects. There are no tools currently available for clearly and meaningfully discerning which emissions are attributable to a specific project and which emissions would have occurred without the project. However, it is important to note that these short-term emissions occur only during the manufacturing of specific equipment and materials. Vendors that produce equipment and materials are subject to regulation at their facilities.

The presence of temporary workers during the construction phase will likely cause a short-term demand for services in the area, including increased demand at restaurants and gas stations. However, the construction phase is temporary and will not contribute to permanent growth-related effects, such as demand for municipal services in the area. Following the construction period, there will be approximately 30 permanent employees at the Main Facility (Preferred Alternative Project Component A). These permanent jobs would not be expected to result in any substantive residential construction or construction-related emissions, or create indirect effects related to demand on municipal services.

As a common occurrence of construction-related activities, noise and vibration will present a temporary displacement of terrestrial, avian or aquatic species that may frequently or infrequently traverse the Project area. However, the fragmented nature and limited wildlife function and value provided by these

resources, established active rail corridors and current active construction in the Project area present the same indirect effects on species, whether temporary or long term.

18.3 CUMULATIVE EFFECTS

The cumulative effects of the proposed Project with past and present actions have been assessed and described in each resource Chapter, as appropriate. Past and present actions include:

- The industrial development of the Kearny Peninsula and surrounding areas, including high voltage electrical towers and several power plants: the 452MW PSE&G Fossil Kearny Generating Station, the 620MW PSE&G Fossil Hudson Generating Station, and the 81MW PSE&G Fossil Essex Generating Station. In addition, the Kearny Landfill was converted into a Solar Facility (3MW) by PSE&G as part of a movement toward the production of clean energy.
- The industrial use of the properties within the Redevelopment Area, which resulted in soil and groundwater contamination and the current designation of the area as a brownfield site. (The Main Facility will be located on blocks and lots that are on NJDEP's Known Contaminated Sites List [KCSL] and the nearby Standard Chlorine Chemical Company [SCCC] site is a USEPA Superfund site).
- The preparation of the Koppers Koke Site for development by HCIA, including Processed Dredge Material (PDM) operation that has capped and elevated the site to meet all relevant floodplain criteria.
- The development of railroad infrastructure, including substations, tracks and yards associated with the Northeast Corridor and the Morris & Essex Line, some of which lies within the Meadowlands District boundaries.

Reasonably foreseeable future actions that will occur within the two-mile study area include:

- Improvements to substations (Mason, Henderson Street, and Building 9) on the Northeast Corridor and Morris & Essex Line, as identified in the No Action Alternative.
- Development within the Redevelopment Area, including the warehouse development on the Koppers Koke Site and additional adjacent development.
- Construction of the Wittpenn Bridge Replacement, which is underway and being completed in phases. The entire project is expected to be complete in 2022 (NJDOT 2016).
- Elements of Amtrak's Gateway Program, a series of rail infrastructure improvements designed to improve rail service, enhance capacity, and allow four mainline Northeast Corridor tracks between Newark, New Jersey, and Penn Station, New York. Phase 1 is currently underway and includes the Portal North Bridge Project and the Hudson Tunnel Project. Reasonably foreseeable components in the study area include construction of Portal Bridge North over the Hackensack

River and the Sawtooth Bridges Replacement Project in Kearny. (The Gateway Program Development Corporation 2018).

- New Jersey has adopted a renewable portfolio standard that will require nearly one-fourth of net electricity sales to come from renewable energy resources by 2021. Specific solar and offshore wind requirements are included in the standard.
- The redevelopment of the former Van Leer Chocolate Factory site into the Enclave Jersey City, a multi-use residential and commercial complex including apartment units, retail space and a parking garage.

Additional development that either would not occur within the two-mile study area or occur only partially within those boundaries but would nevertheless have synergistic effects with the proposed Project include the other projects in NJ TRANSIT's Resilience Program, Amtrak's Hudson River Tunnels resiliency project, and the Rebuild by Design administered by the U.S. Department of Housing and Urban Development (HUD) efforts planned for the Meadowlands.

As part of its Resilience Program, NJ TRANSIT is proceeding with the implementation of the DISTRIBUTED GENERATION SOLUTIONS project to provide power to rail and bus stations and other NJ TRANSIT infrastructure in northeastern New Jersey independent of the services supported by the NJ TRANSIT TRACTION POWER SYSTEM project (i.e., proposed Project). There are currently seven individual DISTRIBUTED GENERATION SOLUTIONS projects in the planning and design stages. The DISTRIBUTED GENERATION SOLUTIONS projects will focus on supplying reliable power to certain train stations, bus garages and other transportation infrastructure. These projects have independent utility from the proposed Project as well as from each other as the purpose of these projects is to provide reliable power solutions that would run entirely on their own during a commercial grid outage. Power equipment would be installed at each individual facility and would be capable of supplying power (to that facility only) when the commercial grid is down, allowing for continued operations during a power outage or otherwise as needed to support efficient operations. The installed power equipment at each individual facility would be maintained and operated by the staff familiar with that specific facility.

Five of these projects received FTA and NJ HPO approval through Categorical Exclusion and Section 106 reviews, respectively, under NEPA in spring and summer 2018. NEPA documentation, for the remaining two project sites is currently in progress, based on 20% design for the individual project.

The proposed Project in combination with above described initiatives would enhance railroad service reliability by reducing flooding potential and/or restoring service quickly after a major storm.

18.3.1 Land Use, Visual Quality, Noise and Vibration

Preferred Alternative Project Components A and B of the Project, together with the other planned development in the Redevelopment Area, would restore vacant and remediated brownfield property to active use and actualize many of the goals and objectives of the NJSEA plan. As described in Chapter 2, "Project Alternatives," the project will leave the existing pad at Substation No. 41 in place (Preferred

Alternative Project Component D). Amtrak will continue to own the parcel and may use the fill pad for ancillary railroad purposes. The proposed Project is not expected to create significant adverse land use impacts, visual quality, noise or vibration on an individual or cumulative basis. The installation of additional electrical lines, new substations, and other project components would not have any cumulative effects beyond those discussed in Chapter 3, “Land Use, Zoning and Public Policy” Chapter 8, “Visual Quality,” and Chapter 11, “Noise and Vibration.”

18.3.2 Air Quality and GHG Emissions

The air quality modeling accounted for current ambient air conditions; therefore, the impacts of past contributors to pollutant concentrations in the area have been considered. On an individual or cumulative basis, neither the proposed Project nor the other energy-related initiatives in the area would violate the National Ambient Air Quality Standards (NAAQS). Air pollution concentrations, which have been decreasing over the past couple of decades in response to increasingly strict environmental rules, would be expected to continue to decrease as progress is made on meeting the goals of the State’s Energy Master Plan, as more coal-fired plants convert to using natural gas as the primary fuel, and as more electric generation capacity is converted to renewable energy sources, such as solar and wind. The proposed Project will result in additional GHG emissions, which combined with increasing global emissions, would result in climate change and associated effects. However, the increase in GHG emissions from the proposed Project in comparison to those in New Jersey, the United States and the world, are negligible. In 2015, New Jersey GHG emissions for electrical generation were 17.7 million metric tons of carbon dioxide equivalents (MMTCO₂e) (of a total of 100.9 MMTCO₂e). The NJ TRANSITGRID emissions of 0.577 MMTCO₂e/year would be 3.3% of GHG emissions from power production in New Jersey. This would also be 0.00953% of the total GHG emissions of the United States in 2014, and 0.00141% of the world GHG emissions in 2014 (World Resources Institute, 2019).

18.3.3 Natural Resources

Past, present and reasonably foreseeable future actions have affected or will affect natural resources in the study area. The proposed Project is partially located within the New Jersey Meadowlands District, an approximate 8,400-acre mixed use and tidal and freshwater wetland preservation area, and the Main Facility site (Preferred Alternative Project Component A) is directly adjacent to the Hackensack River.

Wetlands

HCIA’s planned access improvements to the Koppers Koke Site will cause a permanent loss of what are already fragmented low functioning wetlands, which are dominated by invasive common reed within the Redevelopment Area. These resources have been devalued by the remedial activities initiated in 2008 which resulted in the placement of PDM throughout the site.

Prior to the start of remedial activities, the Koppers Koke Site had a total of approximately 17 acres of mapped regulated wetlands. The HCIA completed a re-delineation of the onsite wetlands which reduced the quantity of regulated wetlands from approximately 17 acres to approximately 3.27 acres, and HCIA obtained a revised permit from the USACE for the re-delineated wetlands. In response to the USACE

permit conditions, two wetland credits for every acre impacted were purchased by HCIA for the land-based wetlands areas from a wetland mitigation bank (Marsh Resources, LLC) and these credits were accepted by the USACE, Interagency Review Team (IRT) and the NJDEP as a suitable compensatory wetland mitigation alternative and compliance with permit conditions. Onsite wetlands were filled as part of the remedial activities. Remedial activities in the Hackensack River in the westerly portion of the Koppers Koke Site also impacted intertidal wetlands. USACE and NJDEP permit requirements for the impacts required the construction of a wetlands mitigation area and this area was constructed by Beazer East, Inc., along the northern perimeter of the property where the site had tidal interchange with the Hackensack River (HCIA 2013).

SCCC had a total of 1.68 acres of on-site wetlands prior to remedial construction. This total included 0.34 acres of isolated wetlands, 1.32 acres of freshwater emergent wetlands and 0.03 acres of *Spartina* wetlands. Diamond Shamrock had a total of 0.51 acres of onsite wetlands prior to remedial construction. This total included 0.48 acres of isolated wetlands and 0.03 acres of *Spartina* wetlands. The disturbance of a total of 1.65 acres of wetlands was required for implementation of remediation on SCCC and Diamond Shamrock. In accordance with federal and state policies, a joint wetlands mitigation restoration plan was submitted to the USEPA to restore 1.65 acres of wetlands and it included the 0.45 acres of intertidal wetlands (0.18 acres on the Diamond Shamrock site and 0.27 acres on the SCCC Site) along the Hackensack River shoreline and 1.20 acres of freshwater emergent wetlands on the SCCC Site in upland areas. Due to unexpected site conditions, the plan was modified during construction and approved by USEPA and NJDEP. The final mitigation activities included 1.41 acres of mudflat restoration, establishment of 1.28 acres of freshwater wetlands on the SCCC property and the purchase of 0.225 acres of off-site wetland mitigation bank credits (HCIA 2013).

The proposed Project is anticipated to impact 1.7 acres of wetlands for the construction of the new Kearny Substation and 0.3 acres for the installation of the monopole within Cedar Creek Marsh South (Preferred Alternative Project Component D), as well as 3.27 acres for the construction of Preferred Alternative Project Component A, and 0.26 acres of for the construction of Preferred Alternative Project Component B. Preferred Alternative Project Component E will require 0.18 acres of impacts to the Hackensack River channel bed should the cable lay down method be utilized. The wetlands in the study area are considered low-resource value because:

- The vegetation is and was predominately invasive vegetation common to altered urbanized, fragmented areas that provide limited access for wildlife or consequential benefits for foraging, breeding or shelter;
- The resources in question are not systematically contiguous nor are they tidally connected to the Hackensack River. They no longer represent or provide the historic benefits and functions of the larger tidally-influenced Meadowlands Habitat Complex; and
- The fragmented nature of the wetlands and their limited foraging resources, combined with the presence of active rail lines which create noise and disturbance to wildlife, reduce the likelihood that terrestrial or avian species frequent these locations.

Any temporary wetland impacts due to construction staging, and any permanent wetland disturbances, would be mitigated through the purchase of wetland mitigation bank credits, prior to start of construction. Mitigation credit purchase will provide a “no net loss” through the purchase of wetland credits released for sale based on the restoration and establishment of wetland functions and native wetland vegetation. Although up to 2 acres of low value isolated wetlands will be eliminated by the Build Alternative, through mitigation, the project will support the restoration of up to 5 acres of high value, functional wetlands. The loss of low value wetlands will be mitigated through mitigation credit purchase of high-resource value wetlands from a restored federally and state approved mitigation bank(s). Thus, there will be no cumulative impact to wetlands from the proposed Project.

Water Quality

Significant cumulative adverse effects on the water quality of the Hackensack River are not anticipated. Construction of the Wittpenn Bridge, Portal Bridge North, and development in the Redevelopment Area would implement landward and in-water soil erosion sediment control (SESC) measures and BMPs to minimize the potential for runoff and increased sedimentation in the Hackensack River.

No unique geologic, soil, or mineral resources would be affected by the proposed Project. Thus, on an individual or cumulative basis, the proposed Project would not significantly affect soil or geologic resources.

18.3.4 Traffic and Public Transportation

The cumulative effects on traffic and public transportation were evaluated in Chapter 10, “Traffic and Transportation.” Warehouse development within the Redevelopment Area could increase traffic on study area roadways. Traffic associated with the Main Facility site would be easily accommodated into the traffic network with little noticeable effect.

The cumulative effects of the proposed Project, together with the other transportation resiliency projects in the study area, including the DISTRIBUTED GENERATION SOLUTIONS project, would improve the reliability of public transportation in the core service territory during commercial grid power outages.

18.4 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The proposed Project would not have indirect adverse effects on population, land use, or socioeconomic conditions in the study area. The construction phase of the project is not anticipated to result in any long-term growth. In addition, while noise and vibration are expected to increase during construction, this would be temporary, and is not expected to permanently displace mobile natural resources.

There are potential beneficial cumulative effects associated with the proposed Project. In conjunction with state and federal initiatives, the proposed Project will enhance railroad reliability by reducing flooding potential and/or restoring rail service quickly after a major storm. In addition, public transportation would be improved as both the cumulative effects of the proposed Project and neighboring transportation resiliency initiatives materialize.

The installation of new substations, electrical lines, and other project components would not have any cumulative effects beyond those discussed in Chapters 3 (“Land Use, Zoning and Public Policy”), 8 (“Visual Quality”) and 11 (“Noise and Vibration”). Air quality and GHG emissions would not present adverse cumulative effects. There is the potential to have cumulative effects on wetlands; however, these are not considered significant adverse impacts. Furthermore, no significant cumulative adverse impacts are anticipated to Hackensack River water quality, and no unique soil, geologic or mineral resources would be affected.

19.1 INTRODUCTION

This chapter considers whether minority populations and/or low-income populations would experience disproportionately adverse impacts from the proposed Project. It also discusses the public outreach efforts undertaken to inform and involve minority and low-income populations within the study area.

19.2 METHODOLOGY

In accordance with Federal Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), this environmental justice analysis identifies and addresses any disproportionate and adverse impacts on minority and low-income populations that lie within the study area for the proposed Project. Executive Order 12898 also requires federal agencies to work to ensure greater public participation in the decision-making process.

This environmental justice analysis was prepared to comply with the guidance and methodologies set forth in the DOT's Final Environmental Justice Order (DOT 2012), FTA's environmental justice guidance (FTA 2012), and the federal Council on Environmental Quality's (CEQ) environmental justice guidance (CEQ 1997).

Consistent with those documents, this analysis involved the following basic steps:

1. Select a geographic analysis area based on where the proposed Project components may cause impacts;
2. Obtain and analyze relevant race, ethnicity, income and poverty data in the study area to determine where minority and low-income communities, if any, are located;
3. Identify the potential of the Build Alternative to adversely impact minority and low-income populations;
4. Evaluate the potential of the Build Alternative to adversely affect minority and low-income populations relative to the effects on non-minority and non-low-income populations to determine whether the Build Alternative would result in any disproportionately high and adverse effects on minority or low-income populations;
5. Implement a public engagement strategy to encourage environmental justice populations to participate in the environmental review process; and
6. Should the Build Alternative result in disproportionately high and adverse effects on minority or low-income populations, determine whether further mitigation measures or alternatives that would avoid or reduce the disproportionately high and adverse effects are not practicable. Further, ensure that a substantial need for the action exists, and other alternatives that satisfy

the need would have less adverse impacts on the protected population but would either have other adverse impacts that are more severe or involve increased costs of extraordinary magnitude.

The study area for environmental justice encompasses the area most likely to be affected by the Build Alternative and considers the area where potential impacts resulting from construction and operation of the Build Alternative would occur. The study areas for environmental justice follows the two-mile study area (centered on the stacks at the Main Facility, Preferred Alternative Project Component A) for assessing potential air quality impacts and the 500-foot buffer area along Project Components B, C, D, E, F, and G used for the analyses of land use, socioeconomic conditions, and other analyses.

The 80 census tracts considered in the analysis are shown on Figure 5-1 in Chapter 5, “Socioeconomic Conditions.” In addition, as described in Chapter 5, “Socioeconomic Conditions,” since the Main Facility could have impacts that are more localized, this analysis considers more specific block group data within the Town of Kearny census tract 127, where the Main Facility would be located.

19.3 AFFECTED ENVIRONMENT

The environmental justice analysis in both study areas for Project Components A through G is discussed below.

19.3.1 Identification of Environmental Justice Populations

Data on race and ethnicity were gathered from the U.S. Census Bureau’s 2016 American Community Survey (ACS) data within the study areas, and then aggregated for each municipality. Data on poverty status were gathered from 2012- 2016 ACS 5-Year Estimates. For comparison purposes, data for Hudson, Essex and Bergen Counties were also compiled as well as the State of New Jersey. Based on census data on racial and ethnic characteristics and poverty status and the guidance documents described above, potential environmental justice areas were identified as follows:

Minority communities

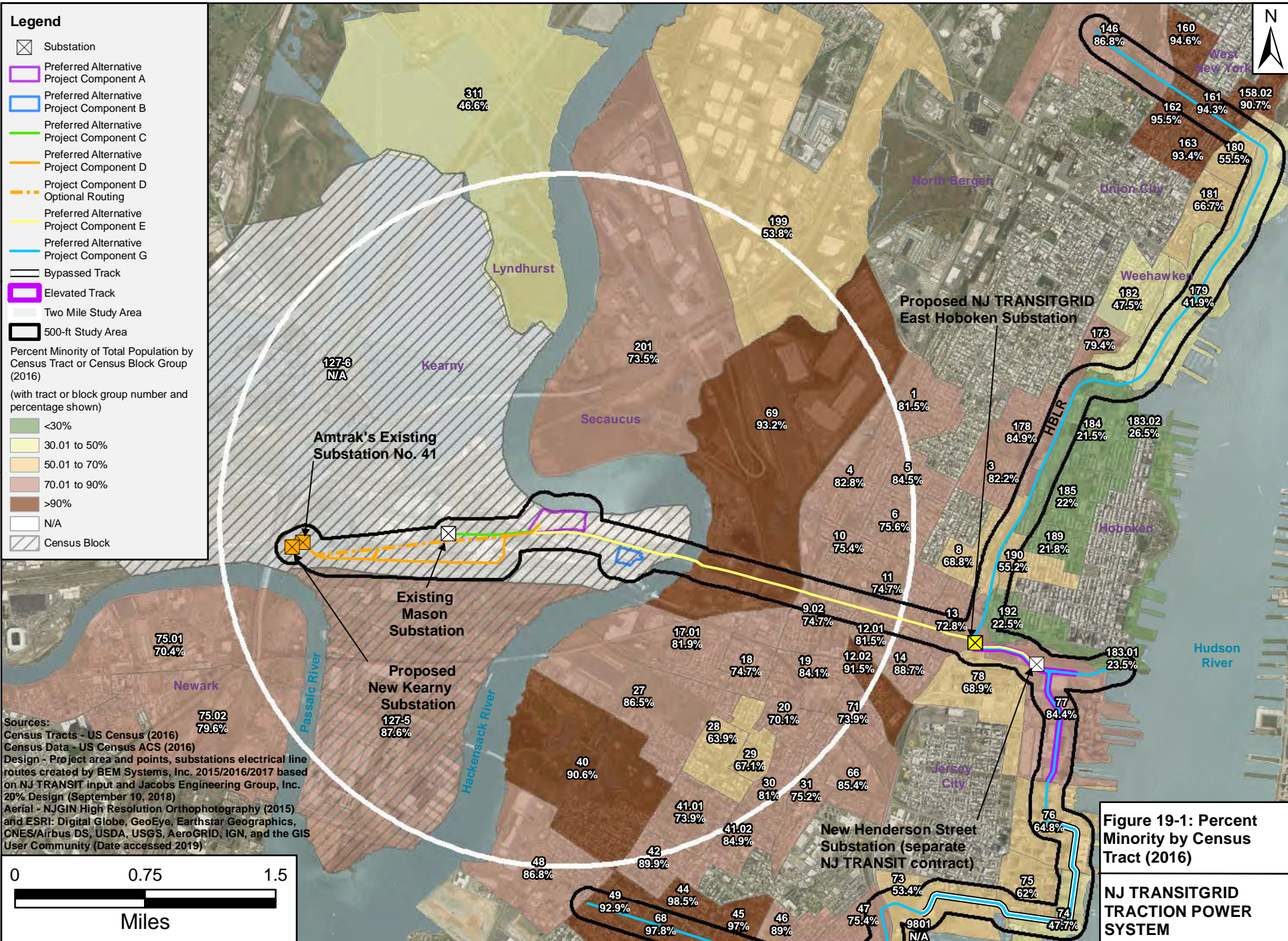
FTA’s Environmental Justice Circular 4703.1 defines minorities to include American Indians or Alaskan Natives, Asian, African Americans or Black persons, Hispanic or Latino persons, and Native Hawaiians or other Pacific Islanders. The environmental justice analysis also considers minority populations to include persons who identified themselves as being either “some other race” or “two or more races” in the 2010 Census. The DOT does not identify a threshold for determining whether an area’s population is considered minority. CEQ guidance defines minorities the same way and indicates that minority populations should be identified where either: (1) the minority population of the affected area exceeds 50 percent; or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. For this analysis, the CEQ’s threshold of 50 percent was used. In Hudson County, approximately 70.6 percent of the population is minority, Essex County contains approximately 68.5 percent minority, and Bergen County’s population is approximately 41.3 percent minority.

Low-income communities

Low-income is defined by FTA to be people whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines, which is updated annually and is based on household size. FTA also encourages the use of local poverty threshold or a percentage of median income for the area, provided that the threshold is at least as inclusive as the HHS poverty guidelines. Because HHS data is not available below the state level, this analysis uses the information on individuals in households below the poverty level as defined by the U.S. Census Bureau. The percent of individuals living below the poverty level in each census tract, as estimated in the 2012- 2016 ACS 5-Year Estimates, was used to identify low-income populations. Because CEQ guidance does not specify a threshold for identifying low-income communities, all census tracts with a low-income population percentage that is greater than in the state of New Jersey was considered a low-income community. Approximately 10.9 percent of the total population of New Jersey is living below the federal poverty level. This is a conservative approach since Hudson, Essex, and Bergen Counties have 17.4 percent, 17.2 percent, and 7.5 percent living below the poverty level, respectively.

19.3.2 Environmental Justice Populations in the Study Areas

Table 19-1 shows race, ethnicity, and poverty level for the census tracts in the study areas as well as census block group data within the Town of Kearny for census tract 127. Shading in the table denotes the presence of environmental justice populations. The percent minority population and percent of population below the poverty level are presented by geographic area in Figures 19-1 through 19-4.



Legend

- ⊠ Substation
- ▭ Preferred Alternative Project Component A
- ▭ Preferred Alternative Project Component B
- ▭ Preferred Alternative Project Component C
- ▭ Preferred Alternative Project Component D
- ▭ Project Component D Optional Routing
- ▭ Preferred Alternative Project Component E
- ▭ Preferred Alternative Project Component G
- ▭ Bypassed Track
- ▭ Elevated Track
- Two Mile Study Area
- ▭ 500-ft Study Area

Percent Minority of Total Population by Census Tract or Census Block Group (2016)
(with tract or block group number and percentage shown)

- ▭ <30%
- ▭ 30.01 to 50%
- ▭ 50.01 to 70%
- ▭ 70.01 to 90%
- ▭ >90%
- ▭ N/A
- ▭ Census Block

Sources:
 Census Tracts - US Census (2016)
 Census Data - US Census ACS (2016)
 Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
 Aerial - NJGIN High Resolution Orthophotography (2015) and ESRI: Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Date accessed 2019)

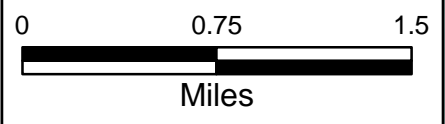











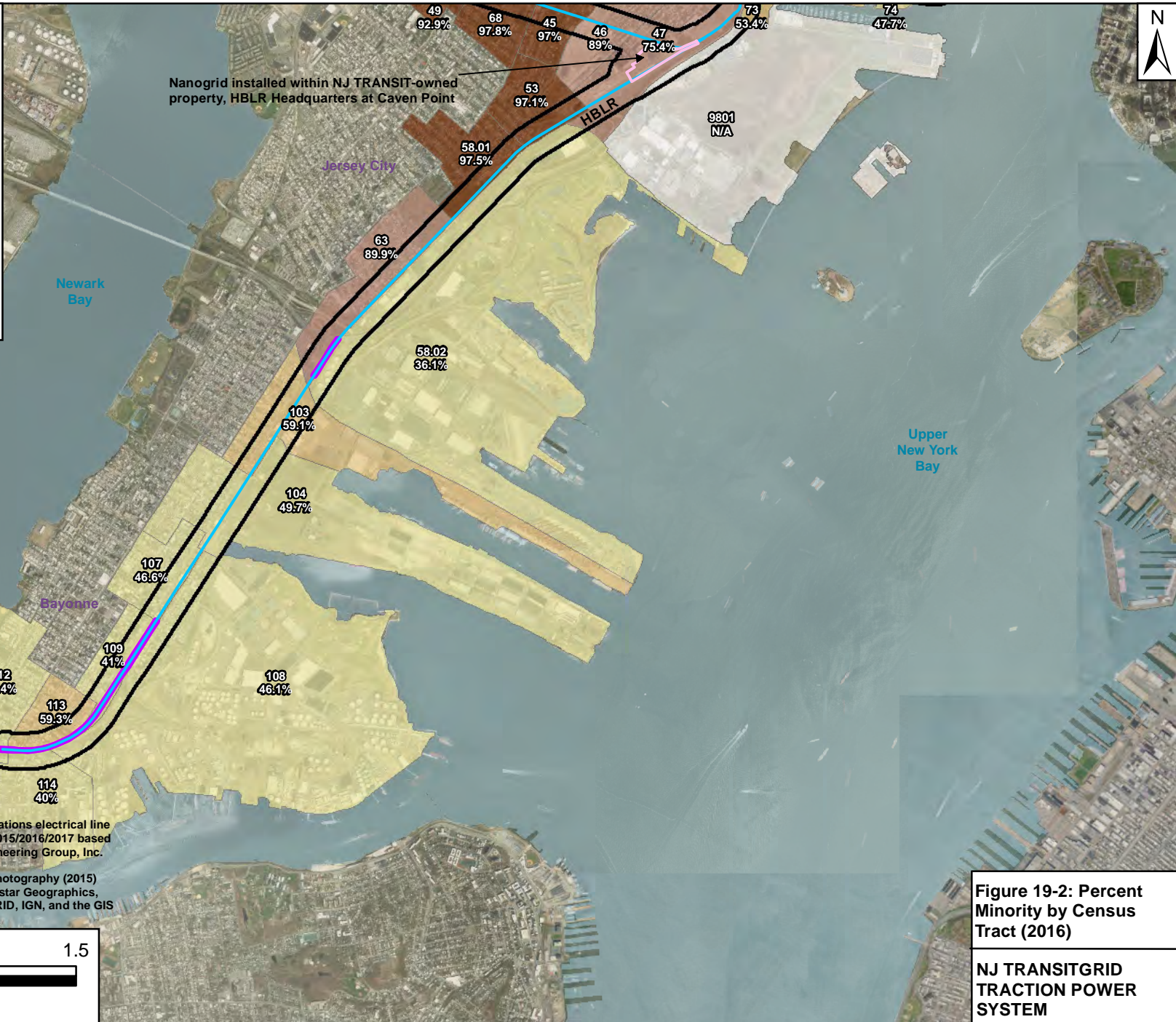
Figure 19-1: Percent Minority by Census Tract (2016)
NJ TRANSITGRID TRACTION POWER SYSTEM

Legend

-  Preferred Alternative Project Component F
-  Preferred Alternative Project Component G
-  Elevated Track
-  500-ft Study Area

Percent Minority of Total Population by Census Tract or Census Block Group (2016)
(with tract or block group number and percentage shown)

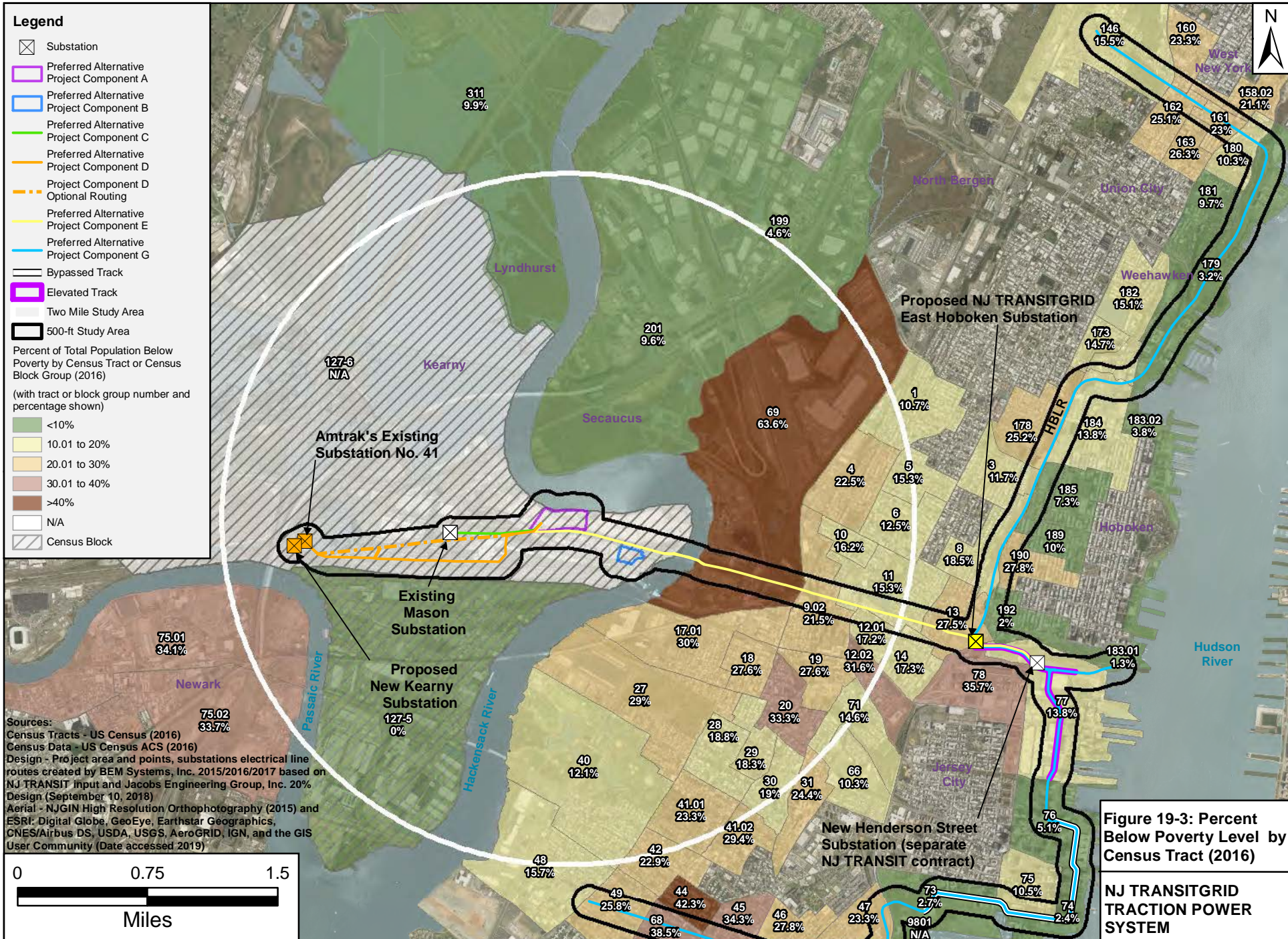
-  30.01 to 50%
-  50.01 to 70%
-  70.01 to 90%
-  >90%
-  N/A

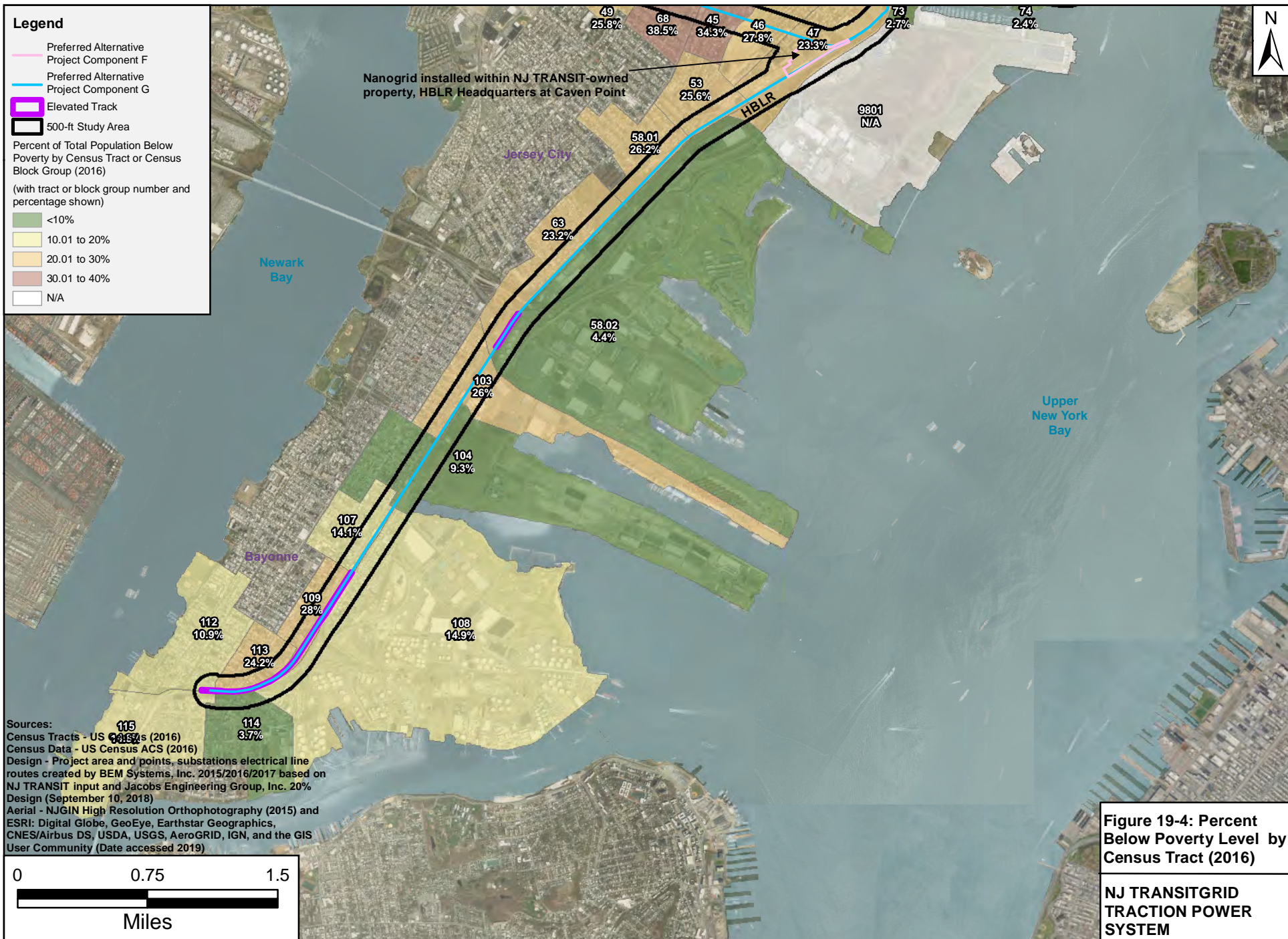


Sources:
 Census Tracts - US Census (2016)
 Census Data - US Census ACS (2016)
 Design - Project area and points, substations electrical line routes created by GEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
 Aerial - NJGIN High Resolution Orthophotography (2015) and ESRI: Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Date accessed 2019)

Figure 19-2: Percent Minority by Census Tract (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM





Legend

- Preferred Alternative Project Component F
- Preferred Alternative Project Component G
- Elevated Track
- 500-ft Study Area

Percent of Total Population Below Poverty by Census Tract or Census Block Group (2016)
(with tract or block group number and percentage shown)

- <10%
- 10.01 to 20%
- 20.01 to 30%
- 30.01 to 40%
- N/A

Sources:
 Census Tracts - US Census ACS (2016)
 Census Data - US Census ACS (2016)
 Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
 Aerial - NJGIN High Resolution Orthophotography (2015) and ESRI: Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Date accessed 2019)

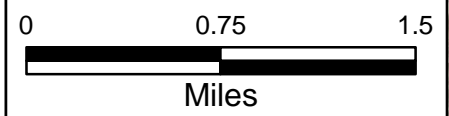


Figure 19-4: Percent Below Poverty Level by Census Tract (2016)
NJ TRANSITGRID TRACTION POWER SYSTEM

Table 19-1 Population and Economic Characteristics

Geographic Area	Race and Ethnicity ¹⁸																			Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority		
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%		
<i>Town of Kearny Census Block Group and Total¹⁹</i>																				
Census Tract 127, Block Group 5	832	103	12.4	340	40.9	0	0	0	0	0	0	0	0	0	0	0	389	46.8	87.6	0
Census Tract 127, Block Group 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town of Kearny	42,029	17,959	42.7	1,414	3.4	92	0.2	1,897	4.5	0	0	666	1.6	655	1.6	19,346	46.0	57.3	11.6	
<i>Jersey City Census Tracts and Total</i>																				
Census Tract 1	6,581	1,219	18.5	46	0.7	0	0	1,679	25.5	0	0	0	0	192	2.9	3,445	52.4	81.5	10.7	

¹⁸ The race and ethnicity categories provided are further defined as: White (White alone, not Hispanic or Latino); Black (Black or African American alone, not Hispanic or Latino); Asian (Asian alone, not Hispanic or Latino); American Indian and Alaska Native alone, not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone, not Hispanic or Latino; some other race alone, not Hispanic or Latino; two or more races, not Hispanic or Latino; Hispanic (Hispanic or Latino; Persons of Hispanic origin may be of any race).

¹⁹ There are no residences within the study areas in Kearny. The population associated with census tract 127, block group 5 reflects the Hudson County Correctional Facility near the southern tip of the Kearny peninsula. For a conservative analysis, this population is considered to be a potential environmental justice community.

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
<i>Jersey City Census Tracts and Total</i>																			
Census Tract 3	4,539	809	17.8	221	4.9	0	7	710	15.6	0	0	24	0.5	0	0	2,775	61.1	82.2	11.7
Census Tract 4	3,760	647	17.2	202	5.4	101	2.7	1,457	38.8	0	0	0	0	128	3.4	1,225	32.6	82.8	22.5
Census Tract 5	4,758	738	15.5	558	11.7	0	0	1,004	21.1	0	0	45	1	106	2.2	2,307	48.5	84.5	15.3
Census Tract 6	5,762	1,405	24.4	373	6.5	30	0.5	1,014	17.6	0	0	72	1.3	43	0.8	2,825	49	75.6	12.5
Census Tract 8	4,108	1,282	31.2	174	4.2	0	0	559	13.6	0	0	0	0	28	0.7	2,065	50.3	68.8	18.5
Census Tract 9.02	6,273	1,590	25.4	233	3.7	0		3,226	51.4	0	0	0	0	30	0.5	1,194	19	74.7	21.5
Census Tract 10	2,056	505	24.6	21	1	9	0.4	806	39.2	0	0	74	3.6	36	1.8	605	29.4	75.4	16.2
Census Tract 11	5,299	1,343	25.3	260	4.9	0	0	1,104	20.8	0	0	10	0.2	64	1.2	2,518	47.5	74.7	15.3
Census Tract 12.01	2,221	410	18.5	86	3.9	15	0.7	1,132	51	0	0	18	0.8	43	1.9	517	23.3	81.5	17.2
Census Tract 12.02	1,636	139	8.5	244	14.9	0	0	562	34.4	0	0	0	0	123	7.5	568	34.7	91.5	31.6
Census Tract 13	2,924	796	27.2	221	7.6	0	0	557	19.1	0	0	24	0.8	53	1.8	1,273	43.5	72.8	27.5
Census Tract 14	3,902	440	11.3	445	11.4	17	0.4	1,142	29.3	21	0.54	12	0.3	83	2.1	1,742	44.6	88.7	17.3
Census Tract 17.01	4,652	843	18.1	803	17.7	0	0	1,431	30.8	0	80	15	0.3	160	3.4	1,400	30.11	81.9	30
Census Tract 18	4,310	1,090	25.3	187	4.3	0	0	1,855	43	0	0	6	0.1	63	1.5	1,109	25.7	74.7	27.6

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
<i>Jersey City Census Tracts and Total</i>																			
Census Tract 19	1,299	207	15.9	133	10.2	11	0.9	873	67.2	0	0	0	8	30	2.3	45	3.5	84.1	27.6
Census Tract 20	3,956	1,182	29.9	318	8	15	0.4	1,615	40.8	0	0	81	2.1	30	0.8	715	18.1	70.1	33.3
Census Tract 27	5,632	760	13.55	1,610	28.6	35	0.6	1,638	29.1	0	0	0	0	46	0.8	1,543	27.4	86.5	29
Census Tract 28	6,175	2,231	36.1	1,351	21.9	0		809	13.1	26	0.4	0	0	76	1.2	1,682	27.2	63.9	18.8
Census Tract 29	4,297	1,415	32.9	535	12.5	6	0.1	1,301	30.3	0	0	0	0	13	0.3	1,027	23.9	67.1	18.3
Census Tract 30	2,900	550	19	475	16.4	9	0.3	0	0	0	0	0	0	56	1.9	1,084	37.4	81	19
Census Tract 31	4,463	1,108	24.8	631	14.1	0	0	0	0	0	0	15	0.3	56	1.3	1,352	30.3	75.2	24.4
Census Tract 40	5,485	513	9.4	1,168	21.3	0	0	2,062	37.6	1,253	22.8	346	6.3	143	2.61	0	0	90.6	12.1
Census Tract 40.01	6,525	1,706	26.2	1,716	26.3	0	0	959	14.7	1,876	28.8	0		268	4.11	0	0	73.9	23.3
Census Tract 41.02	3423	517	15.1	1556	45.5	0	0	143	4.2	1150	33.6	0	0	0	0	57	1.7	84.9	29.4
Census Tract 42	5049	509	10.1	2141	42.4	0	0	503	10	1,819	36	0	0	0	0	77	1.53	89.9	22.9
Census Tract 44	2,502	37	1.5	1,911	76.4	0	0	76	3	0	0	17	0.7	0	0	461	18.4	98.5	42.3
Census Tract 45	4,476	134	3	3,386	75.7	34	0.8	51	1.1	871	19.5	0	0	0	0	0	0	97.0	34.3
Census Tract 46	2,233	246	11.02	810	36.3	8	0.4	10	0.5	1,145	51.3	7	0.3	7	0.31	0	0	89.0	27.8
Census Tract 47	2,649	651	24.6	718	27.1	0	0	207	7.8	0	0	0	0	12	0	1,061	40.1	75.4	23.3

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
<i>Jersey City Census Tracts and Total</i>																			
Census Tract 48	4,257	560	13.2	923	21.7	77	1.8	1,838	43.2	0	0	79	1.9	55	1.3	725	17	86.8	15.7
Census Tract 49	3,885	247	6.4	1,782	45.9	0	0	706	8.3	0	0	35	0.9	0	0	1,088	28	92.9	25.8
Census Tract 53	2,887	85	2.9	1,877	65	0	0	20	0.7	0	0	11	0	0	0	894	31	97.1	25.6
Census Tract 58.01	5,543	139	2.5	3983	71.9	0	0	46	0.8	0	0	0	0	66	1.19	1,309	23.6	97.5	26.2
Census Tract 58.02	1,627	1040	63.9	63	3.9	0	0	252	0.2	0	0	20	1.2	14	0.86	238	14.6	36.1	4.4
Census Tract 63	4,098	415	10.1	1499	36.6	31	0.9	347	8.4	0	0	91	2.2	24	0.58	1,691	41.3	89.9	23.2
Census Tract 66	1,636	239	14.6	38	2.3	0	0	1,293	79	0	0	7	0.4	24	1.5	35	2.1	85.4	10.3
Census Tract 68	3,722	83	2.2	3,021	81.2	0	0	140	3.8	0	0	0	0	104	2.8	374	10	97.8	38.5
Census Tract 69	44	3	6.8	13	29.5	0	0	4	9.1	0	0	0	0	4	9.1	20	45.5	93.2	63.6
Census Tract 71	3,349	874	26.1	335	10	0	0	1,096	32.7	8	0.2	0	0	167	5	869	25.9	73.9	14.6
Census Tract 73	2,010	937	46.6	80	4	15	0.7	707	35.2	0	0	0	0	79	3.9	192	9.6	53.4	2.7
Census Tract 74	5375	2812	53	133	2.5	0	0	1692	31.6	0	0	0	0	215	4	523	9.73	47.7	2.4
Census Tract 75	5812	2208	38	340	5.8	0	0	2138	36.8	42	0.7	22	0.4	92	1.6	970	16.7	62.0	10.5
Census Tract 76	6928	2438	35.1	165	2.6	0	0	3512	50.7	0	0	0	0	313	4.5	500	7.2	64.8	5.1
Census Tract 77	10,202	1,590	15.6	545	5.3	0	0	6,780	66.5	0	0	121	1.2	311	3	855	8.4	84.4	2.4

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
Jersey City Census Tracts and Total																			
Census Tract 78	1,461	455	31.1	170	11.6	0	0	245	16.8	6	0.4	0	0	28	1.9	557	38.1	68.9	35.7
Census Tract 9801	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jersey City	261,666	56,101	21.4	59,253	22.6	516	0.2	65,180	24.9	103	0	1,657	0.6	5,377	2.1	73,479	28.1	78.6	19.4
Hoboken Census Tract and Total																			
Census Tract 183.01	2,375	1,816	76.5	0	0	0	0	330	13.9	0	0	0	0	54	2.8	175	7.4	23.5	1.3
Census Tract 183.02	3,726	2,737	73.5	41	1.1	0	0	554	14.9	0	0	0	0	103	2.8	291	7.8	26.5	3.8
Census Tract 184	5,483	4,306	78.5	26	0.5	0	0	138	2.5	0	0	18	0.3	123	2.2	872	15.9	21.5	13.8
Census Tract 185	6,465	5,042	78	95	1.5	0	0	475	7.4	0	0	0	0	32	0.5	821	12.7	22	7.3
Census Tract 189	3,829	2,995	78.2	9	0.2	0	0	267	7	0	0	0	0	99	2.6	459	12	21.8	10
Census Tract 190	4,924	2,207	44.8	379	7.7	0	0	238	4.8	0	0	0	0	40	0.8	2,060	41.8	55.2	27.8
Census Tract 192	4,159	3,224	77.5	17	0.4	0	0	649	15.6	0	0	0	0	92	2.2	177	4.3	22.5	2
Hoboken	53,136	38,355	72.2	918	1.7	6	0	4,607	8.7	12	0	35	0.1	1,058	2.0	8,145	15.3	27.8	10.5
Township of Lyndhurst Census Tract and Total																			
Census Tract 311	5,684	3,036	53.4	86	1.5	0	0	781	13.7	0	0	53	0.9	48	0.8	1,680	29.6	46.6	9.9

Geographic Area	Race and Ethnicity ¹⁸																			Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority		
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%		
Township of Lyndhurst Census Tract and Total																				
Township of Lyndhurst	21,582	15,020	69.6	212	1.0	19	0.1	1,581	7.3	0	0	104	0.5	179	0.8	4,467	20.7	30.4	9.9	
City of Newark Census Tract and Total²⁰																				
Census Tract 75.01	4,341	1,287	29.6	561	12.9	25	0.4	0	0	0	0	264	6.1	120	2.8	2,084	48.0	70.4	34.1	
Census Tract 75.02	2,741	559	20.4	542	19.8	0	0	13	0.5	0	0	83	3.0	149	5.4	1,395	50.9	79.6	33.7	
City of Newark	280,139	29,949	10.7	135,566	48.4	852	0.1	4,790	1.7	153	0.1	5,066	1.8	2,813	1.0	100,950	36.0	89.3	29.1	
Township of Weehawken Census Tract and Total																				
Census Tract 179	2,379	1,383	58.1	59	2.5	0	0	683	28.7	0	0	0	0	35	1.5	219	9.2	41.9	3.2	
Census Tract 180	4,182	1,863	44.6	152	3.6	0	0	282	6.7	0	0	0	0	45	1.2	1,840	44	55.5	10.3	
Census Tract 181	2,971	989	33.3	105	3.5	0	0	214	7.2	0	0	0	0	8	0.3	1,655	55.7	66.7	9.7	
Census Tract 182	4,139	2,173	52.5	141	3.4	0	0	309	7.5	0	0	0	0	68	1.6	1,448	35	47.5	15.1	

²⁰ While these Newark census tracts reflect the presence of environmental justice populations, there are no residences within the limits of the two-mile study area in Newark.

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
Township of Weehawken Census Tract and Total																			
Township of Weehawken	13,671	6,408	46.9	457	3.3	0	0	1,488	10.9	0	0	0	0	156	1.1	5,162	37.8	53.1	10.3
Town of West New York Census Tract and Total																			
Census Tract 158.02	6,320	586	9.3	49	0.8	0	0	250	3.9	0	0	0	0	52	0.8	5,383	85.2	90.7	21.1
Census Tract 160	3,292	177	5.4	23	0.7	0	0	95	2.9	0	0	18	0.6	0	0	2,979	90.5	94.6	23.3
Town of West New York	52,407	6,516	12.4	1,076	2.1	40	0	3,138	6.0	29	0.1	431	0.8	305	0.6	40,872	78.0	87.6	21.9
Township of North Bergen Census Tract and Total																			
Census Tract 146	3,754	497	13.2	114	3	0	0	272	7.3	0	0	41	1.1	13	0.4	2,817	75	86.8	15.5
Township of North Bergen	62,791	9,758	15.5	1,594	2.5	68	0.1	3,870	6.2	0	0	263	0.4	328	0.5	46,910	74.7	84.5	14.8
City of Bayonne Census Tract and Total																			
Census Tract 103	3,171	1,297	40.9	646	20.4	0	0	205	6.5	0	0	11	0.35	226	7.1	786	24.8	59.1	26
Census Tract 104	4,490	2,260	50.3	466	10	0	0	738	16.4	0	0	0	0	34	0.8	992	22.1	49.7	9.3
Census Tract 107	3,839	2,051	53.4	299	7.8	0	0	161	4.2	0	0	0	0	101	2.6	1,227	0	46.6	14.1
Census Tract 108	3,146	1,695	53.9	174	5.5	0	0	72	2.3	168	5.3	0	0	97	3.1	940	29.9	46.1	14.9

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
<i>City of Bayonne Census Tract and Total</i>																			
Census Tract 109	2,149	1,268	59	138	6.4	0	0	170	7.9	0	0	11	0.5	16	0.7	546	25.4	41	28
Census Tract 112	6,689	4,389	65.6	438	6.6	0	0	232	3.5	0	0	153	2.3	145	2.2	1,332	19.9	34.4	10.9
Census Tract 113	2,755	1,121	40.7	376	13.7	0	0	156	5.7	0	0	0	0	39	1.4	1,063	38.6	59.3	24.2
Census Tract 114	3,794	2,277	60	100	2.6	0	0	551	14.5	0	0	0	0	106	2.8	760	20	40	3.7
Census Tract 115	3,484	1,937	55.6	259	7.4	0	0	266	7.6	0	0	113	3.2	0	0	909	26.1	44.4	14.8
City of Bayonne	65,772	34,488	52.4	6,086	9.3	33	0.1	6,360	9.7	200	0.3	309	0.5	1,207	1.8	17,089	26.0	47.6	15.5
<i>Town of Union City Census Tract and Total</i>																			
Census Tract 161	3,599	205	5.7	70	1.9	0	0	92	2.6	0	0	0	0	0	0	3,232	89.8	94.3	23
Census Tract 162	4,567	207	4.5	36	0.8	0	0	118	2.6	0	0	0	0	42	0.9	4,164	91.2	95.5	25.1
Census Tract 163	4,899	321	6.6	120	2.5	0	0	145	3	0	0	7	0.1	9	0.2	4,297	87.1	93.4	26.3
Census Tract 173	2,578	530	20.6	21	0.8	0	0	222	8.6	0	0	9	0	78	3	1,718	66.6	79.4	14.7
Census Tract 178	6,310	953	15.1	0	0	0	0	510	8.1	0	0	0	0	65	1	4,782	75.8	84.9	25.2
Union City	68,965	8,030	11.6	1,297	1.9	0	0	2,597	3.8	29	0	175	0.3	410	0.6	56,427	81.8	88.4	24.3

Geographic Area	Race and Ethnicity ¹⁸																		Individuals Below Poverty Level
	2016 Total	White		Black/ African American		American Indian/ Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Other		Two or More Races		Hispanic		Total Minority	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	
<i>Town of Secaucus Census Tract and Total</i>																			
Census Tract 199	4,856	2,243	46.2	40	0.8	0	0	1,503	31.0	0	0	0	0	54	1.1	1,016	20.9	53.8	4.6
Census Tract 201	1,860	492	26.5	194	10.4	0	0	855	46.0	0	0	0	0	17	0.9	302	16.2	73.5	9.6
Town of Secaucus	18,737	8,735	46.6	491	2.6	15	0.1	5,067	27.0	0	0	96	0.5	506	2.7	3,827	20.4	53.4	7.8
<i>Regional and State Comparison</i>																			
Hudson County	668,526	193,874	29.0	73,268	11.0	881	0.1	98,226	14.7	373	0.1	3,830	13.6	10,257	3.0	287,817	42.8	70.6	17.4
Essex County	792,586	249,787	31.5	308,463	38.9	1,155	0.1	39,264	5.0	214	0	7,208	0.9	12,081	1.5	174,414	22.0	68.5	17.2
Bergen County	930,310	546,048	58.7	49,047	5.3	1,065	0.1	146,592	15.8	248	0	2,022	0.2	14,087	1.5	171,201	18.4	41.3	7.5
State of New Jersey	8,915,456	5,054,611	56.7	1,133,918	12.7	9,509	0.1	813,826	9.1	2,158	0	37,978	0.4	143,625	1.6	1,719,831	19.3	43.3	10.9

Notes: Shading denotes environmental justice areas.
 Percentages may not add up to 100 due to rounding.
Sources: U.S. Census Bureau, 2016 Census.

The census block groups adjacent to the Main Facility are located in the Town of Kearny. Although there are no residences in these census block groups, the population associated with census tract 127, block group 5 reflects the Hudson County Correctional Facility near the southern tip of the Kearny peninsula. For a conservative analysis, this population is considered to be an environmental justice community. According to census methodology, institutionalized populations, such as those associated with a correctional facility, are not part of the population for whom poverty status is determined.

Environmental justice populations are present in the Jersey City census tracts within the study area. All but two census tracts (census tracts 58.02 and 74) in the Jersey City section of the study area have a minority population that exceeds the 50 percent threshold, ranging from 36.1 percent to 98.5 percent. All but eight census tracts (census tracts 1, 58.02, 66, 73, 74, 75, 76 and 77) in Jersey City exceed the poverty rate for New Jersey, ranging from a rate of 2.4 to 42.3. Altogether, 45 out of the 46 census tracts with available data in Jersey City are considered to be environmental justice populations.

The census tracts in Hoboken have the lowest average percentage of minority populations compared to the other census tracts in the study area (approximately 28 percent). In addition, the census tracts within Hoboken have one of the lowest average poverty rates in the study area (approximately 9 percent). Two of the seven census tracts (census tracts 184 and 190) within the study area in Hoboken are considered to be environmental justice populations. Both census tracts exceed the poverty rate for New Jersey, while one (census tract 190) also exceeds the minority threshold.

The census tract in Lyndhurst is not considered to be an environmental justice population. This census tract has the second lowest average percentage of minority populations in the study area (approximately 47 percent) and the poverty rate does not exceed that of New Jersey.

The census tracts within the study area in Newark, West New York, North Bergen, Union City and Secaucus are all considered to be environmental justice populations. Both census tracts in the Newark portion of the study area have a minority population that exceeds the 50 percent threshold (approximately 70 and 80 percent). These census tracts have the highest average poverty rate in the study area (approximately 34 percent).

The two census tracts in West New York have the highest average percentage of minority populations in the study area (approximately 93 percent). Poverty rates for these census tracts also exceed that of New Jersey.

The census tract in North Bergen exceeds the minority threshold (approximately 87 percent) and exceeds the poverty rate threshold.

All five census tracts in Union City are considered to be environmental justice populations. The census tracts in Union City have the second highest average percentage of minority populations in the study area (approximately 90 percent). The census tracts in Union City also have the second highest average poverty rates compared to the other municipalities in the study area (approximately 23 percent).

The two census tracts in Secaucus exceed the minority threshold (approximately 54 and 74 percent) and are therefore considered to be environmental justice populations. However, the census tracts within Secaucus have the lowest average poverty rates in the study area (approximately 7 percent).

Two census tracts (census tracts 180 and 181) within the study area in Weehawken exceed the minority threshold and one census tract (census tract 182) exceeds the low-income threshold. Therefore, three of the four census tracts are considered to be environmental justice populations.

Six out of the nine census tracts within the study area in Bayonne are considered to be environmental justice communities. Two census tracts (census tracts 103 and 113) have a minority population that exceeds the 50 percent threshold (approximately 59 percent), while six census tracts exceed the poverty rate for New Jersey, ranging from a rate of 14.1 to 28.

Overall, of the 80 census tracts and 2 census block groups that fall within the study areas, 68 are considered to be environmental justice communities.

19.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

19.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed, and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. Under the No Action Alternative, other planned transportation improvements would take place by 2021. These include projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA plans for warehousing development on portions of the Koppers Koke property.

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41. Two existing lattice towers in Cedar Creek Marsh South will be replaced with monopoles. Amtrak is currently proceeding with reconstruction of certain elements of Substation No. 42, located east of the project area at the entrance to the North River Tunnels in Weehawken, NJ, including the installation of a new Control House. In addition, under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel (Project Component A) on the Koppers Koke property as well as the six-acre parcel (Project Component B) located south of the Morris & Essex Line (due to a property settlement, as described in Chapter 2, "Project Alternatives"). Approximately two acres of wetlands (Cedar Creek Marsh South) would be impacted with construction of the new Kearny Substation to replace the existing Substation No. 41.

No substantial changes in the minority and low-income populations in the study areas would be expected under the No Action Alternative.

19.4.2 Build Alternative

As defined in FTA's guidance, based on DOT's Final Environmental Justice Order a disproportionately high and adverse effect on an environmental justice population is an adverse effect that is predominantly borne by a minority and/or low-income population, or would be appreciably greater for the minority and/or low-income population than for the non-minority and/or non-low-income population. Effects that

may occur as a result of a proposed action may be considered in the context of associated mitigation measures and offsetting benefits when determining whether disproportionately high and adverse effects would occur. The effects of the Build Alternative on each resource are discussed below, in the context of the potential effects on minority and low-income populations are discussed below.

LAND USE

Construction of the electrical lines and the new NJ TRANSITGRID East Hoboken Substation would take place within existing transportation rights-of-way or easements. Staging areas and construction employee parking areas would be accommodated within existing NJ TRANSIT and Amtrak properties and other transportation rights-of-way. The proposed Project would not require the acquisition of any residential properties or businesses. However, as discussed in Chapter 3, “Land Use,” the proposed Project will have an adverse effect on the land use and zoning for the approximately two acres of Cedar Creek Marsh South for construction of the new Kearny Substation. While no mitigation is required for land use or zoning, as discussed in Chapter 12, “Natural Resources,” wetland mitigation would be provided. Although this taking would result in a change in land use, it would not have an adverse effect on the local population, since this area is inaccessible to the public and the local population does not directly depend on these natural resources. As a result, the Build Alternative would not result in disproportionately high and adverse land use or zoning effects on minority or low-income populations.

COMMUNITY FACILITIES

There are no community facilities, parklands, or publicly accessible open space resources within the construction footprint of Preferred Alternative Project Components A through G. The Main Facility (Preferred Alternative Project Component A), natural gas pipeline connection (Preferred Alternative Project Component B), electrical lines to Mason Substation (Preferred Alternative Project Component C), and the electrical lines and the new Kearny Substation (Project Component D) would be located entirely within industrial areas. Community facility uses beyond the 500-foot study area, but within the two-mile study area are not considered in this chapter. Laurel Hill Park is the closest community facility to the Main Facility, approximately one mile away in Secaucus. The community facility closest to the new Kearny Substation is the Hudson County Correctional Center, approximately 1.3 miles away. The natural gas pipeline connection and the electrical lines associated with Project Components C and D would also not have the potential to affect any community facilities, based on the nature of these project components and the distances from resources. Therefore, Project Components A through D would not affect community facilities.

Community facilities, parklands, and publicly accessible open space resources within 500 feet of Preferred Alternative Project Components E through G are listed below and described in Chapter 4, “Community Facilities.”

Community Facilities

- Hoboken Fire Department Engine Company 1/ Ladder Company 2
- Grove Church Cemetery
- Hudson County Community College

- Union City Day Care Program, Inc.
- North Hudson Regional Fire and Rescue
- North Hudson Regional Fire and Rescue Ladder 3
- North Hudson Regional Fire and Rescue Squad 1
- The Learning Experience
- Smart Start Academy
- Viaquenti Academy
- River School Newport
- Bright Horizons at Plaza 3 – Waterfront
- Learning Ladders
- Waterfront Montessori
- Early Learning Academy
- Jersey City Medical Center
- Liberty Science Center
- Metropolitan Family Health Network
- Learning Tree
- Advanced Services International Daycare Center
- Bay View -New York Bay Cemetery
- Bayonne Medical Center
- Lincoln Community School #5
- Nicholas Oresko #14
- Beacon Christian Academy
- Bayonne Head Start Program
- Saint Peters Cemetery

Parkland and Open Space

- Old Glory Park
- Louisa Park
- Hamilton Park
- Weehawken Waterfront Park and Recreation Center
- Weehawken Pier and Lincoln Harbor Park
- 19th Street Basketball Courts
- Sixteen Hundred Park
- Louisa Park
- Washington Park
- Mama Johnson Park
- Newport Green Park
- J. Owen Grundy Park
- Township of Weehawken Veterans Park
- Liberty State Park

- Korean War Veterans Park
- Berry Lane Park
- Bayside Park
- Russell Golding Park
- Sister Mariam Theresa Park
- Sigmund Mackiewicz Park
- 11th Street Oval Park
- Edward F. Clark Park
- Southwest Resiliency Park
- Arthur Ashe Basketball Court
- Riverview-Fisk Park
- Virginia Avenue Park
- 28th Street Park

Where Preferred Alternative Project Component E passes through a residential area, all construction activities would be conducted in the interior of the Bergen Tunnel (i.e., threading electrical lines through newly installed pre-cast conduits) and would not affect nearby resources including the Jersey City Medical Center, Jersey City Fire Department Engine 7 Ladder 3, or Reservoir No. 3. The substation that would be constructed as part of Preferred Alternative Project Component E would be within 500 feet of the Hoboken Fire Department Engine Company 1/Ladder Company 2, but would not have the potential to affect the use and operation of that community facility. The nanogrid that would be constructed as part of Preferred Alternative Project Component F would be within 500 feet of the parking lot that serves Liberty State Park, but would not have the potential to affect the use and enjoyment of the park. The electrical lines and poles associated with Preferred Alternative Project Components F and G would be within 500 feet of a number of community facility and open space resources listed above but would not affect the use or operation of the community facilities or the public use and enjoyment of the parkland and open space.

Therefore, the Build Alternative would not result in an adverse effect to community facilities, parkland, or publicly-accessible open space and would not result in disproportionately high and adverse effects on minority or low-income populations.

SOCIOECONOMIC CONDITIONS

The Build Alternative would not increase commuter rail service or otherwise induce population growth. There would be no direct or indirect temporary or permanent displacement of businesses or residences in the study areas. As a result, no impact to population density, population projections, or the percentage of elderly/disabled populations is expected. As the proposed Project is located within an existing industrial area and railroad right-of-way, the proposed Project would not affect neighborhood cohesiveness or demographics. Construction of the Build Alternative would generate short-term economic benefits from the creation of temporary construction jobs, the wages paid to construction workers, and the indirect economic activity generated from the direct expenditures in the regional economy. The Build Alternative

would not result in adverse effects to socioeconomic conditions and would not result in disproportionately high and adverse socioeconomic effects on minority or low-income populations.

AIR QUALITY

Although the proposed Main Facility would use combined-cycle gas turbine technology and high-efficiency air emission control technology, overall air emissions would increase. However, air emissions would be minimized via state-of-the-art pollution controls (selective catalytic reduction [SCR] and oxidation catalyst systems) incorporated into the design of the Main Facility. Air quality modeling was conducted for the Project using standard EPA modeling techniques and applicable meteorological data. The study area for the air quality modeling analysis (receptor grid) extended approximately five miles from the Main Facility's stacks. Pollutant concentrations for all pollutants of concern were predicted to be below the applicable ambient air quality standards or thresholds, including the National Ambient Air Quality Standards (NAAQS). The NAAQS are set to be protective of public health. As designed, the preferred equipment option of the Build Alternative for the Main Facility (Preferred Alternative Project Component A) would not cause significant air quality impacts. The Hudson County Correctional Facility is the closest sensitive use and is more than 7,000 feet to the south of the Main Facility. Concentrations at this location would be well below the applicable NAAQS and impact thresholds. The nanogrid would operate only during emergencies and for monthly testing and maintenance. The short-term emissions associated with testing and maintenance would not notably affect daily and annual criteria pollutant levels and would not have the potential to exceed the NAAQS.

Based on the distance from the Main Facility to residential and other sensitive uses, the construction of the Main Facility would not have the potential to adversely affect air quality at those uses. Construction of all other Project Components would be of shorter duration. Based on the anticipated construction activities, distances to sensitive receptor locations, and air quality control measures that would be implemented, construction of Project Components C through G would not have the potential to adversely affect air quality. Therefore, the concentration increases associated with the operation of the Main Facility, testing and maintenance of the nanogrid, and the proposed Project construction would not be adverse and no disproportionately high and adverse air quality effects on minority or low-income populations would occur.

VISUAL

The Main Facility (Preferred Alternative Project Component A), and Project Components B, C, and D would be constructed in an existing industrial area and would not block any important views within the Hackensack River or Passaic River viewsheds or result in an adverse visual effect at residential locations.

The new substation associated with Preferred Alternative Project Component E would be consistent with the existing industrial and transportation infrastructure as well as the surrounding visual character. The nanogrid would be located in a highly-developed urban area, but would be similar in character with its surroundings, which already include industrial infrastructure, warehouses, and rail facilities. The equipment installed for the nanogrid would be up to 25 feet above the ground and smaller in scale than existing infrastructure in the study area, and therefore would not have an adverse visual effect.

Proposed monopoles east of the Hackensack River associated with Preferred Alternative Project Component E would be visible but would be no more than 65 feet tall. While the New Jersey Historic Preservation Office (NJHPO) found that Preferred Alternative Project Component E monopoles and other elements would result in a direct and cumulative visual adverse effect to the DL&W Railroad Historic District, this adverse effect would not affect the local population. The local population has limited opportunity to view this historic resource, which is part of an actively-used rail right-of-way outside of residential areas and for the most part not accessible to the public. In addition, the draft Programmatic Agreement (PA) between FTA, NJHPO and NJ TRANSIT includes measures to avoid, minimize, or mitigate adverse effects to historic resources.

The monopoles associated with Preferred Alternative Project Components F and G would not adversely affect visual quality, since they would be similar in scale and character to existing infrastructure prevalent throughout the study area.

Some aspects of the proposed construction activities would be visible to the public, but none of the construction activities or equipment would block sensitive views or result in a long-term adverse effect on any viewer groups. Therefore, the Build Alternative would not result in adverse visual effects and would not result in disproportionately high and adverse visual effects on minority or low-income populations.

HISTORIC RESOURCES

The Build Alternative would result in an adverse effect on historic properties, including the Old Main Delaware, Lackawanna and Western (DL&W) Railroad Historic District, the Bergen Tunnels western portal, the West End Through Truss Bridges, the West End Interlocking Tower, the Hackensack River Lift Bridges Historic District, the Lower Hack Draw Bridge and the DL&W Railroad Boonton Line Historic District. The draft PA between FTA, NJHPO and NJ TRANSIT includes measures to avoid, minimize, or mitigate adverse effects. The adversely affected historic properties are generally not accessible to the public, except while on board the trains that used the rail corridor in the study area. Although the Build Alternative would adversely affect historic properties, the effect on the local population would not be adverse and would not result in disproportionately high and adverse effects on minority or low-income populations.

TRAFFIC AND PUBLIC TRANSPORTATION

During operation, the traffic generated by the Main Facility (Preferred Alternative Project Component A) for approximately 30 full-time employees would be minimal and easily accommodated into the traffic network with little noticeable effect. Other Project Components would not be associated with full-time employment or regular employee commutes. The Build Alternative would provide resilient electric power to Amtrak and NJ TRANSIT rail lines, including emergency conditions that disrupt the commercial power grid, resulting in benefits to the public transportation system, as well as vehicle traffic during emergencies. Construction of the Main Facility and other Project Components would result in minor increases in vehicular traffic from workers traveling to and from the site and from deliveries of equipment and materials. These increases would be temporary and would not have a notable adverse effect on the regional highway and roadway network. Off-street parking would be available for construction workers

on NJ TRANSIT and Amtrak properties and other transportation rights-of-way. Existing NJ TRANSIT and Amtrak access points would be used to access the construction sites.

Work along the existing railroad rights-of-way would be closely coordinated with NJ TRANSIT and Amtrak to ensure continued passenger rail operations throughout construction. Some limited and planned service disruptions may be required to accommodate the construction activities; however, these would be infrequent and managed to minimize disruption to commuters. Overall, the Build Alternative would result in a transportation benefit to the public. The Build Alternative would not result in adverse effects to traffic and transportation and would not result in disproportionately high and adverse effects on minority or low-income populations.

NOISE AND VIBRATION

There are no land uses sensitive to noise or vibration within the distances that could be affected with the Build Alternative during operation, based on federal noise and vibration guidance, as discussed in Chapter 11, "Noise and Vibration." Noise and vibration levels at sensitive receptor locations (more than 0.7 miles away for the Main Facility [Preferred Alternative Project Component A] and new Kearny Substation [Preferred Alternative Project Component D], more than 330 feet away from the new NJ TRANSITGRID East Hoboken Substation [Preferred Alternative Project Component E], and more than 600 feet away from the nanogrid [Preferred Alternative Project Component F]), would not be affected by the Build Alternative during operation. Preferred Alternative Project Component B and electrical lines associated with Preferred Alternative Project Components C, D, E, and G would not generate notable noise or vibration. Once operational, noise from the proposed Project would be minimal in residential or other sensitive areas due to the industrial setting of the Main Facility and distance to sensitive receptors from the new NJ TRANSITGRID East Hoboken Substation and the nanogrid at HBLR Headquarters. Therefore, the Build Alternative would not result in adverse noise effects or disproportionately high and adverse noise and vibration effects on minority or low-income populations.

The noisiest construction activity would be the pile driving phases at the Main Facility [Preferred Alternative Project Component A] and new Kearny Substation [Preferred Alternative Project Component D], which would last approximately twelve months. While noise generated from pile driving would be audible at surrounding industrial properties, no noise-sensitive receptors are located near the Main Facility site or new Kearny Substation. The foundation for the nanogrid (Preferred Alternative Project Component F), which would be located over 600 feet from a residential area, may also require pile driving but would be of a shorter duration and would be performed during daytime hours. Construction of the electrical lines associated with Preferred Alternative Project Components E and G would entail some noise-generating activities, including excavation and boring with an auger. The noise would be audible to nearby residents and workers. This electrical line work would, however, proceed sequentially along the corridor and construction would not be sustained in any given location for an extended period of time (i.e., two weeks). Based on the typical construction equipment and methods proposed, vibration levels at sensitive receptors in the study area are expected to be well below levels that cause cosmetic and structural damage. Therefore, construction of the Build Alternative would not result in adverse noise

effects or disproportionately high and adverse noise and vibration effects on minority or low-income populations.

NATURAL RESOURCES

NJ TRANSIT proposes to install a new water supply line, with a connection to the existing main water line. No surface or ground water will be used for water supply under the Build Alternative. To ensure no potential soil or groundwater contamination migrates offsite during construction, preventative BMP measures will be applied along with the use of double/multi-cased piles for building foundation.

Once constructed sanitary wastewater generated by the Main Facility will be discharged directly into the closed loop local sewer system and stormwater will be discharged into the Hackensack River, following pre-treatment for suspended solids in a vortech filtering unit and settlement period in a detention basin, as discussed in Chapter 15, "Utilities." There are no USEPA sole source aquifers within the project area, and the Hackensack River is not a reservoir. All reservoirs within the Hackensack River Basin are located upstream. No significant adverse impacts would result to the public's potable water supply or water quality under the Build Alternative.

Although portions of the Build Alternative are within identified floodplains, project activities will be in compliance with the Flood Hazard Area (FHA) and NJDEP regulations to ensure no flood water displacement (zero net flood displacement). Pursuant to the FHA Control Act Rules (7 N.J.A.C. § 13), the proposed work in a tidally influenced floodplain will not cause significant floodplain impacts or loss of flood storage capacity.

Up to two acres of low resource value isolated wetlands would be lost as a result of the Build Alternative. Through mitigation, however, the project will support the restoration of up to five acres of high value, functional wetlands within a contiguous tidal marsh and aquatic nursery, located in the NJ Meadowlands. This Mitigation would support avian species that migrate to the Meadowlands via the Atlantic Flyway. The Atlantic Flyway encompasses some of the hemisphere's most productive ecosystems, including forests, beaches, and coastal wetlands. It is estimated that more than 285 species of birds visit the Meadowlands yearly. Improvements such as restoration of these resources will serve to continue localized environmental education programs in the NJSEA that service local and EJ communities that utilize the local and visiting school systems.

The two acres of wetlands/waters to be filled are isolated and provide minimal water quality benefits, and do not serve as a natural storm surge protection barrier from flooding or rising sea levels. In contrast the restored five acres of high value, functional wetlands located within a contiguous tidal marsh of the NJSEA will contribute to a larger system with water quality and collectively functions as the first natural defense for the surrounding communities to flooding and sea level rise.

This is a confined isolated wetland area of the NJ Meadowlands (NJSEA) that is proximal to rail traffic, electrification and therefore for safety reasons is not accessible by the public for fishing, birding, canoeing/kayaking, etc. The isolated nature of Cedar Creek Marsh South also prevents recreational navigation access from the Hackensack River to this area.

As discussed in Chapter 12, the Hackensack River in the proposed Project area was in non-attainment of SWQS for New Jersey Waters for aquatic life (general) and for fish consumption (NJDEP 2016). This means that relevant pollutant levels exceeded the NJDEP SWQS for these uses. Waters near the Koppers Koke Site are in full attainment for industrial water supply. According to NJDEP, insufficient data exist to designate attainment status for the Hackensack River near the proposed Project area for primary and secondary contact recreation, drinking water supply, or agricultural water supply (NJDEP 2016). Further concluding that filling wetland/waters in the project area will not eliminate a resource that is of current use to EJ communities or the general public for recreation or consumption.

As the local population does not directly depend on these natural resources, the adverse effects to natural resources would not have an adverse effect on the local population and would not result in disproportionately high and adverse effects on minority or low-income populations.

SOILS AND GEOLOGY

The Build Alternative would have no effects on soils and geology once constructed. The potential for erosion and sedimentation during construction activities will be addressed using Soil Erosion and Sediment Control (SESC) and Best Management Practices (BMPs), as discussed in Chapter 13, "Soils and Geology." The Build Alternative would not result in adverse effects or disproportionately high and adverse soils and geology effects on minority or low-income populations.

CONTAMINATED MATERIALS

Construction of the Build Alternative has the potential to expose historic fill, contaminated soil and/or groundwater at several sites throughout the project corridor. A search of regulatory databases for contaminated materials indicated that four potentially contaminated sites would be affected by the proposed construction activities, including Koppers Koke Site, Meadowland Maintenance Complex (MMC), Hoboken Yard, and Hudson County Chromate 202 (Caven Point Avenue). Additionally, portions of Kearny peninsula are underlain by historic fill and chromite ore processing residue (COPR). This fill may contain elevated levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), dioxins and furans, heavy metals, and hexavalent chromium. There are several Hudson County Chromate Sites located in the immediate vicinity of Preferred Alternative Project Components. While there are numerous other hazardous sites listed by the NJDEP within the 500-foot study area, utility poles and duct banks would be installed within previously disturbed areas along the transportation right-of-way and limited excavation would be needed for the installation. Contaminated sites of greatest concern that would potentially be disturbed during construction are located in industrial areas, where construction would occur primarily in locations that are not accessible to the general public.

Construction plans and specifications would provide procedures for stockpiling, testing, loading, transportation, and proper disposal of excavated materials requiring off-site disposal. A Health and Safety Plan (HASP), which would describe the site-specific health and safety procedures to minimize exposure of contaminated materials to workers and the public would be prepared. The HASP would include specifications for training of appropriate personnel, monitoring for the presence of contamination (e.g., buried tanks, drums or other containers), sludges or soils that show evidence of potential contamination

(such as discoloration, staining, or odors), and approved response plans. With the implementation of safety and environmental protocols regarding contaminated materials, the Build Alternative would not have an adverse effect related to contaminated materials and would not result in disproportionately high and adverse effects on minority or low-income populations.

UTILITIES

There is capacity in the existing utilities infrastructure systems (natural gas, water, sanitary sewer, and stormwater) to provide the needed utility connections and supply the Build Alternative with utility services. Construction of the Build Alternative would not adversely affect utilities. Rather, the Build Alternative would provide more reliable electrical infrastructure, to support immediate and long-term electrical needs for public transportation by rail. Overall, the Build Alternative would not adversely affect utilities or result in disproportionately high and adverse effects on minority or low-income populations.

PUBLIC HEALTH AND SAFETY

The industrial locations and restricted access to the Main Facility (Preferred Alternative Project Component A), natural gas pipeline connection (Preferred Alternative Project Component B), substations (Preferred Alternative Project Component D and E), and the nanogrid (Preferred Alternative Project Component F), would limit the potential public exposure to health and safety risks. Chapter 16, "Safety and Security," discusses exposure to electromagnetic fields (EMFs) with the Build Alternative. The strength of EMFs decreases rapidly with increasing distance from the electric equipment and power lines. High voltage lines would be limited to Preferred Alternative Project Component C (230kV) and Preferred Alternative Project Component D (138kV), both of which are located in industrial areas, more than 500 feet away from residential and other sensitive uses. Preferred Alternative Project Component E is associated with a much lower voltage (27kV). As demonstrated in Chapter 16, "Safety and Security," the EMF associated with the maximum voltage (230kV) drops off rapidly and is within the New Jersey guidelines. Therefore, the lower voltage (27kV and 13.2kV) would also be in compliance with the guidelines. For the portion of the electrical lines that would be installed in duct banks or through the Bergen Tunnels, EMF levels at publicly accessible locations along the route would be indistinguishable from background levels. The 27kV electrical line between the Main Facility site and the new NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E) in Jersey City would extend for a short distance above ground in areas of mixed-use development via the Morris & Essex Line right-of-way; however, there are no existing residential or other sensitive uses within a close distance to Preferred Alternative Project Component E in this section of the corridor. The electrical lines proposed along the HBLR right-of-way (Preferred Alternative Project Component G) would be relatively low voltage lines, in comparison to the other proposed electricals lines. The proposed locations of the electrical lines (on monopoles, in duct banks or attached to existing infrastructure) are within the New Jersey guidelines for EMFs. The Build Alternative would not result in high EMFs at residential and other sensitive receptors or disproportionately high fields in areas with minority or low-income populations.

The Build Alternative would improve safety and security in the region by providing reliable public transportation during widespread outages of the commercial power grid, and facilitating evacuation during a power outage, if it becomes necessary. Overall, the Build Alternative would not have an adverse

effect on public health and safety and would not result in disproportionately high and adverse health and safety effects on minority or low-income populations.

19.5 PUBLIC PARTICIPATION

As noted in FTA's environmental justice guidance, a key component of environmental justice is engaging environmental justice populations and considering said input as part of the transportation planning process. This allows project sponsors to understand the needs and priorities of environmental justice populations and to balance the benefits of a proposed Project against its adverse effects. Notice of availability of this DEIS was distributed widely in Spanish and English, as identified below. The notice includes information on where to view the document and how to provide comments during the public comment period.

A public scoping meeting was held on February 3, 2016 to provide information on the proposed Project, solicit input on the DEIS analysis, and respond to concerns and comments expressed by members of the local community. Full and fair participation by all potentially affected communities was encouraged in accordance with DOT's environmental justice policies. Targeted outreach to environmental justice communities included:

- Notice of the February 3, 2016 meeting was published in *the Jersey Journal*, *The Observer*, *The Star Ledger*, and *El Especialito* (in Spanish);
- Emails and fliers with February 3, 2016 public meeting information and availability of the scoping document in both English and Spanish were distributed to public libraries and the following Section 8 housing developments:
 - Montgomery Gardens, 563 Montgomery Street, Jersey City, NJ 07302
 - Booker T. Washington, 200 Colden Street, Bldg. #2, Jersey City, NJ 07302
 - Thomas J. Stewart, 88-92 Erie Street, Jersey City, NJ 07302
 - Barbara Place Terrace, 471 Pacific Avenue, Jersey City, NJ 07304
 - Glennview Townhouses I, 463 Pacific Avenue, Jersey City, NJ 07304
 - Lafayette Senior Living Center, 463 Pacific Avenue, Jersey City, NJ 07304
 - Lafayette Village, 579 Grand Street, Jersey City, NJ 07304
 - Pacific Court, 148 Bramhall Avenue, Jersey City, NJ 07304
 - Woodward Terrace, 148 Bramhall Avenue, Jersey City, NJ 07304
 - Berry Gardens, 199 Ocean Avenue, Jersey City, NJ 07305
 - Curries Woods, 3 New Heckman Drive, Jersey City, NJ 07305

- Dwight Street Homes, 315 Randolph Avenue, Jersey City, NJ 07305
 - Hudson Gardens, 27-29 Palisade Avenue, Jersey City, NJ 07305
 - Ocean Pointe East and West, 460 Ocean Avenue, Jersey City, NJ 07305
 - Gloria Robinson Court Homes, 348 Duncan Avenue, Jersey City, NJ 07306
 - Marion Gardens, 57 Dales Avenue, Jersey City, NJ 07306
 - Holland Gardens, 241 Sixteenth Street, Jersey City, NJ 07310
- For the public scoping meeting, email notifications were distributed to elected officials, and all parties who signed up via the NJ TRANSIT Resilience Program website to be on the NJ TRANSITGRID email distribution list;
 - Letter notifications for availability of this document were sent to local municipalities and elected officials; and
 - Project information on the NJ TRANSIT website was updated at <http://njtransitresilienceprogram.com>.

The scoping meeting occurred in an Americans with Disabilities (ADA)-compliant facility, and a Spanish interpreter was on-site. Information boards were posted and Project team members circulated among the boards, answering questions and describing the proposed Project to attendees. Comment forms (in English and Spanish) were available. The comment forms could be completed on site, but also included mailing and email addresses so that meeting attendees could send in comments after the meeting, if desired. Approximately eight people from the general public attended the information session, and one comment was submitted which contained no objections to the proposed Project. A summary of the comments received and meeting materials can be found in Appendix H.

20.1 INTRODUCTION

This chapter has been prepared pursuant to the requirements of Section 4(f) of the Department of Transportation (DOT) Act of 1966. Based on this Section 4(f) Evaluation, Federal Transit Administration (FTA) has determined that the proposed Project would result in the use of the Old Main Delaware, Lackawanna and Western (DL&W) Railroad Historic District, which is a Section 4(f) property. This chapter discusses the identification of Section 4(f) properties within the Area of Potential Effects (APE) for the proposed Project, describes the effect of the proposed Project on those properties, and summarizes measures to minimize harm included as part of the proposed Project.

20.2 REGULATORY CONTEXT AND METHODOLOGY

Section 4(f) of the DOT Act of 1966, as amended (23 C.F.R. Part § 774-codified in 49 U.S.C. 303 and generally referred to as “Section 4(f)”) prohibits the Secretary of Transportation from approving any program or project that requires the “use” of: (1) any publicly-owned parkland, recreation area, or wildlife/waterfowl refuge of national, state, or local significance; or (2) any land from a historic site of national, state, or local significance (collectively, “Section 4(f) properties”), unless there is no feasible and prudent alternative to the use of such land and such program and the project includes all possible planning to minimize harm to the park, recreation area, wildlife/waterfowl refuge, or historic site. A historic site is considered to be a property that is listed on, or is eligible for listing on, the National Register of Historic Places (NRHP) (“NR-listed” and “NR-eligible”). As set forth in the Section 4(f) regulations, archaeological resources are protected under Section 4(f) only when their importance is derived from their preservation in place.

A project use of a Section 4(f) property occurs when it:

- Permanently incorporates land from the property into a transportation facility;
- Temporarily occupies land in a manner that is adverse in terms of the statute’s preservation purpose; or
- Comprises a constructive use of land, which per C.F.R. Part 774.15(a) occurs “when the transportation project does not incorporate land from a Section 4(f) property, but the proximity impacts are so severe that the protected activities, features, or attributes that qualify property for protection under Section 4(f) are substantially impaired.”

In some cases, even if there is a use of a Section 4(f) property, FTA may determine that a use is *de minimis*. A *de minimis* impact determination under 23 C.F.R. Part 774.3(b) subsumes the requirement for all possible planning to minimize harm by reducing the impacts on the Section 4(f) property to a *de minimis*

level. As summarized from 49 U.S.C. 303(d)(2) FTA may make a *de minimis* determination on a historic site only if, pursuant to the Section 106 consultation process:

- The transportation program or project will have no adverse effect on the historic site, or there will be no historic properties affected by the transportation program or project;
- FTA's finding has received written concurrence from the applicable State historic preservation officer or tribal historic preservation officer (and from the Advisory Council on Historic Preservation if the Council is participating in the consultation process); and; and
- FTA has developed its finding in consultation with parties consulting as part of the Section 106 consultation process.

With respect to parks, recreation areas, or wildlife or waterfowl refuges, as summarized from 49 U.S.C. 303(d)(3), FTA may make a finding of *de minimis* impact only if:

- After public notice and opportunity for public review and comment, FTA finds that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- The finding has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.

20.2.1 Feasible and Prudent Avoidance Alternative and Least Overall Harm

A feasible and prudent avoidance alternative would avoid using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property. An alternative is not feasible if it cannot be built as a matter of sound engineering judgment. An alternative is not prudent if:

- 1) It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- 2) It results in unacceptable safety or operational problems;
- 3) After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe disproportionate impacts to minority or low-income populations; or severe impacts to environmental resources protected under other Federal statutes;
- 4) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- 5) It causes other unique problems or unusual factors; or

- 6) It involves multiple factors of the above, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

If there is no feasible and prudent avoidance alternative, FTA may approve only the alternative that causes the least overall harm in light of Section 4(f)'s preservation purpose. In accordance with C.F.R. Part 774.3 (c)(1), "least overall harm" is determined by balancing the following list of factors:

- 1) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- 2) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- 3) The relative significance of each Section 4(f) property;
- 4) The views of the official(s) with jurisdiction over each Section 4(f) property;
- 5) The degree to which each alternative meets the purpose and need for the project;
- 6) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- 7) Substantial differences in costs among the alternatives.

20.3 PROJECT DESCRIPTION

The proposed Project would include a natural gas-fired generation plant with a net generation of 104 to 140 megawatts (MW) including steam power generation from waste heat, referred to as the Main Facility (Preferred Alternative Project Component A). The Main Facility would be located in the Town of Kearny in Hudson County, New Jersey. It would be electrically connected to the Public Service Electric & Gas Company (PSE&G) system, which currently provides power to NJ TRANSIT and Amtrak facilities in the Project area. Under normal conditions, the microgrid would have the capacity to import from, and export into, the larger commercial grid 24 hours per day, seven days per week (24/7). When the existing commercial power grid is fully available, the microgrid would operate in parallel with it, providing dedicated power for railroad operations to meet electrical demand in the most reliable and cost-effective manner, offsetting commercial power grid supplies. Under a scenario involving a regional or local blackout condition, the microgrid would disconnect from the PSE&G commercial grid and become the primary source of power to support the following services, subject to further design and concept verification:

- Limited commuter rail service on Amtrak's Northeast Corridor between New York Penn Station and County Yard/Jersey Avenue Station in New Brunswick (approximately 32.8 rail miles) via connection to a new Kearny Substation;
- Limited NJ TRANSIT commuter rail service between Hoboken Terminal and Millburn Station on the Morris & Essex Line (approximately 16.3 rail miles), via a power connection to the Mason Substation; and

- Service on NJ TRANSIT’s Hudson-Bergen Light Rail (HBLR) between Tonnelle Avenue in North Bergen and 8th Street in Bayonne (approximately 16.6 rail miles), via connections to the individual traction power substations along the HBLR right-of-way.

In addition to providing traction power, the microgrid would be designed to support the following non-traction loads, to the extent technically feasible:

- NJ TRANSIT Hoboken Terminal and Yard through input to Henderson Street Substation;
- The majority of NJ TRANSIT HBLR station loads (approximately 16.6 rail miles), supported through the connections to the traction power substations mentioned above;
- Northeast Corridor signal power, Hudson River tunnel ventilation, pumping, and lighting loads for the sections of operable track from New York Penn Station to County Yard/ Jersey Avenue Station (approximately 32.8 rail miles);
- NJ TRANSIT Main Line’s operating segment signal power from the intersection with the Morris & Essex Line to the Upper Hack Lift Bridge (approximately 2.5 rail miles); and
- The NJ TRANSIT Rail and HBLR Regional Operations Centers.

Figure 1-2 in Chapter 1, “Purpose and Need,” depicts the rail service network throughout which power would be distributed during a regional or local blackout condition. The service territory was chosen to support an overall service goal of transporting as many customers as possible between key nodes in NJ TRANSIT’s core public transit system. The proposed Project would be a resilient system that also facilitates emergency transportation for commuters from work to place of residence. Newark, New Jersey, and Manhattan, New York, represent areas with very high transit dependency for work and non-work trips.

The Build Alternative includes the Main Facility and other power distribution infrastructure needed to support the core service territory—including several substations, various electrical lines, and other elements that extend throughout the Project Area. The Build Alternative is presented in the EIS and Table 20-1 as “Preferred Alternative Project Component A” through “Preferred Alternative Project Component G” (see Figure 2-1 in Chapter 2, “Project Alternatives”).

Table 20-1 - Build Alternative Project Components

Project Component	Description
Preferred Alternative Project Component A: Main Facility	Combined-cycle gas turbine plant <ul style="list-style-type: none"> - 5 natural gas turbines (21MW to 25MW each) <ul style="list-style-type: none"> o With 2 connected to heat recovery steam generators (HRSGs) - 1 steam turbine (14MW to 18MW) - 2 emergency black start engines (not to exceed 2.5MW)* Four-acre solar panel facility over stormwater retention basin (approximately 0.6MW) Static Frequency Converter yard 230 kilovolt (kV) substation
Preferred Alternative Project Component B: Natural Gas Pipeline Connection	New metering station and connections to existing natural gas pipelines on six-acre parcel
Preferred Alternative Project Component C: Electrical Lines to Mason Substation	0.7-mile electrical line (combination of new monopoles up to 220 feet tall, and underground duct banks); 230 kV at 60 Hz
Preferred Alternative Project Component D: Electrical Lines and New Kearny Substation	1.47-mile electrical line within NJ TRANSIT’s Meadowlands Maintenance Complex (MMC) property (new monopoles up to 220 feet tall, and underground duct banks); 138 kV at 25 Hz New Kearny Substation
Preferred Alternative Project Component E: Electrical Lines and New NJ TRANSITGRID East Hoboken Substation	3.0-mile electrical line consisting of: <ul style="list-style-type: none"> - 0.8 miles within industrial Kearny (combination of new monopoles up to 220 feet tall, and underground duct banks); 27 kV at 60 Hz - 0.2 miles crossing Hackensack River (aerially 50 feet north of Lower Hack Bridge via new poles up to 220 feet, one pole on each side of the river bank; 27 kV at 60 Hz) - 0.7 miles within industrial Jersey City (combination of new monopoles up to 65 feet tall [with exception of one pole for river crossing – see above], and underground duct banks; 27 kV at 60 Hz - 0.8-mile segment within the south tube of Bergen Tunnel; 27 kV at 60 Hz - 0.22 miles from Bergen Tunnel to new NJ TRANSITGRID East Hoboken Substation (combination of new monopoles up to 65 feet tall and underground duct banks); 27 kV at 60 Hz - 0.28 miles from new NJ TRANSITGRID East Hoboken Substation to Henderson Street Substation, (combination of new monopoles up to 65 feet tall, underground duct banks and attachment to existing transportation infrastructure [HBLR]); 13.2 kV at 60 Hz - new NJ TRANSITGRID East Hoboken Substation
Preferred Alternative Project Component F: Connection to HBLR South	HBLR Headquarters Nanogrid: two approximately 2MW natural gas-fired emergency generators and stored energy installed on elevated platform in NJ TRANSIT-owned property

Project Component	Description
Preferred Alternative Project Component G: HBLR Connectivity	14.4-mile electrical line on combination of new monopoles (up to 39 feet high), underground duct banks or attachment to existing infrastructure (HBLR elevated tracks); 13.2 kV at 60 Hz <ul style="list-style-type: none"> - 6.6 miles from Tonnelle Avenue station in North Bergen to the Harismus Cove station in Jersey City - 1.6 miles from HBLR Headquarters to West Side Avenue station in Jersey City - 6.2 miles from Jersey Avenue station to 8th Street station in Bayonne

***Note:** the actual plant output is reduced due to temperature and parasitic loads. Therefore, the total output would be less than the MW output for which each turbine is designed.

20.4 PURPOSE AND NEED

The need for the proposed Project is based on the vulnerability of the commercial electric power grid that serves NJ TRANSIT’s and Amtrak’s Northeast Corridor commuter rail service. The purpose of the proposed Project is to enhance the resiliency of the electricity supply to the NJ TRANSIT and Amtrak infrastructure that serves key commuter markets in New York and New Jersey to minimize public transportation service disruptions and facilitate emergency transportation during an impending storm or power loss. Power outages are occurring more frequently due to the nature and age of the existing centralized power distribution system and the intensity and frequency of severe weather events or potential man-made disruptions.

Following Superstorm Sandy in 2012, the U.S. Department of Energy (DOE) partnered with the State of New Jersey to examine the use of microgrids to help supply electricity during future extreme weather events. The proposed Project is a result of that partnership and it is designed to meet the objectives of national and state energy goals by contributing to diverse portfolios of new, cleaner, and more resilient energy generation systems.

20.5 SECTION 4(F) PROPERTIES

20.5.1 Historic Architectural Resources

Historic resources identified through the Section 106 process are considered Section 4(f) properties. In accordance with Section 106, a comprehensive Historic Architectural Resources Background Survey (HARBS) and Effects Assessment (EA) Report was prepared to identify all historic architectural resources eligible for, or potentially eligible for, the State or National Register of Historic Places (S/NR-listed or S/NR-eligible) (RGA 2017a). The survey examined 93 historic resources that were previously identified as listed or eligible. In addition, the survey identified 63 resources more than 50 years old and evaluated their potential for historic significance. The New Jersey Historic Preservation Office (NJHPO) Consultation Comments Letter dated April 24, 2018 included new Opinions of Eligibility regarding the resources within the APE. The NJHPO found that the proposed Project would not have an effect on the following historic resources: the Jersey City Water Works Historic District, the Erie Railroad Bergen Archways Historic District, the Hudson and Manhattan Railroad Transit System (PATH) Historic District, the Jersey City Water

Works Pipeline, the Wittpenn Bridge, the PRR Harsimus Branch (Conrail/CSX) Bridge over the Hackensack River, the PRR (PATH) Bridge over Hackensack River, the JFK Boulevard Bridge, the Palisades Avenue Bridge, the Morris Canal, the Holland Tunnel, the L.O. Koven & Brothers Sheet Iron and Plate Steel Works, the North (Hudson) River Tunnels, the Lincoln Tunnel, and the West Shore Railroad Tunnel.

The proposed Project is not expected to permanently incorporate any of the above-listed Section 4(f) properties into a transportation facility or result in the temporary occupancy of Section 4(f) land that is adverse in terms of the statute's preservation purpose. The proposed Project would also not result in proximity impacts so severe that the protected activities, features, or attributes that qualify property for protection under Section 4(f) would be substantially impaired. Therefore, the FTA finds that the proposed Project would not result in the Section 4(f) use of the above-listed resources.

The NJHPO found that the proposed Project would have an effect (but not an adverse effect), on the following historic resources: the PRR New York to Philadelphia Historic District, Substation 4, Substation 41, the PRR New York Bay Branch Historic District, the Essex Generating Station, the Public Service Electric Gas Company (PSE&G), Kearny-Essex-Marion Interconnection Historic District, the People's Gas Light Company/PSE&G Marion Office Historic District, the US Route 1 Extension (Pulaski Skyway) Historic District, the US Routes 1 & 9 Historic District, the New Jersey Midland Railway/New York, Susquehanna and Western Railroad Historic District, the Erie Railroad Main Line Historic District, the Edison Battery Company Property, the PSE&G Kearny Generating Station, St. Peter's Cemetery, the Erie Railroad Bergen Hill Tunnel, the Jersey City High School, the Holbrook Manufacturing Company, the Continental Can Company Complex, the Lackawanna Warehouse and Viaduct, the Grove Street Bridge, the Engine Company #3, Truck #2 Firehouse, the Erie-Lackawanna Terminal, Hoboken Yard/Henderson Street Substation, Belvedere Court, the R. Neumann & Co. Factory Complex, the Hoboken Historic District, the Mechanic's Trust Company, the Bayonne Trust Company, the East 17th Street Apartment Buildings Streetscape, the Maidenform Brassiere Company, the East 19th Street Streetscape, the Mount Carmel Historic District, the YMCA of Bayonne, Public School Number 5 in the City of Bayonne, the Lehigh Valley Railroad Historic District, the PRR New York Bay Branch Historic District, the Hanover National Bank Repository, the Communipaw-Lafayette Historic District, the Ocean Avenue Bridge, the Bergen Avenue Bridge, the Former Candy Factory, the Paulus Hook Historic District, the Van Vorst Park Historic District, the One Exchange Place (Bank Building), the Commercial Trust Company Bank, the Hudson and Manhattan Railroad Powerhouse, the Warehouse Historic District, the Great Atlantic and Pacific Tea Company Warehouse, the Butler Brothers Warehouse, the Pohlmann's Hall, 269-271 Ogden Avenue, 268-272 Ogden Avenue, the Ferguson Brothers Manufacturing Company, the Old Hillside Road Trolley Horseshoe Curve, NJ Route 3 (NJ 495) Highway Approach to Lincoln Tunnel Historic District, NJ Route 495 Viaduct, the Lincoln Tunnel Entrance and Ventilation Buildings, and the King's Bluff Historic District.

The historic properties listed above are located within the architectural APE, as defined in consultation with the NJHPO under Section 106 of the National Historic Preservation Act (NHPA); however, they would not be used by the proposed Project. The proposed Project is not expected to permanently incorporate any of these Section 4(f) properties into a transportation facility or result in the temporary occupancy of Section 4(f) land that is adverse in terms of the statute's preservation purpose. While the context of some of these resources would be somewhat altered by the proposed Project, the protected activities, features,

or attributes of the resources would not be substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished. The proposed Project would not substantially diminish the significance of historic properties listed above that qualifies them for inclusion in the NRHP. Therefore, the proposed Project would not constitute a Section 4(f) use of these properties and no further analysis is necessary.

The NJHPO found that the proposed Project would result in a direct adverse effect as well as a cumulative visual effect on the Old Main DL&W Railroad Historic District and an adverse visual effect on historic resources that contribute to the Historic District. A description of the Old Main DL&W Railroad Historic District and its contributing resources is presented below.

Old Main DL&W Railroad Historic District and its Contributing Resources

The Old Main DL&W Railroad Historic District is eligible for listing in the NRHP under Criterion A for its association with suburbanization, as well as for commuter, passenger, and freight traffic. The construction of the line advanced the development of suburban communities in northern New Jersey by providing accessible transportation into New York City via the ferries at Hoboken. The resource is also eligible for listing in the NRHP under Criterion C for its contributions to the field of engineering. The construction of the line across the challenging terrain of northern New Jersey required the construction of numerous bridges and tunnels. Most notably, the railroad undertook a major rebuilding effort in the early twentieth century that involved a pioneering and comprehensive use of concrete construction technology.

The Historic District extends over 80 miles across New Jersey, from the Hudson River at the east end to the Delaware River at the west end. Approximately 4.5 miles of the Old Main DL&W Railroad Historic District are encompassed within the proposed Project area. Numerous contributing resources have been identified within the Old Main DL&W Railroad Historic District. Contributing resource types include railroad stations, bridges, tunnels, interlocking towers and signal equipment, culverts, catenary and electrical system structures, civil engineering features (cuts, fills, embankments, retaining walls), railway yard facilities, and branch or side tracks. The contributing resources to the Old Main DL&W Railroad Historic District that are within the proposed Project APE for architectural resources are described below.

- **The Old and New Bergen Tunnels** are parallel tunnels that cut through the trap rock of Bergen Hill and each carry two rail lines. The Old Bergen Tunnel was built in 1876 and the New Bergen Tunnel was built in 1908. The old tunnel carries the westbound tracks for the Morris & Essex Line while the new tunnel carries the eastbound tracks. The Old Bergen Tunnel is technologically significant for its association with the development of transportation and commerce in the late nineteenth century, and the New Bergen Tunnel is technologically significant for the innovative use of concrete in response to an increase in railroad freight operations during the early twentieth century. The Old and New Bergen Tunnels were determined eligible for listing in the NRHP under Criteria A and C in the areas of Transportation and Engineering.
- **The West-End Through Truss Bridges** are steel bridges at milepost 1.89 on the Morris & Essex Line, built in 1908 for the DL&W Railroad. The West-End Through Truss Bridges are the only trusses surviving on Morris & Essex Line and are technologically significant as an example of heavy

trusses used in railroad construction. The truss bridges were determined individually eligible for listing in the NRHP under Criteria A and C in the areas of Transportation and Engineering.

- **The Delaware, Lackawanna and Western (DL&W) Railroad Boonton Line Historic District** (a.k.a. NJ TRANSIT Main Line) is eligible for listing in the NRHP under Criteria A and C for its associations with freight and passenger service, and for spurring the growth and development of industries and residences along the alignment. The DL&W Rail Road leased the Morris & Essex Railroad in 1868, then constructed and opened the so-called Boonton Cut-off in 1869-1870 to channel coal and freight traffic off the old Morris & Essex Railroad main line between Boonton and Hoboken. The Boonton Branch was built to the highest engineering standards of the day with gentle grades, long tangents, and generous curves for the efficient movement of freight. Construction and operation of the branch helped to solve problems with freight congestion and geographic impediments on the former Morris & Essex Railroad main line.
- **The West End Interlocking Tower** was built in 1909 and was used to control the junction between the DL&W Railroad Boonton Line and the Morris & Essex Line. At present, the tower is used as office and storage space for rail maintenance and no longer functions as an interlocking tower. The West End Interlocking Tower was determined individually eligible for listing in the NRHP under Criteria A and C in the areas of Transportation, Engineering, and Architecture.
- **The Lower Hack Draw Bridge and Hackensack River Lift Bridges Historic District** is a vertical lift bridge designed and built in 1927 by internationally-renowned engineer John Alexander Low Waddell. The bridge carries three railroad lines across Duffield Avenue in Jersey City and the Hackensack River. Both reinforced concrete and steel comprise the structural components of the bridge. The Lower Hack Draw Bridge is individually eligible for inclusion in the NRHP under Criteria A and C in the areas of Transportation and Engineering. In addition to being a contributing resource of the Old Main DL&W Railroad Historic District, the bridge is also a contributing resource to the Hackensack River Lift Bridges Historic District.

The Hackensack River Lift Bridges Historic District includes three other individually eligible bridges: Wittpenn Bridge, Pennsylvania Harsimus Branch Bridge, and Pennsylvania Railroad Bridge. All four are post-World War I vertical lift bridges that are eligible under NRHP Criteria A and C in the areas of Transportation and Engineering. The district represents largely unaltered, operable, and increasingly rare examples of historically and technologically significant bridge types. The district's period of significance is 1928 to 1930.

The Effects of the Proposed Project on the Old Main DL&W Railroad Historic District and its Contributing Resources

The proposed Project would result in the following changes to the Old Main DL&W Railroad Historic District and its contributing resources:

- Installation of the electrical line within a precast duct bank at grade between the northernmost track and the north wall of the New Bergen Tunnel (the south tunnel), which is part of the Old and New Bergen Tunnels.
- Placement of the electrical line across the top of the southern West-End Through Truss Bridge.²¹
- Installation of approximately 60 new monopoles within the Old Main DL&W Railroad Historic District as follows:
 - 5 new poles up to 65 feet tall between the Old and New Bergen Tunnels' eastern portals and the new NJ TRANSITGRID East Hoboken Substation.²²
 - 24 new poles, up to 65 feet tall, between the Old and New Bergen Tunnels' western portals and the Hackensack River.
 - Two monopoles up to 220 feet tall, one on each bank of the Hackensack River, by the Lower Hack Draw Bridge.
 - 29 new poles, up to 220 feet tall, between the Hackensack River and Amtrak's Substation No. 41.

The installation of the proposed duct banks for the electrical line would not directly alter the Old and New Bergen Tunnels and would not degrade important historic design elements of the tunnel. The exact placement and attachment method for the electrical lines to the West-End Through Truss Bridges has not yet been determined. As project plans are finalized, care would be taken to design and install this section of the electrical line in a way that would minimize impacts to the historic fabric of the bridges and would be guided by the *Secretary of the Interior's Standards*.

The proposed five new poles between the Bergen Tunnels' eastern portals and the new NJ TRANSITGRID East Hoboken Substation would be visible but would not adversely affect the visual character of the Old Main DL&W Railroad Historic District or its contributing resources, based on the relatively small number of poles in this section of the corridor. The proposed 24 new 65-foot-tall poles between the western portals of the Old and New Bergen Tunnels and the Hackensack River would exceed the height of the existing catenaries and signal bridges in this section of the corridor. According to NJHPO, this portion of the rail line has maintained a high level of integrity, both in terms of the line itself and its setting. The new 65-foot-tall poles would visually affect the Old Main DL&W Railroad Historic District and its contributing resources, including: the Bergen Tunnels' western portals (part of the Old and New Bergen Tunnels), the West-End Through Truss Bridges, the West End Interlocking Tower, the DL&W Railroad Boonton Line Historic District, and the Lower Hack Draw Bridge. The corridor and the Lower Hack Draw Bridge would also be affected by the proposed monopoles on each bank of the Hackensack River, which would be up to 220 feet tall. NJHPO found that the pole immediately west of the Lower Hack Draw Bridge would have

²¹ Conceptual plans at 10 percent design that were shared with NJHPO contemplated the electrical line in a conduit across the top of the West-End Through Truss Bridges. The 10 percent design also considered the possibility of attaching the conduit to the top member of one of the bridges. The design has since advanced and the attachment of the conduit to the West-End Through Truss Bridges is no longer proposed. Instead, this section of the electrical line would feature an aerial lashed cable.

²² As the engineering design advances, the number of poles that would be within the boundaries of the Historic District may be further refined and reduced.

an adverse effect on the bridge and the two historic districts to which the bridge contributes. The 29 poles to the west of the Lower Hack Draw Bridge that would be up to 220 feet tall would visually affect the Old Main DL&W Railroad Historic District. This portion of the District has maintained a high level of integrity within the corridor right-of-way, however its setting has been compromised due to the construction of multiple surrounding poles ranging in height from 105 to 300 feet.

Section 4(f) Use of the Old Main DL&W Railroad Historic District and its Contributing Resources

Overall, none of the proposed Project elements alone would result in conditions that would constitute a Section 4(f) use of the Old Main DL&W Railroad Historic District or its contributing resources. Individual poles would not result in a substantial impairment of historic features that make the Old Main DL&W Railroad Historic District, its contributing resources, or the Hackensack River Lift Bridges Historic District eligible for inclusion in the NRHP.

Taken cumulatively, the proposed Project elements would also not result in a Section 4(f) use of the individually-eligible resources contributing to the Old Main DL&W District or in a Section 4(f) use of the Hackensack River Lift Bridges Historic District. While the individually-eligible historic resources contributing to the Old Main DL&W Railroad Historic District would be visually affected, the number of poles affecting any one resource would be small. The proposed Project would not result in a substantial impairment of the features that make the resources contributing to the Old Main DL&W Railroad Historic District individually eligible for listing in the NRHP. Therefore, the proposed Project would not result in a use of Section 4(f) properties that are individually-eligible historic resources that contribute to the Old Main DL&W Railroad Historic District.

However, the cumulative effect from all of the proposed Project elements on the resources contributing to the Old Main DL&W Railroad Historic District and the overall effect of the proposed Project on the integrity and setting of the Old Main DL&W Railroad Historic District would result in a Section 4(f) use of the Historic District. Cumulatively, the proposed Project elements would diminish the integrity and alter the setting of portions of the Historic District where the integrity has been preserved. Therefore, the proposed Project includes an evaluation of alternatives that would avoid the Section 4(f) use and all possible planning to minimize harm.

20.5.2 Archaeological Resources

Section 4(f) regulations apply to archaeological sites (including those discovered during construction) that are on or eligible for inclusion on the National Register and that warrant preservation in place. A Phase IA Archaeological Survey was prepared for the proposed Project and is summarized in Chapter 9, "Historic Resources." The archaeological survey found that the APE for the proposed Project has applied low to high sensitivity for prehistoric archaeological resources and moderate sensitivity for historic archaeological resources for specific project components. "Supplemental Information for the Phase IA Archaeological Survey (Phase IA)" was also prepared and submitted to the NJHPO.

Areas of high prehistoric archaeological sensitivity comprise locations where intact buried land surfaces were identified in Project Components A, C, D and E. Areas where extensive prior ground disturbance has

occurred have low prehistoric archaeological sensitivity. Areas of moderate to high historic archaeological sensitivity comprise locations in Project Components A, C, D, E, F and G proximate to previously identified archaeological sites and listed or eligible historic properties and historic districts, including the Jersey City Water Works Pipeline, the Jersey City Water Works Historic District, the Covert/Larch Historic District, the New York, Susquehanna, and Western Railroad Engine Repair Site, and St. Peter's Cemetery. Areas of moderate to high historic archaeological sensitivity comprise locations in Project Component G proximate to the Morris Canal, identified historic archaeological sites, and locations where intact historic land surfaces have been identified. The areas of archaeological sensitivity are presented on Figures 9-3 through 9-8 in Chapter 9, "Historic Resources," and in Appendix C.

As described in Chapter 9, "Historic Resources," studies to identify the potential for significant historic resources within the project area included a Phase IA Archaeological Survey and historic architectural site surveys. Based on the Phase IA Archaeological Survey, archaeological resources, if present, would most likely be important for the information they might yield and not for preservation in place. Therefore, these potential archaeological resources are not considered Section 4(f) properties. If, however, based on further study and consultation with NJHPO, FTA and NJ TRANSIT determine that any archaeological resources present within the project site derive their value from preservation in place, NJ TRANSIT will supplement this Section 4(f) Evaluation. The NJHPO Consultation Comments Letter, dated April 24, 2018 (see Appendix C) stated that based on other recent projects, archaeological monitoring of mechanically excavated monopoles is not effective in recovering useful archaeological data. Therefore, NJHPO recommended only archaeological monitoring for the installation of utilities and duct banks within areas of archeological sensitivity identified in the Phase IA report and supplemental information in Appendix D. The NJHPO Consultation Comments Letter also noted that the New Jersey Junction Railroad-to-Newark Avenue Iron Viaduct (Substructure Only) is located within Project Component F, Section I (as noted in the Supplemental Information provided for the Phase 1A Survey) and is eligible for inclusion in the State and National Register. NJHPO would require archaeological monitoring for any utility and/or duct banks proposed within this eligible resource.

20.5.3 Wildlife or Waterfowl Refuge Areas

There are no wildlife or waterfowl refuge areas of national, state, or local significance within the proposed Project study area and no wildlife or waterfowl refuge areas would be affected by the proposed Project. Therefore, the proposed Project would not result in the Section 4(f) use of any such resources.

20.5.4 Publicly-Owned Parkland and Recreational Areas

The publicly-owned parks and recreational resources within the proposed Project study area are listed below, by park location.

- The Township of Lyndhurst
 - Richard W. DeKorte Park
- Town of Secaucus
 - Laurel Hill Park

- City of Jersey City
 - Lincoln Park and Lincoln Park West
 - Terrace Avenue Park and Edward Crincoli Park
 - Leonard Gordon Park
 - Pershing Field Park
 - LaPointe Park
 - Boyd McGuinness Park
 - Liberty State Park
 - Reservoir No. 3
 - Newport Green Park
 - J. Owen Grundy Park
 - General Nathanael Greene Park
 - Morris Canal Park
 - Berry Lane Park
 - Bayside Park
- The Township of Weehawken
 - Old Glory Park
 - Hamilton Park
 - Weehawken Dueling Grounds
 - Weehawken Waterfront Park and Recreation Center
 - 19th Street Basketball Courts
- City of Hoboken
 - Sixteen Hundred Park
 - Riverview Park
 - Mama Johnson Park
 - Gateway Park
- City of Union City
 - Firefighters Memorial Park
 - Washington Park
- City of Bayonne
 - Russell Golding Park
 - Sister Mariam Theresa Park
 - 11th Street Park
 - Edward F. Clark Park

See Chapter 4, “Community Facilities,” for a description of each of these parks. Additionally, there are two planned residential developments, as described in Chapter 4, “Community Facilities,” in Jersey City near the proposed electrical line routes that will include publicly-accessible open space. The former Van Leer Chocolate Factory residential condominium complex will include a 1.5-acre public park and a two-acre public park will be developed along Coles Street in a larger (5.5 acre) mixed-use development.

There are no parklands or publicly-accessible open spaces within the construction footprint of the proposed Project. The proposed Project would not require permanent or temporary acquisition of any publicly-owned parks and would not directly or indirectly result in significant adverse impacts to any of these parks. In addition, the proposed Project would not result in proximity impacts so severe that the activities, features, or attributes of these recreational resources would be substantially impaired. Therefore, the proposed Project would not constitute a Section 4(f) use of these properties and no further analysis is necessary.

20.6 ALTERNATIVES TO AVOID THE USE OF SECTION 4(F) PROPERTIES

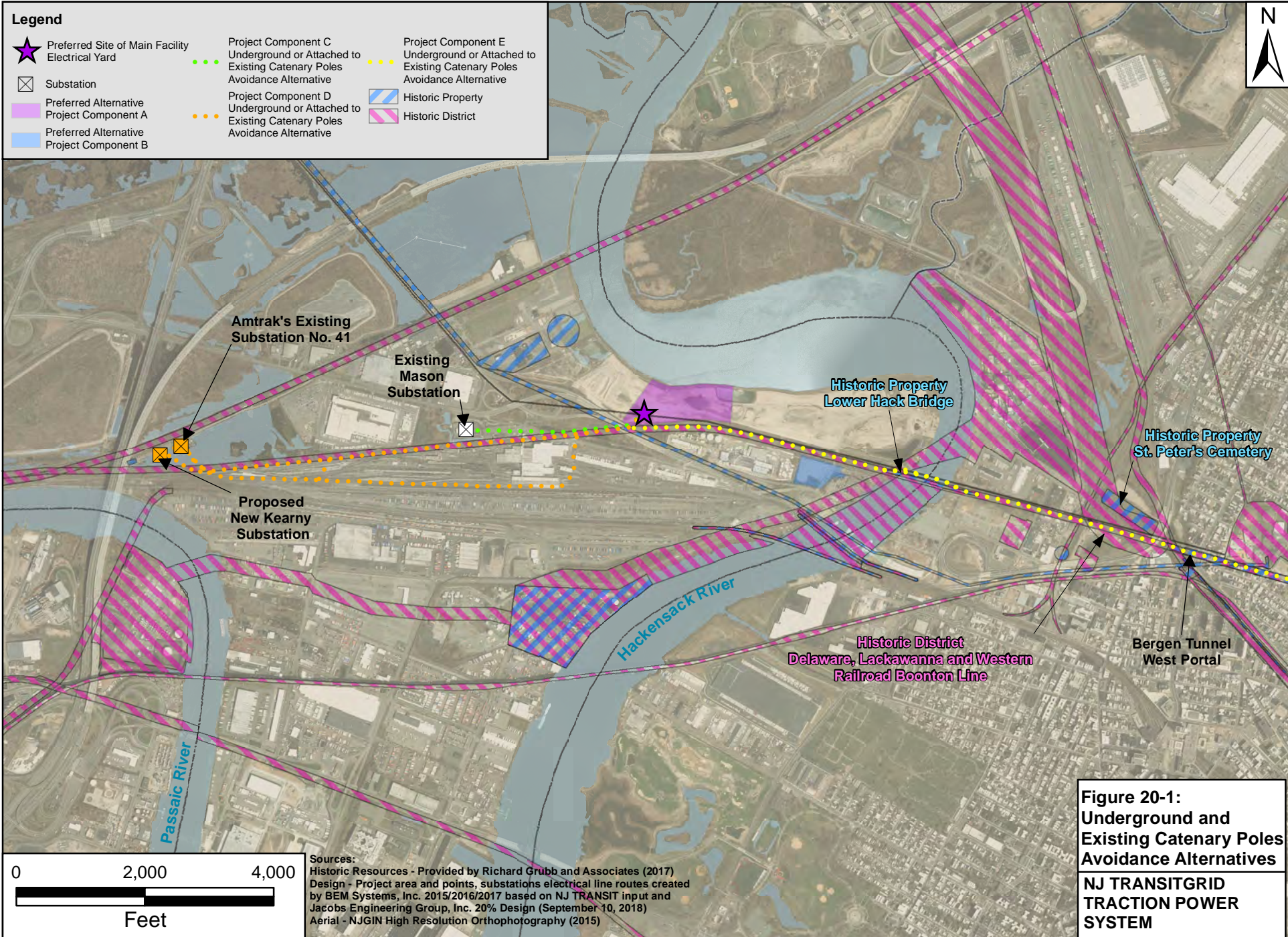
As discussed in Section 20.5.1, the Build Alternative would result in the Section 4(f) use of the Old Main DL&W Railroad Historic District. Therefore, an avoidance alternative analysis has been prepared, in accordance with 23 C.F.R. § 774.17 & 774.3(c) (2008). An “avoidance alternative” is an alternative that avoids use of all Section 4(f) properties. FTA and NJ TRANSIT identified four alternatives that would avoid the use of the Old Main DL&W Railroad Historic District—the No Action Alternative, the Underground Alternative, the Existing Catenary Poles Alternative, and the Relocated Monopoles Alternative.

20.6.1 No Action Alternative

Under the No Action Alternative, the microgrid would not be constructed and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. No element of the proposed Project would be implemented, and no monopoles would be installed. The context of the Old Main DL&W Railroad Historic District and its contributing resources would remain the same. Therefore, the No Action Alternative would avoid the Section 4(f) use of the Old Main DL&W Railroad Historic District. However, the No Action Alternative would not enhance the resiliency of the electricity supply to the NJ TRANSIT and Amtrak infrastructure, leaving critical public transportation and 143,000 daily commuters who depend on it vulnerable to service disruptions due to power outages during more frequent severe weather or potential man-made events. Although the No Action Alternative is feasible and would avoid the use of Section 4(f) properties, it would not meet the stated purpose and need of the proposed Project and would therefore not be prudent.

20.6.2 Underground Alternative for Avoidance to Section 4(f) Properties

With the Underground Alternative, no monopoles would be installed, and all electrical lines would be installed underground from the Bergen Tunnels’ western portals to Amtrak’s Substation No. 41 (see Figure 20-1). Installing the electrical lines entirely underground would eliminate the need for the above-ground monopoles. The lines would be physically located within the Old Main DL&W Railroad Historic District but would not be visible. The Underground Alternative would have a limited effect on the Old Main DL&W Railroad Historic District, and no effect on the Lower Hack Drawbridge and the Hackensack River Lift Bridges Historic District. Therefore, while the Underground Alternative would be constructed within the Old Main DL&W Railroad Historic District, it would not comprise a Section 4(f) use. The Underground Alternative would meet the purpose and need of the proposed Project, however, it presents several major engineering, geotechnical, and environmental challenges, as described below.



Safety & Stability Concerns

During early development of the Meadowlands, in order to stabilize the swampy lands, fill material (also referred to as “historic fill”) was used to raise the elevation for construction of railroads, roadways and buildings. This fill material consisted of various materials such as, but not limited to, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid waste. The Underground Alternative would require extensive trenching within the rail right-of-way to install the electrical lines. This trenching would have the potential to disturb the geological equilibrium of the existing track embankment and affect the short- and long-term stability of the railroad. The existing embankment is not composed of uniform fill material; rather, it includes boulders and cobbles that have settled over the years and stabilized. Excavating within or near the embankment causes engineering and geotechnical concerns, as such activities can cause destabilization. A standard requirement of NJ TRANSIT is to not allow work that has the potential to disturb the embankment due to the potential safety risks. Any work in close proximity to any embankment requires ongoing survey to confirm there is no displacement of the embankment which in turn would cause impact to rail alignments, resulting in possible derailment of trains. Track alignment is extremely sensitive to these types of displacements.

To avoid the potential for destabilizing the existing rail embankment, the Underground Alternative could alternatively be constructed at a farther distance from the embankment, which would, require extensive trenching outside of the rail right-of-way. This would result in substantial property acquisition and severe impacts to environmental resources protected under other Federal statutes along with socioeconomic and other associated impacts. This strategy is also unacceptable and would not be prudent.

Major Utility Conflicts

The proposed Project area contains an extraordinary number of existing underground utilities—including stormwater, sanitary sewer, city water, fiber optics and telecommunications lines, electric utility distribution lines, high pressure natural gas lines, as well as rail signal power and fiber optic control lines. The Underground Alternative would result in insurmountable utility conflicts due to the quantity of lines and conflicts that must be avoided or utilities that would require relocation, which would further expand the area of impact. Recent test pits have found that as-built documentations of area utilities are not accurate; obtaining reliable information would require an extensive and highly disruptive subsurface investigation of area utilities just to review options for underground routing in this extremely congested area. The Underground Alternative would require extensive trenching near some of the existing high-pressure gas and high voltage electric lines. Given the uncertainty regarding their precise location, such trenching would pose an unacceptable safety risk.

Conflict with Transportation Foundations

An additional challenge with the Underground Alternative stems from the transportation infrastructure foundations that are along the right-of-way, where the electric line would be installed. Major foundations include the Route 1 access ramp and the JFK Boulevard overpass. In addition, the tracks are elevated in some parts of the corridor and cross over public roadways, including Duffield Avenue, James Avenue, and Webster Avenue. To avoid the ramp and overpass foundations, the Underground Alternative electrical

line could not be installed in a straight linear trench but would instead need to meander underground to avoid the major transportation structure foundations. A meandering underground trench would be an unusual design for an electrical line and would result in a need for frequent underground manholes, again expanding the area of impact.

Unfavorable Geotechnical Conditions

Geotechnical conditions for trenching are not favorable along portions of the corridor due to various types of fill material used during construction of the railroad in the 1840s. The materials used to construct the embankment were mainly materials excavated for construction and construction debris from development in the surrounding areas. As the materials are varied in their make-up, settlement has occurred over the past 150-plus years at varying rates. Furthermore, extensive trenching near the embankments could result in encountering historic fill or other common railroad contaminants.

Construction Cost of an Extraordinary Magnitude

The Underground Alternative would substantially prolong the duration of construction and the associated environmental effects and result in costs of at least 10 times that of the Build Alternative.

Conclusion Regarding Feasibility and Prudence

Given the engineering, safety, and geotechnical concerns described above, the Underground Alternative cannot be built as a matter of sound engineering judgment; and is therefore not feasible. Furthermore, given the extensive property acquisition, environmental, socioeconomic, and cost impacts, the Underground Alternative would not be prudent. Therefore, FTA has determined that the Underground Alternative is not a feasible and prudent avoidance alternative.

20.6.3 Existing Catenary Poles Alternative for Avoidance to Section 4(f) Properties

With the Existing Catenary Poles Alternative, no new monopoles would be installed, and all electrical lines would be installed on existing catenary structures from the Bergen Tunnels' western portals to Amtrak's Substation No. 41 (see Figure 20-1). Installing the electrical lines entirely along existing catenary structures would eliminate the need for the new, tall above-ground monopoles. The electrical lines would be physically located within the Old Main DL&W Railroad Historic District but would be visually consistent with the existing infrastructure. The Existing Catenary Poles Alternative would have a limited effect on the Old Main DL&W Railroad Historic District and would not constitute a use of Section 4(f) properties. While the Existing Catenary Poles Alternative would meet the purpose and need of the proposed Project, it presents several major engineering challenges—specifically, structural concerns and clearance concerns.

The existing catenary poles were designed and constructed to bear the loads of the existing catenary wires and have specific weight ratings. The additional weight of the new electrical lines could not be accommodated by the existing aging structures. Furthermore, the catenary poles have limited space on their cross-arms; hanging multiple lines on the same cross-arm would place unacceptable stress on the arm attachment. From a structural engineering perspective, placing the new electrical lines on the existing catenary poles is not feasible. In addition to structural infeasibility, clearance requirements cannot be

met. A continuance distance is needed between multiple high voltage cables to prevent electrical arcing, and cables are hung with specified distances between rails between the rails and the train pantograph to avoid grounding and arcing.

Given the serious structural and electrical concerns, the Existing Catenary Poles Alternative would result in unacceptable safety and operational problems and cannot be built as a matter of sound engineering judgment. Therefore, FTA has determined that the Existing Catenary Poles Alternative is not a feasible and prudent avoidance alternative.

20.6.4 Relocated Monopoles Alternative for Avoidance to Section 4(f) Properties

With the Relocated Monopoles Alternative, the monopoles would be installed outside the Morris & Essex Line right-of-way for the segment extending from the Bergen Tunnels' western portals to Amtrak's Substation 41 (see Figure 20-2). The monopoles would be located far enough away from the Old Main DL&W Railroad Historic District to avoid direct adverse effects to the District. However, this alternative presents multiple concerns.

First, the Relocated Monopoles Alternative would be constructed outside the rail right-of-way, resulting in extraordinary property acquisition and severe socioeconomic and land use impacts associated with such acquisition. This would contradict the proposed Project's goals to minimize property acquisition.

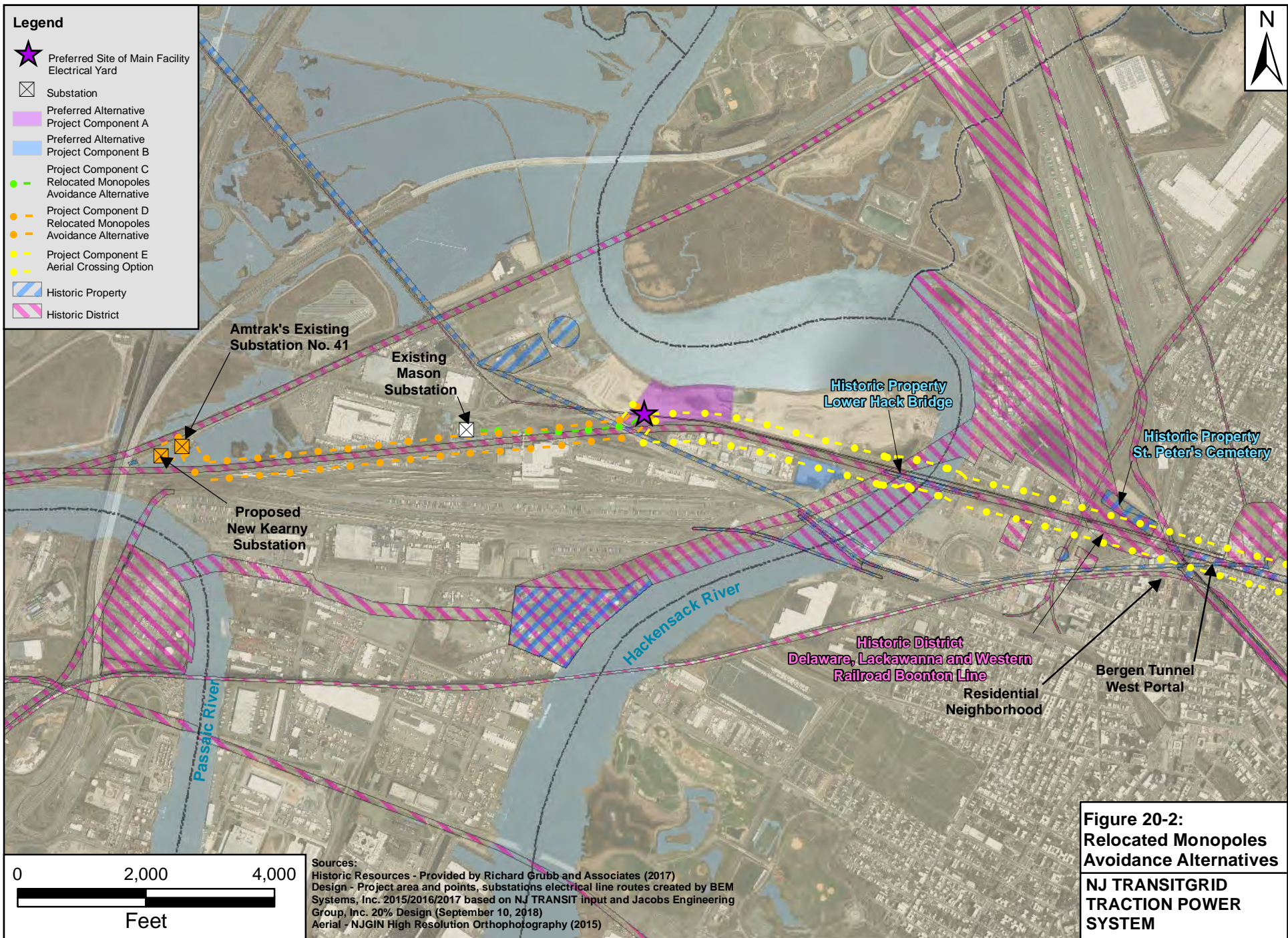
Second, the Relocated Monopoles Alternative would result in substantial impacts to environmental resources protected under Federal statutes, including wetlands and natural areas adjacent to the proposed Project area. East of the Hackensack River, the monopoles would need to be relocated to the north or south of the Old Main DL&W Railroad Historic District, likely impacting either the residential neighborhood to the south (resulting a potential environmental justice impact) or within St. Peter's Cemetery (resulting in a potential archaeological impact and Section 4(f) use).

Third, the Relocated Monopoles Alternative would still have the potential to result in a cumulative adverse visual impact to the Old Main DL&W Railroad Historic District. Monopoles with aerial wire connections ranging from 65 feet to 220 feet high would still be constructed under this avoidance alternative.

While the Relocated Monopoles Alternative would be feasible from an engineering perspective, it would not be prudent. After reasonable mitigation, this alternative would still cause severe social, economic, and environmental impacts; potentially severe disruption to established communities and disproportionate impacts to minority or low-income populations; and severe impacts to environmental resources protected under other Federal statutes.

20.6.5 Conclusion Regarding Avoidance Alternatives

As discussed above, the No Action Alternative, the Underground Alternative, the Existing Catenary Poles Alternative, and the Relocated Monopoles Alternative would all avoid the Section 4(f) use of the Old Main DL&W Railroad Historic District, but none would be both feasible and prudent.



The Build Alternative is the only feasible and prudent alternative and a least overall harm evaluation is therefore not required. The FTA and NJ TRANSIT will continue to work in partnership with the NJHPO and the Consulting Parties to develop measures to avoid, minimize and mitigate the effect of the proposed Project on historic resources, as discussed in Chapter 9, “Historic Resources.” These measures are outlined below and included in the draft Programmatic Agreement (PA).

20.7 MEASURES TO MINIMIZE HARM

As required by Section 106 of NHPA, FTA and NJ TRANSIT are participating in an ongoing consultation process with the NJHPO and Consulting Parties regarding the potential effects on historic resources. Through consultation, FTA and NJ TRANSIT have developed measures to minimize or mitigate the adverse effect on the properties protected under Section 4(f). The mitigation measures are set forth in the draft PA, to be executed by NJHPO, FTA, and NJ TRANSIT. The draft PA lists the historic resources that may be affected by the project and describes the measures to be implemented during the project’s design and construction, to avoid, minimize, or mitigate adverse effects of the project on historic resources.

Mitigation measures under consideration for historic aboveground resources include Historic American Engineering Record (HAER)-like recordation and a program of historic interpretive signs or kiosk of history display at a location to be agreed upon by NJ TRANSIT and the NJHPO. The display will comprehensively address the impact of railroads and railroading on the Meadowlands and the bridge crossings of the Hackensack River (and possibly the Passaic River). Direct impacts to historic resources would be avoided through careful design and placement of monopoles, duct banks, and other project elements. The design would be sensitive to the historic character of the Old Main DL&W Railroad Historic District and other resources. To minimize impacts to the historic fabric of the New Bergen Tunnel and the West Shore Railroad Tunnel, the electrical line installation will be designed in a careful and context-sensitive manner. For archaeological resources, monitoring during construction in certain areas sensitive for archaeological resources will be implemented, as recommended by NJHPO.

Currently, Preferred Alternative Project Component D is for the electrical line to depart from the Morris & Essex Line east of the Mason Substation and travel south around the MMC buildings and west along the MMC access rail toward Cedar Creek Marsh South. NJHPO has identified this route as their preferred option as it would result in a lesser impact to the Old Main DL&W Railroad Historic District. However, neither the preferred alternative or the optional route along the Morris & Essex right-of-way has been confirmed for construction. The required mitigation measures in the draft PA would take place for either of the route options. Although the Project has been thoroughly examined for impacts to potential historic and archeological resources, for unanticipated historic and prehistoric archeological resources encountered, the draft PA directs that the resources be treated in compliance with 36 CFR § Part 800.11 and CFR § Part 800.13. The implementation of these mitigation measures and context-sensitive design would constitute all possible planning to avoid, mitigate, or minimize harm from the proposed Project to the attributes and features of Old Main DL&W Railroad Historic District and its contributing resources that qualify these properties for protection under Section 4(f).

20.8 COORDINATION

The proposed Project has included extensive public and community outreach efforts. FTA and NJ TRANSIT have consulted with federal, state, and local agencies during the preparation of the environmental analyses. Agency coordination has occurred throughout the NEPA process and would continue during the design and construction phases of the proposed Project. A Technical Advisory Committee (TAC) was formed to facilitate effective and timely decision-making and an efficient environmental review process. The TAC includes project team members and Cooperating and Participating Agencies. In addition, a project website is being maintained to provide information on the project and upcoming milestones and meetings. The website is accessible through NJ TRANSIT's resilience website (<http://njtransitresilienceprogram.com/>).

A *Draft Scoping Document* was made available for public review. A Public Scoping Meeting was held on February 3, 2016 at St. Peter's University in Jersey City, NJ. Availability of the scoping document and notice of the meeting were advertised in the Federal Register on January 7, 2016, and in English- and Spanish-language newspapers, and notices were posted at 11 public libraries and 17 Section 8 housing complexes. In addition, e-blast notifications were sent to stakeholders and web subscribers.

Several stakeholders expressed written support for the proposed Project. One stakeholder, the Town of Kearny, opposes the location of the proposed Project in Kearny, NJ. The Kearny Town Council adopted Resolution 2016-68 on January 26, 2016 to formally oppose the location of the Main Facility within Kearny city limits. The Resolution (see Appendix H, "Public Involvement") identified concerns related to adverse environmental, economic and social impacts as the basis for the opposition. A *Final Scoping Document*, which summarizes the comments received during public scoping and responses to those comments, was posted to the Project web page in May 2016 (<http://njtransitresilienceprogram.com/>). Notice of its availability was widely distributed.

FTA and NJ TRANSIT have consulted with the NJHPO and Consulting Parties pursuant to Section 106 consultation requirements. FTA and NJ TRANSIT consulted with the NJHPO on the definition of the APE as well as the identification of consulting and interested parties. Agencies and individuals with an identified interest in history or historic preservation were contacted as part of this work. Information was requested regarding opinions as to the significance of properties within the APE, project compatibility/incompatibility with existing historic resources, project effect(s) on eligible resources, and other thoughts and concerns relevant to the review process for the project. The NJHPO concurred with the list of Consulting Parties for the project, which includes the Hoboken Historic Preservation Commission, Jersey City Historic Preservation Commission, and the Town of Kearny. The Bayonne Historic Preservation Commission, the Mayors of Union City and North Bergen, and the Weehawken Historical Commission were invited as additional consulting parties. The Union City Museum of History was invited as an additional interested party. As part of the Section 106 consultation process, FTA contacted the following tribes/offices: the Delaware Tribe Historic Preservation Office; Tribal Historic Preservation Officer, Delaware Nation; Tribal Historic Preservation Officer, Eastern Shawnee Tribe of Oklahoma; Tribal Historic Preservation Officer, Shawnee Tribe of Oklahoma.

On October 19, 2016, RGA received a response from James P. Bruno, Esq., attorney for the Town of Kearny, stating that Kearny would like to be a consulting party for the purposes of Section 106 review and that Mr. Bruno would act as the designated representative for the Town. On November 4, 2016, FTA received a response from Susan Bachor, Historic Preservation Representative for the Delaware Tribe, stating that the Tribe wishes to enter consultation, as the APE is within an area of high probability for buried historic resources of significance to the Tribe. No other responses have been received to date.

Comments from consulting parties were provided to NJ TRANSIT and FTA for consideration. Consultation comments provided by the NJHPO on April 24, 2018 were forwarded to consulting parties. Consultation with the NJHPO involved submission of the HARBS/EA as well as the Phase IA Archaeological Survey on June 16, 2017; both documents included identification of historic properties, effects assessments, and measures to minimize harm to historic properties. Supplemental information to the HARBS/EA and Phase 1A were provided to the NJHPO on January 26, 2018. FTA and NJ TRANSIT have held multiple coordination meetings with NJHPO.

Through the Section 106 consultation process, the NJHPO determined that the proposed Project would result in an adverse effect to the Lower Hack Draw Bridge and Hackensack River Lift Bridges Historic District, and to the Old Main DL&W Railroad Historic District. Measures to avoid, minimize, and mitigate harm to these resources are summarized above and included in the stipulations of the draft PA, and would be implemented in the design and construction of the proposed Project. FTA considered the views of all Consulting Parties throughout the Section 106 process. FTA and NJ TRANSIT will continue to consult with the NJHPO to execute the PA and will implement measures that reflect all possible planning to minimize harm from the use of the Old Main DL&W Railroad Historic District, as a Section 4(f) property.

Chapter 21 Agency Coordination and Public Participation

21.1 INTRODUCTION

This chapter describes the agency coordination and public participation process that is being conducted for the proposed Project. A list of anticipated permits and approvals required for the project and a summary of meetings held to date are provided.

21.2 AGENCY COORDINATION

As discussed in this DEIS, FTA and NJ TRANSIT have consulted with federal, state, and local agencies during the preparation of the environmental analyses. Agency coordination has occurred throughout the NEPA process and would continue during the design and construction phases, particularly with the agencies that have regulatory jurisdiction and permitting authority.

In accordance with the federal CEQ regulations (40 CFR § 1508.5 [2014]), “Cooperating Agency” means any federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. “Participating Agencies” are those federal, state, or local agencies or federally recognized tribal governmental organizations with an interest in the project. A Technical Advisory Committee (TAC) was formed to facilitate effective and timely decision-making and an efficient environmental review process. The TAC includes project team members and Cooperating and Participating Agencies.

Permits and approvals that are anticipated to be required for the operation and construction of the Build Alternative are described below. In addition to these permits, FTA and NJ TRANSIT are coordinating with several agencies regarding processes that have been integrated with NEPA (e.g., Section 106 of the National Historic Preservation Act [NHPA]), Section 7 of the Endangered Species Act [ESA], etc.).

Appendix C “Historic Resources” contains all Section 106 consultation and NJHPO correspondence. Other interagency correspondence is provided in Appendix D, “Agency Coordination.” These interagency correspondences are summarized below.

United States Fish and Wildlife Service (USFWS) Information Planning and Coordination (IPaC) Report – After submitting an online IPaC report request, USFWS responded on April 3, 2017 and reported their findings on December 19, 2018. Their determination was that there was no listed species or critical habitats that lie within the vicinity of the proposed Project.

New Jersey Department of Environmental Protection (NJDEP) Natural Heritage Program (NHP) Request letter – A Request letter was submitted on February 22, 2016 to the NJDEP NHP and a response letter was received on March 8, 2016. Their determination was as follows: there is one rare plant species covered by the Flood Hazard Area Control Act (FHACA) Rules within one mile of the proposed Project area. The

wafer-ash (*Ptelea trifoliata* var. *trifoliata*) is a state protected vascular plant. There are fourteen species of special concern (Rank 2 and 3) within one mile of the proposed Project area. There are three state threatened species (Rank 4) within the one-mile area of the proposed Project area. There is one federally protected species within one mile of the Project site. The Shortnose sturgeon (*Acipenser brevirostrum*) is Federally Listed Endangered and State Endangered species with a migratory corridor in the Hudson River.

United States Army Corp of Engineers (USACE) Section 404 Request – On March 23, 2016, the FTA submitted a request for concurrence from the USACE for the proposed milestone schedule for the Clean Water Act Section 404 permit for the proposed Project.

National Marine Fisheries (NMFS) Request Letter – Original request letter submitted July 19, 2016 with a response received August 4, 2016. Follow-up request sent March 29, 2017, with a response received March 31, 2017. Consultation remained the same. No federally listed or proposed threatened or endangered species under their jurisdiction are known to exist in or on the site of the proposed project. The project has areas that are designated as Essential Fish Habitat (EFH) for certain species and would require an EFH Assessment. An EFH Confirmation Letter was sent April 4, 2017. A response was received on February 23, 2018 stating that an EFH Assessment was no longer necessary based on revisions to regulations.

Federal Aviation Administration (FAA) – An invitation to comment on/participate in the Project’s environmental review process (this DEIS) was sent to FAA on September 28, 2018. Initial review and correspondence provided on November 23 and November 26, 2018 resulted in FAA declining to participate in the TAC review process. FAA did request that the project proponent (NJ TRANSIT) complete FAA’s online Notice Criteria Tool prior to commencement of construction since the proposed Project is in the vicinity of Newark Liberty International Airport.

NJDEP Tidelands Review – A tidelands instrument review request was submitted to Signature Information Solutions, LLC. on February 24, 2017, November 5, 2017 and February 8, 2018. The responses show the Tideland claims on the parcels of the proposed Project area.

NJDEP NEPA Notice of Intent to Prepare a Draft EIS Letter – On February 24, 2016, NJDEP Office of Permit Coordination and Environmental Review sent a letter with comments on the *NEPA Notice of Intent to Prepare a Draft EIS* and *Draft Scoping Document*.

NJDEP Green Acres Jurisdictional Determination – Based on comments provided by the NJDEP in February 2016 to the *NEPA Notice of Intent to Prepare a Draft EIS* and *Draft Scoping Document*, a letter was submitted to the NJDEP Green Acres Program on July 19, 2016. It was determined that none of the proposed Project parcels are Green Acres encumbered. A follow-up letter was sent to the NJDEP Green Acres Program on March 28, 2017. On November 10, 2017, an email was sent to NJDEP Green Acres inquiring about the follow-up letter sent in March. NJDEP Green Acres responded on November 22, 2017, stating that 3 properties were encumbered by the Green Acres Program. After further review by NJ TRANSIT, no construction was to occur within NJDEP Green Acres encumbered properties and a reply notification was sent on December 1, 2017. NJDEP Green Acres accepted the notification and it has been deemed that this project will not impact properties encumbered by NJDEP Green Acres.

21.2.1 Technical Advisory Committee (TAC) Coordination

The roles and responsibilities of the federal, state and local agencies that are Cooperating and Participating Agencies in the NEPA process are described in Table 21-1 and a summary of the TAC coordination that has or will occur during the DEIS and FEIS/ROD is provided in Table 21-2. TAC coordination completed to date includes the initial project introduction and NEPA overview meeting which was held on October 29, 2015; the preliminary *Draft Scoping Document* review, which occurred in December 2015 and January 2016; a virtual meeting reviewing the proposed Project and development process on June 22, 2016; the preliminary DEIS review, which occurred in February and March 2019 and a virtual meeting reviewing the proposed Project and environmental analysis which was held on March 5, 2019. Several agencies provided comments on the preliminary *Draft Scoping Document* and those comments and responses are included as an attachment to the *Final Scoping Document* available at <http://njtransitresilienceprogram.com/documents/>. One agency provided comments on the preliminary DEIS, those comments are included in Appendix D, "Agency Correspondence." Beyond their involvement in the TAC as a Participating Stakeholder, Amtrak has been involved in discussions with NJ TRANSIT related to the design of the replacement of Substation No. 41 with the new Kearny Substation.

21.2.2 Permits and Approvals

The environmental permits and regulatory approvals anticipated to be required to construct and operate the proposed Project are described below.

Federal

- USACE Jurisdictional Determination (JD), which is required to determine the presence or absence of wetlands in the Project area;
- USACE Section 404 Individual Permit, which is required for the discharge of dredged or fill materials into a surface water of the United States; and
- Compensatory Mitigation, required for the placement of fill in waters of the U.S., and required taking of inland freshwater resources.
- FAA review of Obstruction Evaluation through submittal of online Notice Criteria Tool for proposed obstacles off airport property.

State

- Title V, Nonattainment New Source Review/Emissions Offset and Prevention of Significant Deterioration permit, which is required to comply with the Clean Air Act (CAA). This is a federal requirement, which is administered through NJDEP;
- NJDEP Flood Hazard Area (FHA) Individual Permit and FHA Verification, which is required for excavation or filling in regulated flood hazard areas, and riparian zones;

- NJDEP Waterfront Development Upland and In-Water Individual Permit, which is required for activities within the NJDEP regulated Waterfront Development Zone and activities above the mean high water line of a surface water;
- NJDEP Freshwater Wetland General Permit No. 2: Underground Utility Lines for the installation of the natural gas pipeline;
- NJDEP New Jersey Pollutant Discharge Elimination System (NJPDES) Surface Water General Permit, which are issued limiting the mass and/or concentration of pollutants which may be discharged into groundwater, streams, rivers, and the ocean;
- NJ Department of Transportation (NJDOT) access permit for connection to Route 7 (if required);
- NJ Sports and Exposition Authority (NJSEA)/Meadowlands Regional Commission (MRC) coordination on Redevelopment Plan Zoning Certification requirements; and
- NJDEP Site Remediation Program coordination for Pre-Construction Investigation Work Plan approval.

Local

- Hudson Essex Passaic Soil Conservation District (HEPSCD) Soil Erosion and Sediment Control (SESC) Certification, which is required for land disturbance above a specified threshold; and
- Sanitary sewer and water main extension permits.
- Sewer Use Permit

Table 21-1 Cooperating and Participating Agencies

Agency	Role	Responsibilities
US Environmental Protection Agency (EPA)	Cooperating Agency	Compliance with Clean Air and Water Acts, remedial activities/brownfields (permits administered through NJDEP)
US Army Corps of Engineers (USACE)	Cooperating Agency	New Jersey Meadowlands District wetlands jurisdiction
US Department of Energy (DOE)	Participating Agency	Interest in advancing energy technologies, expertise in NEPA documentation for energy projects
US Department of Transportation (DOT), Federal Railroad Administration (FRA), Region 1	Participating Agency	Northeast Corridor jurisdiction
Federal Emergency Management Agency (FEMA), Region 2	Participating Agency	General interest
US Department of Housing and Urban Development (HUD), Regions 1 and 2	Participating Agency	General interest
US Federal Aviation Administration (FAA)	Participating Agency	Regulatory oversight for lighting requirements for stacks and monopoles.
Amtrak	Participating Stakeholder	Owns and operates on Northeast Corridor, project elements include modification to Amtrak infrastructure
NJ Department of Environmental Protection (NJDEP)	Participating Agency	Land use, Coastal/Waterfront Redevelopment, Freshwater Wetlands, Flood Hazard Area, NJPDES/Stormwater management permits, Air Resources (Title V, et al), Construction Plan approval, as required
NJ Board of Public Utilities (NJBPU)	Participating Agency	Regulatory oversight and expertise in interconnection agreements with PSE&G
NJ Department of Transportation (NJDOT)	Participating Agency	General interest
NJ Office of Emergency Management (NJOEM)	Participating Agency	Interest in secure facility
NJ Office of Homeland Security and Preparedness (NJOHSP)	Participating Agency	Interest in secure facility
Meadowlands Regional Commission	Participating Agency	Koppers Coke Peninsula Redevelopment Plan (February 2013) encompasses the project site
Hudson County Improvement Authority (HCIA)	Participating Agency	Current owner of project site for Main Facility and Natural Gas Pipeline connection parcels
Hudson County Planning	Participating Agency	Facility to be located in Hudson County
Hudson Essex Passaic Soil Conservation District (HEPSCD)	Participating Agency	Permit approval

Table 21-2 Technical Advisory Committee Coordination

TAC Meeting Topic	Approximate Timeframe	Coordination Activity	Notes
1. Project Briefing	Fall 2015	Review Project concept and agency coordination objectives	Project overview and proposed Project NEPA schedule presented to meeting attendees.
2. Public Scoping	Winter 2015/2016	Review/revision of scoping materials prior to public meeting	Draft Scoping Document provided to TAC members for review prior to public review period and public meeting. Comments provided by TAC members incorporated, as appropriate. Final Scoping Document published May 2016.
3. Alternatives	Spring 2016	Review alternative technologies and siting study	Proposed Project progress and alternative siting analysis presented to meeting attendees.
4. Preliminary DEIS	Winter 2019	Review/revision of document prior to publication	Preliminary DEIS provided to TAC members for review prior to public review period and public hearing. Comments provided by TAC members incorporated, as appropriate, into DEIS.
5. FEIS/ROD	Fall 2019	Review/revisions of DEIS comments and responses and ROD	

21.3 PUBLIC PARTICIPATION

The public involvement process includes tools and activities for public outreach and engagement, for the purposes of satisfying the public outreach requirements of NEPA and other applicable regulations and to provide information to interested individuals beyond the regulatory requirements. The tools and deliverables to facilitate this program include, but are not limited to, the following project tasks.

21.3.1 Database

A Project outreach database (i.e., mailing list) has been developed and will be maintained throughout the duration of the project. The database includes information on all project stakeholders (elected officials, community groups, local businesses, public agencies, affiliated team members, and other interested parties). All issues, correspondence, and feedback received through the NEPA process will be tracked and recorded. The NJ TRANSITGRID database was and is continuing to be developed through comments logged at public meetings or sent via the NJ TRANSITGRID Resilience Project website. Additionally, people are added through sign-up sheets at public meetings or via the sign-up form on the website.

21.3.2 Fact Sheets

Project fact sheets are issued as an effective way to keep interested parties informed about project developments and key milestones. Fact sheets are made available in both English and Spanish, and available in printed form for distribution at meetings. Fact sheets are issued on an as needed basis and posted to the NJ TRANSIT's resilience website and/or in email blasts in electronic form (PDF).

21.3.3 Website

A Project website is being maintained to provide information on the Project and upcoming milestones or meetings. It also provides feature postings on Project benefits and goals, a calendar of upcoming events, informational video and environmental documentation. The website is accessible through NJ TRANSIT's resilience website (<http://njtransitresilienceprogram.com/>).

21.3.4 Targeted Meetings and Outreach

Targeted meetings with key stakeholders with an interest in the project are held as needed to identify and address questions and concerns and obtain feedback.

A public scoping meeting was held on February 3, 2016 to provide further information on the proposed Project, solicit input from the public on the DEIS analysis, and respond to concerns and comments expressed by members of the local community. Public notification was done by distributing a notification to those who subscribed to the email distribution list via the NJ TRANSIT Resilience Program website, and via fliers, all of which were provided in English and Spanish and were distributed to public libraries and local Section 8 housing developments. The fact sheets are included in Appendix G, "Public Involvement."

The public scoping meeting was held at Saint Peter's University from 4pm EST to 8pm EST, where a presentation of the Project started at 6pm EST. The presentation, included in Appendix G, provided a Project description, the purpose and need, the NEPA review process, and the Scoping process. Approximately eight people from the general public attended. One comment was received during the meeting and is provided in Appendix G.

21.3.5 Environmental Justice Outreach

The environmental justice process requires federal agencies to evaluate and avoid, minimize, and mitigate disproportionately high and adverse human health and environmental impacts to environmental justice communities resulting from federal actions. It also requires federal agencies to ensure public participation by communities with substantial minority or low-income populations who may be affected by a project. The study area includes environmental justice communities, so outreach efforts are targeted to reach these communities. Minority and low-income populations within a two-mile radius around the Main Facility site and in areas adjacent to the transmission line routes and substation improvements were identified in order to target outreach to Environmental Communities. Outreach materials were provided

in English and Spanish, as well as other languages if requested or deemed necessary, based on interest in the Project. Provisions for translation services at the public scoping meeting were made available.

Outreach efforts included posting fliers at the listed Section 8 housing developments:

- Montgomery Gardens, 563 Montgomery Street, Jersey City, NJ 07302
- Booker T. Washington, 200 Colden Street, Bldg. #2, Jersey City, NJ 07302
- Thomas J. Stewart, 88-92 Erie Street, Jersey City, NJ 07302
- Barbara Place Terrace, 471 Pacific Avenue, Jersey City, NJ 07304
- Glennview Townhouses I, 463 Pacific Avenue, Jersey City, NJ 07304
- Lafayette Senior Living Center, 463 Pacific Avenue, Jersey City, NJ 07304
- Lafayette Village, 579 Grand Street, Jersey City, NJ 07304
- Pacific Court, 148 Bramhall Avenue, Jersey City, NJ 07304
- Woodward Terrace, 148 Bramhall Avenue, Jersey City, NJ 07304
- Berry Gardens, 199 Ocean Avenue, Jersey City, NJ 07305
- Curries Woods, 3 New Heckman Drive, Jersey City, NJ 07305
- Dwight Street Homes, 315 Randolph Avenue, Jersey City, NJ 07305
- Hudson Gardens, 27-29 Palisade Avenue, Jersey City, NJ 07305
- Ocean Pointe East and West, 460 Ocean Avenue, Jersey City, NJ 07305
- Gloria Robinson Court Homes, 348 Duncan Avenue, Jersey City, NJ 07306
- Marion Gardens, 57 Dales Avenue, Jersey City, NJ 07306
- Holland Gardens, 241 Sixteenth Street, Jersey City, NJ 07310

21.4 PUBLIC SCOPING

Public Scoping initiated the NEPA process. A *Draft Scoping Document* was made available for public review on January 7, 2016 on the Project web page (<http://njtransitresilienceprogram.com/>). A Public Scoping Meeting was held on February 3, 2016 at St. Peter's University in Jersey City, NJ. Availability of the scoping document and notice of the meeting were advertised in the Federal Register on January 7, 2016, and in English- and Spanish-language newspapers, and notices were posted at 11 public libraries and 17 Section 8 housing complexes. In addition, e-blast notifications were sent to stakeholders and web subscribers. At the Public Scoping Meeting a project fact sheet was available and a short presentation was given that described the NEPA process and provided a description of the Project including the purpose and need. Copies of the *Draft Scoping Document* were provided at the Public Scoping meeting. A video loop of the

presentation was available and is posted on the Project web page. Comment forms in English and Spanish as well as services of a stenographer and laptop computer with access to the Project web page were provided during the meeting for the attendees to submit comments. The presentation provided the Project web page and NJ TRANSIT Resilience Department address for the public to submit questions outside of the Public Scoping meeting.

One written comment was provided during the Public Scoping meeting. A Bayonne resident that regularly uses NJ TRANSIT, provided his support for the Project. The comment expressed the Bayonne resident's belief the Project would benefit local residents and NJ TRANSIT riders by providing both improved reliability and safety.

Several stakeholders expressed written support for the proposed Project. One stakeholder, the Town of Kearny, opposes the location of the proposed Project in Kearny, NJ. The Kearny Town Council adopted Resolution 2016-68 on January 26, 2016 to formally oppose the location of the Main Facility within Kearny city limits. The Resolution (see Appendix G, "Public Involvement") identified concerns related to adverse environmental, economic and social impacts as the basis for the opposition. A *Final Scoping Document*, which summarizes the comments received during public scoping and responses to those comments, was posted to the Project web page in May 2016 (<http://njtransitresilienceprogram.com/>). Notice of its availability was widely distributed.

22.1 INTRODUCTION

NEPA legislation requires that an EIS describe “any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.” NEPA legislation also requires that the EIS describe “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity...” (42 U.S.C. § 433 (C)(iv)).

This chapter focuses on those two concepts and describes commitments for the No Action and Build Alternative:

- the permanent commitment of resources as compared to the benefits of the proposed Project; and
- the relationship between expending environmental resources in the short-term and gaining productivity in the long-term.

22.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The No Action Alternative, by definition, would not irreversibly or irretrievably commit resources. However, it would require a greater commitment of resources in the future due to its failure to improve the reliability of public transportation services during emergencies and produce electricity more efficiently than the commercial power grid.

Resources that may be irreversibly and irretrievably committed to the proposed Project include construction materials, energy, labor, funds, and land. These resources are not limited in supply; however, their use would not have an adverse impact on their continued availability for other projects. Natural gas, fuel, and non-recyclable materials used in construction and operation would represent irretrievable commitments of non-renewable resources that would not be available for use in other projects. The Build Alternative would consume approximately 10.38 million British Thermal Units (MMBtus) of natural gas annually (5 turbines operating at 237 MMBtus/hour for 8,760 hours per year). The total commitment of funds required for construction of the proposed Project is approximately \$546,353,085 million²³. Labor expenditures would be consistent with governmental incentives to spur growth. The proposed Project would require a relatively small commitment of land (approximately 26 acres); the Main Facility (Preferred Alternative Project Component A) and natural gas pipeline

²³ Note that the DISTRIBUTED GENERATIONS SOLUTIONS project is also included in the overall project funding of \$546 million. This project is being reviewed separately under NEPA as discussed in Chapter 1, “Purpose and Need.”

connection (Preferred Alternative Project Component B) would be built on a brownfield site within a Redevelopment Area, which would support local land use objectives.

22.3 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The No Action Alternative would not require construction and thus would not result in any short-term impacts, either adverse or beneficial, or changes in long-term productivity.

Construction of the Build Alternative would cause relatively minor construction-period impacts and, at the same time, create jobs and related economic benefits during construction. The proposed Project is consistent with state and national energy goals, which encourage investment in microgrids to meet the long-term diversified and resilient energy demands. Investment in the proposed Project now would forestall future declines in productivity that would otherwise result from a lack of investment in the regional transportation system.

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