NJ TRANSITGRID TRACTION POWER SYSTEM

Draft Environmental Impact Statement

PREPARED BY:
FEDERAL TRANSIT ADMINISTRATION
and NEW JERSEY TRANSIT CORPORATION

May 2019

DEIS Main Report

NJ TRANSIT
The Way To Go.

NJ TRANSITGRID TRACTION POWER SYSTEM

Draft Environmental Impact Statement
And Draft Section 4(f) Evaluation

Prepared by:
Federal Transit Administration
and
NJ TRANSIT

With Cooperating Agencies:
U.S. Environmental Protection Agency
U.S. Army Corps of Engineers

Participating Agencies:
U.S. Department of Energy, Federal Railroad Administration, Federal Emergency Management Agency, U.S. Department of Housing and Urban Development, Amtrak, N.J. Department of Environmental Protection, N.J. Board of Public Utilities, N.J. Department of Transportation, N.J. Office of Emergency Management, N.J. Office of Homeland Security and Preparedness, N.J. Sports and Exposition Authority, Hudson County Improvement Authority, Hudson County Planning, and Hudson County Soil Conservation District.

Pursuant to:
National Environmental Policy Act (42 U.S.C. § 4321 et seq.), and implementing regulations (40 CFR Part 1500 et seq.); FTA Environmental Impact and Related Procedures (23 CFR Part 771); National Historic Preservation Act (54 U.S.C. § 306101 et seq.) and implementing regulations (36 CFR Part 800); Clean Air Act as amended (42 U.S.C. § 7401 et seq.) and implementing regulations (40 CFR Parts 51 and 93); the Endangered Species Act of 1973 (16 U.S.C. § 1531 et seq.) and implementing regulations (50 CFR Part 402); Clean Water Act (33 U.S.C. § 1251 et seq.) and implementing regulations (33 CFR Part 320 et seq. and 40 CFR Part 230); Rivers and Harbors Act of 1899 (33 U.S.C. § 403); Coastal Zone Management Act (16 U.S.C. § 1451 to 1465); Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668(c)); Endangered Species Act (16 U.S.C. § 1531 to 1544); Fish and Wildlife Coordination Act (16 U.S.C. § 661-667(e)); Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 to 1891(d)); Migratory Bird Treaty Act (16 U.S.C. § 703-712); Pollutions and Harbors Act (16 U.S.C. § 1451 to 1465); Site Remediation Reform Act (N.J.S.A. 58:10C-1 et seq. [2013]); Resource Conservation and Recovery Act (42 U.S.C. § 321 et seq.); Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §9601 et seq.); U.S. Department of Transportation, "Section 4(f) of the Act of 1966" (49 U.S.C. §303 [1966]; 23 CFR §774 [1966]); FEMA 1977 - Executive Order 11990, *Protection of Wetlands*; US Department of Transportation 1979 - Executive Order 5650.2, *Flood Plain Management and Protection*; Construction and Operation of Public Parks and Recreational Facilities in Water Resource Development Projects (16 U.S.C. § 460); Preservation of Parklands (23 U.S.C. § 138); Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites (49 U.S.C. § 303); National Primary and Secondary Ambient Air Quality Standards (40 CFR 50); and Limitations on Certain Federal Assistance (42 U.S.C. § 7506), and other applicable federal laws.

The New Jersey Transit Corporation proposes construction of a 104 to 140 megawatts (MW) natural gas powered electric generation plant in Kearny, Hudson County, New Jersey and new electric power transmission lines, substations and other equipment to distribute the power to segments of New Jersey Transit and Amtrak passenger rail lines in northeast New Jersey. The electrical transmission lines would be located in Kearny, Jersey City, Hoboken, Bayonne, Weehawken, Union City, and North Bergen, New Jersey; specifically, within or adjacent to the existing Morris & Essex Rail Line between Newark, NJ and Hoboken Rail Yard; the Hudson Bergen Light Rail Line.

Pursuant to 49 U.S.C. 304a(b) [and 23 U.S.C. 139(n)(2)], FTA will issue a single document that consists of the Final Environmental Impact Statement (EIS) and Record of Decision (ROD) unless FTA determines that the statutory criteria or practicability considerations as defined in U.S. Department of Transportation "Guidance on the Use of Combined Final Environmental Impact Statements/Records of Decision and Errata Sheets in National Environmental Policy Act Reviews" (April, 25, 2019) preclude issuance of a combined document.

Donovan Vincent

for Stephen Goodman
Regional Administrator, Region 2
Federal Transit Administration
One Bowling Green, Room 429,
New York, NY 10004

5/8/19
Date of Approval

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5/8/19
Date of Approval

Abstract

New Jersey Transit Corporation (NJ TRANSIT) proposes to design and construct the NJ TRANSITGRID TRACTION POWER SYSTEM (proposed Project), a first-of-its-kind microgrid designed to provide highly reliable power to support limited service in a core segment of NJ TRANSIT's and Amtrak's critical service territory. As defined by the U.S. Department of Energy (DOE), a microgrid is a local energy grid with control capability, which means it can disconnect from the traditional grid and operate autonomously.

The Federal Transit Administration (FTA) selected the NJ TRANSITGRID TRACTION POWER SYSTEM as one element of the "NJ TRANSITGRID" project, a Public Transportation Resilience Project in response to Superstorm Sandy. FTA's selection of the proposed Project makes it potentially eligible for funds made available under the Disaster Relief Appropriations Act of 2013 (Pub. L. 113-2). FTA's selection of the NJ TRANSITGRID project was published in Federal Register Notice Vol. 79, No. 214, 65762-65765 on Wednesday, November 5, 2014 (Table 1, Funding ID D2013-RESL-009 "NJ TRANSITGRID").

The proposed "NJ TRANSITGRID" Project selected by FTA consists of two elements.

1. NJ TRANSITGRID TRACTION POWER SYSTEM - The proposed Project would include a natural gas-fired electric power generating plant (referred to as the Main Facility), and the electrical lines, substations and other emergency generators to distribute the power to required areas. The Main Facility would utilize combined-cycle technology resulting in power generation capacity of 104 to 140 megawatts (MW). The preferred site for the Main Facility is in Kearny, Hudson County, New Jersey. The electrical lines would be located in Kearny, Jersey City, Hoboken, Bayonne, Weehawken, Union City, and North Bergen, New Jersey; specifically, within or adjacent to the existing Morris & Essex Rail Line between Newark, NJ and Hoboken Rail Yard; and the Hudson Bergen Light Rail Line.
2. NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS would provide power to certain train stations, bus garages and other transportation infrastructure in northeastern New Jersey.

As the administer of potential federal funds, FTA is the designated federal lead agency responsible for implementing the National Environmental Policy Act of 1970 (NEPA) pursuant to NEPA implementing regulations 40 CFR Part 1500-1508 and USDOT implementing regulations 23 CFR 771. Owing to the proposed NJ TRANSITGRID TRACTION POWER SYSTEM potential for significant environmental impacts, FTA has directed the preparation of this draft environmental impact statement (DEIS) for that element in accordance with 23 CFR 771.123.

The NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS project elements would be constructed to function independently from the NJ TRANSITGRID TRACTION POWER SYSTEM project and provide independent utility with regard to mass transit resilience. Therefore, FTA determined that the NJ TRANSIT GRID DISTRIBUTED GENERATION SOLUTIONS elements would undergo separate environmental review pursuant to 23 CFR 771 and are not included in the DEIS.

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. The region's public transportation infrastructure is vulnerable to power outages due to the nature of the existing centralized power distribution system and the intensity and frequency of severe weather events. The microgrid would be capable of providing energy to portions of Amtrak's Northeast Corridor, NJ TRANSIT's Morris & Essex Line, and NJ TRANSIT's HBLR system during power outages. The microgrid would generate power 24 hours per day/7 seven days per week.

This DEIS has been prepared in accordance with the requirements of the NEPA of 1969 (42 U.S.C. 4332 § 1969), Section 106 of 23 CFR Part 771.123, and Section 4(f) of 49 U.S.C. 303. The Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) are cooperating agencies for this DEIS.

Pursuant to 49 U.S.C. 304a(b) [and 23 U.S.C. 139(n)(2)], FTA will use Errata Sheets to complete the DEIS and issue a single document that consists of the Final Environmental Impact Statement (EIS) and Record of Decision (ROD) unless FTA determines that the statutory criteria or practicability considerations as defined in U.S. Department of Transportation "Guidance on the Use of Combined Final Environmental Impact Statements/Records of Decision and Errata Sheets in National Environmental Policy Act Reviews" (April, 25, 2019) preclude issuance of a combined document.

This DEIS is being made available so that agencies and the public can review and comment on the proposed Project and its potential impacts. A Notice of Availability on the DEIS is available through the Federal Register at https://www.federalregister.gov/.

DEIS PUBLIC COMMENT DATES: The Draft EIS is available for a 60-day public review period from May 20, 2019 through July 19, 2019, pursuant to NEPA. Written comments sent to NJ TRANSIT will be accepted until the close of business on July 19, 2019.

DEIS AVAILABILITY This DEIS is available for agency and public review and comment on the proposed Project and its potential impacts from the project website: http://njtransitresilienceprogram.com/nj-transitgrid-overview/njtransitgriddocuments/

A hardcopy is also available for review at the Federal Transit Administration Region 2 Office, 1 Bowling Green Room 429, New York, NY, 10004 and at NJ TRANSIT Headquarters, One Penn Plaza East, Newark, NJ 07105.

DEIS PUBLIC HEARINGS: Two public hearings providing an opportunity for public comment on the project are scheduled:

- Date/Time: June18, 2019, 2-4 pm and 7-9 pm. A presentation of the project will be made at 2:30 PM and 7:30 PM, followed by the opportunity for hearing attendees to provide comments to the project committee. Comments on the DEIS can also be provided directly through dictation (but not to the larger group in attendance) and in writing.
- Location: Saint Peter's University, The Duncan Family Sky Room, 6th Floor 47 Glenwood Avenue Jersey City, NJ 07306.

PUBLIC COMMENT ADDRESSES: Written comments on the DEIS must be sent to one of the following:

- NJ TRANSIT Resilience Program, Capital Planning and Programs Department, One Penn Plaza East, 8th Floor, Newark, NJ 07105.
- The project website: http://njtransitresilienceprogram.com/contact-us/
- Federal Transit Administration Region 2 Office, 1 Bowling Green Room 429, New York, NY, 10004

FOR FURTHER INFORMATION CONTACT:

Mr. John Geitner, Senior Director Environmental, Energy, and Sustainability (EE&S), New Jersey Transit Corporation, One Penn Plaza East, 8th Floor, Newark, NJ 07105; JGeitner@njtransit.com;

Mr. Dan Moser, Community Planner, FTA Region 2, One Bowling Green, Room 429, New York, NY 10004.

Preface

The Federal Transit Administration (FTA) and New Jersey Transit Corporation (NJ TRANSIT) issued a Notice of Intent (NOI) to prepare a draft Environmental Impact Statement (DEIS) on January 7, 2016, for construction of a reliable electric power generation system (microgrid) for the NJ TRANSITGRID TRACTION POWER SYSTEM (proposed Project). The NOI provided a project overview, information on the Project scoping process and advertised the public meeting which was held on February 3, 2016, in Jersey City, New Jersey. The NOI also announced the availability of the *Draft Scoping Document* on the project website (http://njtransitresilienceprogram.com) and requested written comments to be sent to NJ TRANSIT by February 29, 2016.

Since the publication of the *Final Scoping Document* (also available on the project website) in May 2016, the engineering/design phase of the project has progressed, which has resulted in design progression for the proposed Project, as described below.

- **Power output requirements:** The Final Scoping Document stated that the proposed Project would include an approximate 104 megawatts (MW) natural gas-fired electric power generating plant and presented a general description of the Main Facility, indicating that the size and arrangement would depend in part on the selected power plant technology. After consideration of nine equipment and housing configurations during engineering concept validation, and power requirements for the proposed energized assets, it has been determined that the best design option is one that generates approximately 104MW to 140MW.
- **Plant type and Alternatives:** The *Final Scoping Document* stated that two engine technologies and two types of power plants would be evaluated, alone or in combination, as design options—reciprocating engine options (simple-cycle or combined-cycle) and gas turbine options (simple-cycle or combined cycle). As engineering studies progressed and the project details were refined, the design options for the microgrid were reduced from four (4) possible build scenarios, as discussed in the *Final Scoping Document*, to one (1) Build Alternative. The reciprocating engine options were not advanced because sufficiently sized equipment could not be sourced domestically, as required by Buy America (49 C.F.R. § 661 [2012]) requirements. Also, the simple-cycle gas turbine was not as fuel-efficient as the combined-cycle option. Therefore, only one Build Alternative utilizing gas turbines was evaluated in the DEIS. Additionally, the gas turbine option has been studied and refined to include five gas turbines and one steam turbine as the optimal configuration to most effectively meet NJ TRANSIT power generation needs. Two emergency “black start” reciprocating engines would also be included in the Build Alternative.
- **Electrical line installation:** As engineering design has progressed, the use of existing catenary structures was determined to be infeasible, and all connections would require new electrical lines. The preferred design option for new electrical lines is installation through a combination

of overhead lines, underground duct banks and attachment to existing transportation infrastructure along current rail right-of-way.

- **Routing of electrical lines:** The preliminary routing options presented in the *Final Scoping Document* were refined using information gathered during the design phase to better meet the purpose and need of the project and provide optimal connections between project elements while minimizing environmental impacts. The alternative electrical line routing through an existing Conrail tunnel has been screened from consideration. The proposed electrical line routes are detailed in Chapter 2, "Project Alternatives." The utility corridor from the Main Facility to a new Kearny Substation is highly congested with existing infrastructure; therefore, two route options (one preferred route option and one alternative route option) are under consideration, both of which are within property owned by NJ TRANSIT and are evaluated in the DEIS.
- **Connection to the southern portion of Hudson-Bergen Light Rail (HBLR):** Because of potential impacts to existing infrastructure and environmental impacts, the proposed Project would include two approximately 2MW natural gas-fired emergency generators (a "nanogrid") capable of producing the necessary power for the HBLR south loads. These would be installed on NJ TRANSIT-owned property at the HBLR Headquarters on Caven Point Avenue in Jersey City. Additional equipment to store energy to help smooth out the instantaneous load profile of the HBLR traction loads would also be required, in the form of batteries or flywheels.
- **Main Facility:** The proposed layout of the Main Facility has been re-configured to include five gas turbines, one steam turbine and two emergency "black start" reciprocating engines. The five gas turbines and two emergency "black start" reciprocating engines would be housed in outdoor enclosures rather than in one large Main Facility building. The smaller Main Facility building would house the steam turbine, control rooms, offices, maintenance facilities, etc. In addition, a 4-acre parcel of the Main Facility site would be utilized to construct a solar panel facility, generating approximately 0.6MW of clean energy.
- **HBLR:** New electrical lines along the HBLR route were not anticipated to be required at the time of publication of the *Final Scoping Document*, as only sections of the HBLR were anticipated to be energized by the microgrid. Since publication of the *Final Scoping Document*, engineering studies indicated the most feasible option (in terms of cost and efficiency) was to install new electrical lines along the entire corridor of the HBLR, within NJ TRANSIT's right-of-way, providing power to the entire 17-mile route of the HBLR.

Each of the above-mentioned project elements is described in detail in the NJ TRANSITGRID TRACTION POWER SYSTEM DEIS. Since publication of the *Final Scoping Document,* NJ TRANSIT has completed extensive engineering studies and concept validation reviews that included cost analysis and operating scenario studies, as well as the 20% engineering design of the project. The results of these engineering studies have better defined the proposed Project for review in accordance with the National Environmental Policy Act (NEPA) of 1969. The details of the proposed Project and the analysis of the potential environmental effects are presented in this DEIS.

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$\mu g/m^3$	micrograms per cubic meter
AADT	Annual Average Daily Traffic
ACHP	Advisory Council on Historic Preservation
ACO	Administrative Consent Order
ACS	American Community Survey
ADA	Americans with Disability Act
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AIRS	Aeromatic Information Retrieval System
AOC	Area of Concern
APE	Area of Potential Effect
ARRCS	Administrative Requirements for the Remediation of Contaminated Sites
AVE	Area of Visual Effect
BACT	Best Available Control Technology
Beazer	Beazer East, Inc.
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
bhp	Brake horsepower
BMP	Best Management Practice
BPIP	Building Profile Input Program
BPIPPRM	Building Profile Input Program Plume Rise Model
Btu	British Thermal Unit
CAA	Clean Air Act
CARB	California Air Resources Board

CCPW	chromate chemical processing waste
CEA	classification exception area
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
COPR	chromite ore processing residue
CR	County Route
CTG	combustion turbine generator
CWA	Clean Water Act
dBA	Decibels Adjusted (weighted decibels)
DBC	Design, Build, Commission
DEIS	Draft Environmental Impact Statement
DEM	Digital Elevation Model
DFE	Design Flood Elevation
Diamond Shamrock	Diamond Shamrock Corporation
DL&W	Delaware and Lackawanna and Western Railroad
DLN	Dry Low NOx
DNAPL	dense non-aqueous phase liquid
DNAPL IRM	Dense Non-Aqueous Phase Liquid Interim Remedial Measure
DOE	Department of Energy
DOT	Department of Transportation

EA	Effects Assessment
EDR	Environmental Data Resources
EFH	Essential Fish Habitat
EFHA	Essential Fish Habitat Area
EIA	Energy Information Administration
ELRR	Erie-Lackawanna Railroad
EMF	Electromagnetic Field
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESR	Environmental Screening Report
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHA	Flood Hazard Area
FHACA	Flood Hazard Area Control Act
FIRM	Flood Insurance Rate Map
FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GLDD	The Great Lakes Dredge & Dock Company
GPM	gallon per minute
GW	Gigawatts
HAP	Hazardous Air Pollutant

HAPC	Habitat Areas of Particular Concern
HARBS	Historic Architectural Resources Background Study
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBLR	Hudson-Bergen Light Rail
HCIA	Hudson County Improvement Authority
HCIA RFP	Property Disposition Request for Proposals
HDPE	high-density polyethylene
HEPSCD	Hudson Essex Passaic Soil Conservation District
HFC	Hydrofluorocarbon
HHS	Department of Health and Human Services
HMCE	Hazard Mitigation Cost Effectiveness
HRSG	heat recovery steam generators
HUC	Hydraulic Unit Code
HUD	Housing and Urban Development
Hz	Hertz
IPaC	Information for Planning and Conservation
IRM	Interim Remedial Measure
IRT	Interagency Review Team
JD	Jurisdictional Determination
KCSL	Known Contaminated Sites List
KMUA	Kearny Municipal Utilities Authority
kV	Kilovolts
kW	Kilowatts
LAER	Lowest Achievable Emission Rate

lb	Pound
LCP	linear construction project
LNAPL	light non-aqueous phase liquid
LOD	Limit of Disturbance
LSRP	Licensed Site Remediation Professional
m	Meters
MACT	Maximum Achievable Control Technology
MBTA	Migratory Bird Treaty Act of 1918
MCT	Meadowlands Conservation Trust
mG	milliGauss
mg/m^3	milligram per cubic meter
MGD	Million Gallons per Day
MHW	mean high water
MMBtu	Million British Thermal Units
MMC	Meadowlands Maintenance Complex
MMP	Materials Management Plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
mph	miles per hour
MPO	Metropolitan Planning Organization
MRC	Meadowlands Regional Commission
MRI-3	Marsh Resources Incorporated
MW	Megawatt
N.J.A.C.	New Jersey Administration Code
N.J.S.A.	New Jersey Statutes Annotated

N.J.S.A.	New Jersey Statutes Annotated
N_2O	Nitrous Oxide
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum of 1988
NEHI	Network for Excellence in Health and Innovation
NEPA	National Environmental Policy Act of 1969
NF_3	Nitrogen Trifluoride
NFA	No Further Action
NFPA	National Fire Protection Association
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act of 1966
NJ TRANSIT	New Jersey Transit Corporation
NJBPU	New Jersey Board of Public Utilities
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJHPO	New Jersey Historic Preservation Office
NJMC	New Jersey Meadowlands Commission
NJNHP	New Jersey Natural Heritage Program
NJOEM	New Jersey Office of Emergency Management
NJOHSP	New Jersey Office of Homeland Security and Preparedness
NJPDES	New Jersey Pollutant Discharge Elimination System
NJR	New Jersey Register of Historic Places
NJSEA	New Jersey Sports and Exposition Authority
NJSPC	New Jersey State Planning Commission

NJTA	New Jersey Turnpike Authority
NJTPA	North Jersey Transportation Planning Authority
NJTPD	NJ TRANSIT Police Department
NMFS	National Marine Fisheries Service
NNSR	Nonattainment New Source Review
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrogen Oxide
NOx	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NWI	National Wetlands Inventory
NYS&W	New York, Susquehanna and Western (Railroad)
O&M	Operating and Maintenance
O_3	Ozone
OEM	original equipment manufacturer
OSHA	Occupational Safety and Health Administration
P&HRRR	Paterson & Hudson River Railroad
PA	Programmatic Agreement
PAH	Polycyclic Aromatic Hydrocarbon
PANY&NJ	Port Authority of New York and New Jersey
PATH	Port Authority Trans-Hudson

Pb	Lead
PCB	Polychlorinated Biphenyls
PDM	Processed Dredged Material
PFC	Perfluorocarbons
PI	Program Interest
PJM	Pennsylvania Jersey Maryland Interconnection, LLC
PM	Particulate Matter
PM_{10}	Particulate Matter of 10 Microns
$PM_{2.5}$	Particulate Matter of 2.5 Microns
ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million
PPV	peak particle velocities
PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PSE&G	Public Service Electric and Gas Company
PVSC	Passaic Valley Sewerage Commission
RACT	Reasonable Available Control Technology
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
Redevelopment Area	Koppers Coke Redevelopment Area
Redevelopment Plan	Koppers Coke Peninsula Redevelopment Plan
RFP	Request for Proposals
RIR	Remedial Investigation Report
ROC	Rail Operations Center

ROD	Record of Decision
ROSI	Recreation and Open Space Inventory
RTO	Regional Transmission Organization
RTU	Remote Thermal Unit
SAV	Submerged Aquatic Vegetation
SCCC	Standard Chlorine Chemical Company
SCR	Selective Catalytic Reduction
SESC	Soil Erosion and Sediment Control
SF_6	Sulfur Hexafluoride
SFC	static frequency converter
SIP	State Implementation Plan
SLC	sea level change
SLR	sea level rise
SO_2	Sulfur Dioxide
SOTA	State of the Art
SRRA	Site Remediation Reform Act
SSURGO	Soil Survey Geographic Database
SVOC	Semi-volatile organic compounds
SWQS	Surface Water Quality Standard
TAC	Technical Advisory Committee
TCDD	tetrachlorodibenzo-p-dioxin
TIP	Transportation Improvement Program
TOR	top of rail
TRSR	Technical Requirements for Site Remediation
TSS	Total Suspended Solid

TWIC	Transportation Worker Identification Credential
U.S.C	United States Code
UCC	Uniform Construction Code
UEZ	Urban Enterprise Zone
USACE	U.S. Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound
WFD Zone	Waterfront Development Zone
WSS	Web Soil Survey

Executive Summary

ES.1 INTRODUCTION

New Jersey Transit Corporation (NJ TRANSIT[1]) proposes to design and construct the NJ TRANSITGRID TRACTION POWER SYSTEM (proposed Project), a first-of-its-kind "microgrid" designed to provide highly reliable power to support limited service in a core segment of NJ TRANSIT's and Amtrak's[2] critical service territory. As defined by the US Department of Energy (DOE), a microgrid is a local energy grid with "control capability," which means it can disconnect from the commercial power grid and operate autonomously (DOE 2014a).

The Federal Transit Administration (FTA) selected the NJ TRANSITGRID TRACTION POWER SYSTEM as one element of the "NJ TRANSITGRID" project, a Public Transportation Resilience Project in response to Superstorm Sandy. FTA's selection of the proposed Project makes it potentially eligible for funds made available under the Disaster Relief Appropriations Act of 2013 (Pub. L. 113-2). FTA's selection of the NJ TRANSITGRID project was published in Federal Register Notice Vol. 79, No. 214, 65762-65765 on Wednesday, November 5, 2014 (Table 1, Funding ID D2013-RESL-009 "NJ TRANSITGRID").

The proposed NJ TRANSITGRID Project selected by FTA consists of two elements.

1. NJ TRANSITGRID TRACTION POWER SYSTEM – The proposed Project would include a natural gas-fired electric power generating plant (referred to as the Main Facility), and the electrical lines, substations and other emergency generators to distribute the power to required areas (see Figure ES-1). The Main Facility would utilize combined-cycle technology resulting in power generation capacity of approximately 104 to 140 megawatts (MW). The preferred site for the Main Facility is in Kearny, Hudson County, New Jersey (see Figure ES-2).

2. NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS that would provide power to certain train stations, bus garages and other transportation infrastructure in northeastern New Jersey.

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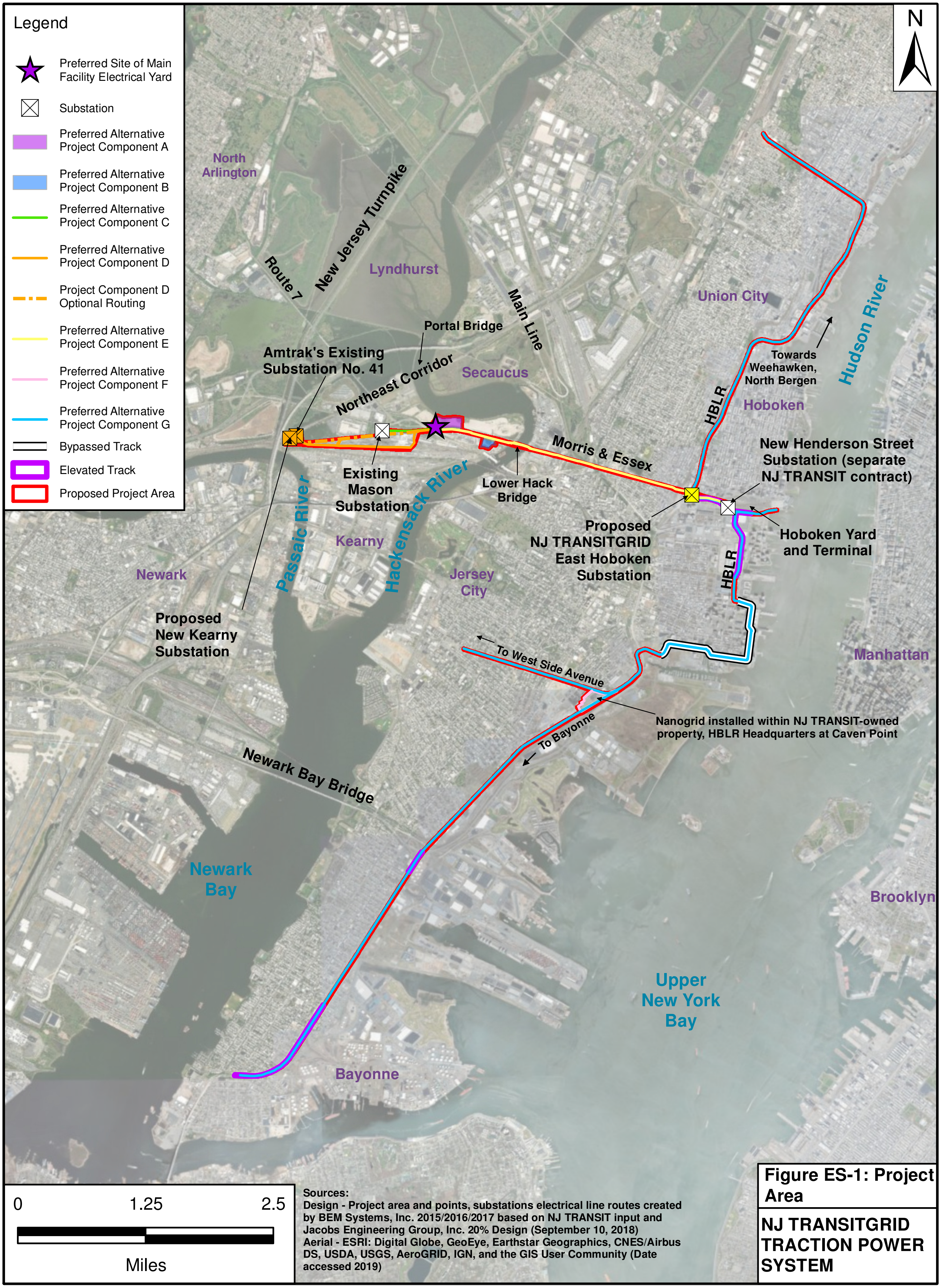
[1] NJ TRANSIT is a state-owned public transportation system that serves the State of New Jersey, along with portions of New York State and Pennsylvania. It operates bus, light rail, and commuter rail services throughout its service area, connecting major commercial and employment centers both within the state and in the adjacent major cities of New York City and Philadelphia. Covering a service area of 5,325 square miles, NJ TRANSIT is the largest statewide public transit system and the third-largest provider of bus, rail, and light rail transit by ridership in the United States.

[2] Amtrak, the National Railroad Passenger Corporation, is a passenger railroad service that provides medium- and long-distance intercity service in the contiguous United States and to three Canadian cities. In New Jersey, Amtrak operates approximately 110 trains daily. Under joint benefit and agreements, NJ TRANSIT operates more than 400 weekday trains along Amtrak's Northeast Corridor.



Sources:
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 - ESRI: Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Date accessed 2019)

Figure ES-1: Project Area

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\FigureES_1_ProjectArea.mxd

Figure ES-2: Proposed NJ TRANSITGRID Project Location

NJ TRANSITGRID TRACTION POWER SYSTEM

Sources:
Energized Assets - NJ TRANSIT, PATH, and PATCO Passanger Right-of-Way lines NJOIT (2016)
Zoning - Town of Kearny Zoning Map (2012)
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 - ESRI: Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Date

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\FigureES_2_ProjectLocation.mxd

As the administer of potential federal funds, FTA is therefore the designated federal lead agency responsible for implementing the National Environmental Policy Act of 1970 (NEPA) pursuant to NEPA implementing regulations 40 CFR Part 1500-1508 and US Department of Transportation (DOT) implementing regulations 23 CFR 771. Because of the potential for the proposed NJ TRANSITGRID TRACTION POWER SYSTEM to have significant environmental impacts, FTA has directed the preparation of this Draft Environmental Impact Statement (DEIS) for that element in accordance with 23 CFR 771.123.

The NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS elements would be constructed and function independently from the NJ TRANSITGRID TRACTION POWER SYSTEM project and provide independent utility with regard to mass transit resilience. Therefore, FTA has determined that the NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS elements will undergo separate environmental review pursuant to 23 CFR 771 and are not included in this DEIS.

ES.2 PURPOSE AND NEED FOR THE PROJECT

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 the New York and New Jersey metropolitan area to minimize public transportation service disruptions. The region's public transportation infrastructure is vulnerable to power outages due to the increasing intensity and frequency of severe weather events which can damage existing power systems. Also, the nature of the current centralized power distribution system creates dependencies on a single power supply and distribution system.

The need for the proposed Project is based on the vulnerability of the commercial power grid that serves NJ TRANSIT's and Amtrak's Northeast Corridor rail service. Over 143,000 commuters use the NJ TRANSIT rail system daily, including those who transfer to other regional public transportation systems. Additionally, in 2016 an average of just under 52,000 daily riders also utilized the NJ TRANSIT operated Hudson-Bergen Light Rail[3] (HBLR). It is also subject to the same power vulnerabilities since it is powered by the commercial electric grid. Reliable electric power is essential to regional mobility because diesel trains are not permitted to operate in the Hudson River rail tunnels due to diesel exhaust, so electric locomotives are required. Electric power is also necessary to operate the signal system to safely route train movements and to power ventilation equipment and pumps in the tunnels. Critical emergency activities require electricity to prepare for and recover from flooding events and damaging winds. Critical emergency facilities including maintenance facilities, pump stations, and emergency operation centers need

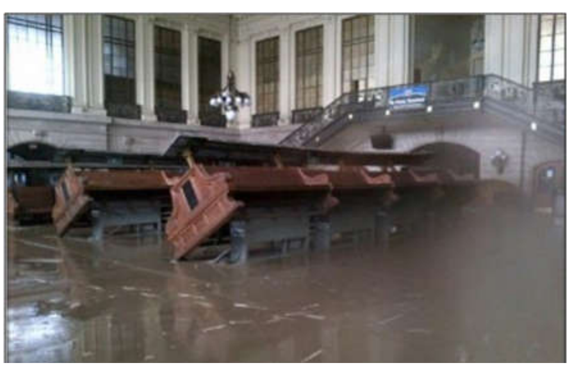


Photo showing interior of flooded Hoboken Terminal following Sandy in 2012.

[3] The Hudson–Bergen Light Rail (HBLR) is a light rail system in Hudson County, New Jersey. Owned by NJ TRANSIT and operated by the 21st Century Rail Corporation, it connects the communities of Bayonne, Jersey City, Hoboken, Weehawken, Union City, and North Bergen.

to be energized to pump water from the tunnels and to inspect equipment before returning trains to normal operating service. Despite the use of emergency diesel generators, which offer some degree of resilience (although extended use raises fuel availability concerns and impairs air quality), the region's rail transportation system was largely shut down due to flooding and power outages after Superstorm Sandy in 2012, with enormous economic and societal consequences. The loss of rail service in its entirety for nearly a week challenged all prior expectations of the system's resilience.

Following Superstorm Sandy, the 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. This proposed Project is a result of that partnership and is designed to meet the objectives of national and state energy goals[4] by contributing to diverse portfolios of cleaner and more resilient energy generation systems.

The analysis of potential environmental effects is based on NJ TRANSIT's 20% design package for the microgrid, dated September 10, 2018. While the design details of the Main Facility will continue to be refined as engineering stages progress, the environmental analyses in this document evaluate a reasonable worst-case impact scenario of the proposed equipment and footprint identified in the 20% design review package. To provide the most conservative environmental impact analyses, this DEIS assumes the proposed Project would include five natural gas turbines and one steam turbine with a total output of 104MW to 140MW of mechanical power operating at maximum capacity. This accounts for the optional use of excess power generation capacity to stabilize power output fluctuations as load demand (total power required) changes and will accommodate uninterrupted service while allowing for routine maintenance on the power generation equipment. Additionally, the potential installation methods for the electrical lines (e.g., monopoles, duct banks, submarine cable, directional drilling, and attachment to existing transportation infrastructure) are included in the project description for this DEIS.

The overarching premise for the proposed Project is for the microgrid to generate enough independent power in a resilient manner to energize the identified transportation assets during emergencies. The power generated by the microgrid would replace power that NJ TRANSIT would otherwise purchase through the commercial grid. While the operation of the microgrid would require facility maintenance and the purchase of natural gas for power generation, it is expected that these operational costs will be offset by energy savings and sales. More notably, the microgrid would be resilient, making the transportation system substantially less vulnerable to outages, and thereby able to provide reliable and safe service to commuters. In the event of a necessary evacuation or other emergency situation, commuters would have reliable access to transportation out of harm's way and to central meeting and safe shelter locations such as area hospitals, schools and churches. This would protect trans-Hudson and other commuters from being stranded during weather and non-weather-related events that cause outages to the commercial grid.

[4] State energy goals are included in the New Jersey Energy Master Plan, updated in 2015. Some national energy goals are included in the DOE's Strategic Plan for 2014-2018.

ES.3 SITING OF MAIN FACILITY

In 2015, NJ TRANSIT conducted a siting analysis for the selection of the location of the proposed Main Facility. Transmission losses of electricity are proportional to distance. In order to maximize efficiency of the microgrid, it needs to be located in close proximity to Amtrak's Substation No. 41 (servicing the high ridership Northeast Corridor) and NJ TRANSIT's Mason Substation (servicing the Morris & Essex Line) as these two centrally located substations would receive the highest power input from the microgrid via electrical lines that would run from the generation site to the substations. Therefore, the siting analysis focused on screening 21 industrial properties on the Kearny Peninsula (where both substations are located) based on criteria related to land availability and how well each evaluated site would support the purpose and need established for the proposed Project. This siting analysis lead to the selection of the preferred site for the Main Facility in Kearny, Hudson County, New Jersey. The remaining 20 sites were eliminated from consideration due to feasibility of achieving connectivity and site distance to the railroad, existing and planned land uses, potential impacts to wetlands and other natural resources, and existing contamination. The preferred site is part of a large tract of land referred to as the Koppers Koke Site, currently owned by the Hudson County Improvement Authority (HCIA), which lies within the Koppers Coke Redevelopment Area (Redevelopment Area)[5]. The Meadowlands Regional Commission (MRC) (formerly New Jersey Meadowlands Commission [NJMC]), which resides within and is managed by the New Jersey Sports and Exposition Authority[6] (NJSEA), is seeking to encourage brownfield redevelopment on this parcel.

The entire Koppers Koke property is approximately 170 acres. HCIA has prepared approximately 126 acres of the Koppers Koke property for development by significantly elevating the site above the minimum design flood elevation (DFE) criteria to comply with New Jersey's Uniform Construction Code (UCC) and other relevant requirements (5 New Jersey Administrative Code [N.J.A.C.] § 23 [2013]). NJ TRANSIT's DFE for the Main Facility is +12.0 feet relative to the North American Vertical Datum of 1988 (NAVD88). This consists of using the Federal Emergency Management Agency (FEMA) base flood elevation[7] (BFE) of +8.0 feet NAVD88 and adding 2.5 feet to adjust for relative sea level change (SLC) expected over the 50-year Project life at this preferred location. The Sea Level Rise (SLR) calculation was obtained from the National Oceanic and Atmospheric Administration (NOAA) online SLC calculator using the NOAA Intermediate-High scenario, which projects an increase in sea level of 2.5 feet over the next 100 years. To this value a minimum of +1.0 foot was added, as required by the FTA for construction in the coastal zone (Emergency Relief Program, Interim Final Rule), as well as an additional +0.5-foot factor of safety that acknowledges the criticality and cost of the state's railroad infrastructure, for a final DFE of +12 feet

[5] *Koppers Coke Redevelopment Plan, Kearny, New Jersey.* Adopted by the New Jersey Meadowlands Commission (NJMC) Resolution No. 13-07 on February 27, 2013.

[6] NJSEA is the regional planning and zoning agency for the 30.4-square-mile Hackensack Meadowlands District through its absorption of the former New Jersey Meadowlands Commission (NJMC) in 2015, (*http://www.njsea.com/njmc/about/who-we-are.html*).

[7] The computed elevation to which floodwater is anticipated to rise during the base flood (i.e., flood with a 1% annual chance of occurrence). Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium (*https://www.fema.gov/base-flood-elevation*).

NAVD88. The current ground elevations of the Koppers Koke property are approximately +25 feet NAVD88, so the site complies with the NJ TRANSIT DFE as well as FTA's Emergency Relief Program 49 U.S.C. 5324 section 4.2.3 Floodplain Management. Using this approach will greatly increase the microgrid's storm resiliency and therefore NJ TRANSIT and Amtrak's service resilience to future storm events, such as Superstorm Sandy.

The high vulnerability of the regional commercial power is also documented by the *Overview of New Jersey Power Outages: Risks to the New Jersey Grid,*[8] which indicates a trend of increasing number of outages reported and number of days of power disruption due to hurricane/tropical storms over the past 20 years. This is likely a result of both increased severity of the storms as well as increasing vulnerability of an aging power grid. Using the Hazard Mitigation Cost Effectiveness (HMCE) Tool[9] to determine qualitative benefits from the proposed Project, resilience damages were looked at in terms of recurrence intervals (years). After the proposed Project is complete, flood-induced service interruptions would be reduced from an approximately 1% annual chance of occurrence (equivalent to Superstorm Sandy) to approximately a 0.0009% annual chance of occurrence. In other words, the proposed Project, at the increased elevation of at least 12 feet above the DFE (at approximately +25 feet NAVD88), would provide an extremely high level of protection from coastal flooding.

NJ TRANSIT would use approximately 26 acres within the Redevelopment Area that NJ TRANSIT is acquiring as part of unrelated litigation. The Main Facility (Preferred Alternative Project Component A) would occupy 20 acres within the Koppers Koke Site. A new metering station and connection to existing natural gas pipelines (Preferred Alternative Project Component B) would be installed within a six-acre parcel located south of the Morris & Essex Line (see Figure ES-3).

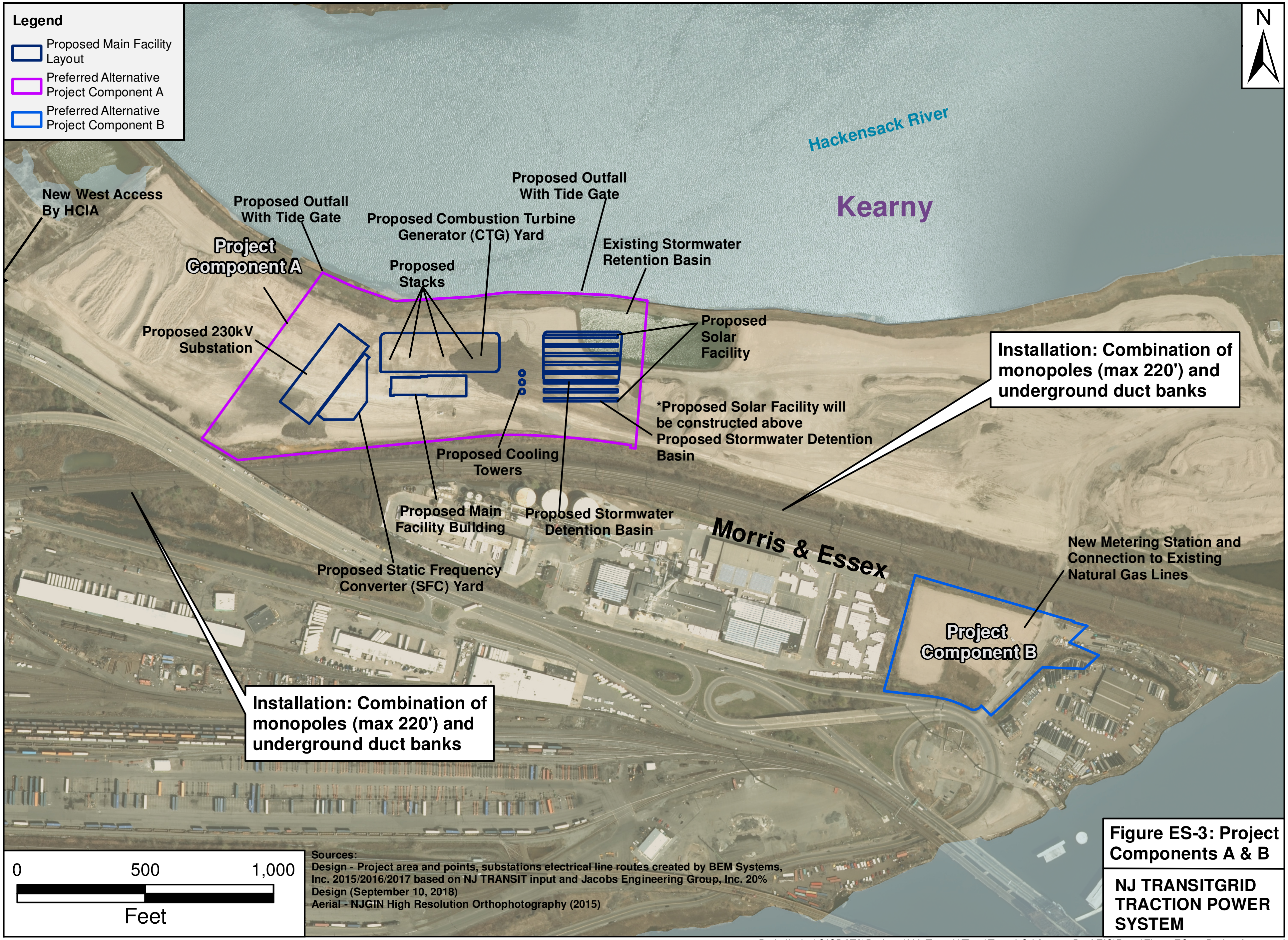
Based on comments received during the scoping process in early 2016 for this DEIS, alternative sites, outside of Kearny, NJ, were identified and evaluated for their ability to meet the goals and objectives established for the proposed Project. Three sites were selected for further analysis, one in Harrison, NJ, and two in Jersey City, NJ. However, as detailed in Chapter 2, "Project Alternatives," the three sites outside of Kearny were eliminated from further consideration because they did not meet all aspects of the siting criteria and did not offer any advantage over the use of the selected Kearny site. The primary reasons for elimination of the three sites outside of Kearny were as follows: the sites were located at greater distances from NJ TRANSIT's Mason Substation and Amtrak's Substation No. 41 resulting in increased length of electrical lines, thereby decreasing capacity and efficiency of the electrical lines; required property acquisition; and required environmental investigations and potential remediation to enable use of said sites.

ES.4 PROJECT ALTERNATIVES

The project alternatives analyzed in detail in the DEIS include the No Action Alternative and one Build Alternative. NEPA requires consideration of the No Action Alternative to allow decision makers to

[8] *Overview of New Jersey Power Outages: Risks to the New Jersey Grid*. Rutgers University Center for Energy, Economic & Environmental Policy. March 6, 2014.

[9] *U.S. Department of Transportation, Federal Transit Administration 2014.*



Sources:
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)

Figure ES-3: Project Components A & B

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\FigureES_3_ProjectArea.mxd compare the impacts of approving the proposed Project with the impacts of not approving the proposed Project. The two alternatives for the proposed Project are described below.

ES.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed, and NJ TRANSIT and Amtrak would both 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. The regional power grid is operated by a local grid operator. That operator is known as PJM (Pennsylvania Jersey Maryland, LLC). PJM extends the reach of NJ-based utilities to a larger geographic area covering 13 northeast and mid-Atlantic states and the District of Columbia serving 61 million people. PJM can also accept independent power providers who initiate their own power generation concepts with an intention of selling surplus power to the regional grid. The commercial grid is vulnerable, however, to local power disruptions in that it must then manage distribution of remaining regional power in such a way that critical needs are met without overloading the remaining providers. As was demonstrated during Superstorm Sandy and other storms, the local commercial utility power system in New Jersey is vulnerable to weather-related outages. These power outages could leave NJ TRANSIT's service disrupted and incapable to operate for several days, if not longer, due to the dependency of the rail system on the existing commercial grid.

During a future storm event equivalent to a 100-year storm event (i.e., a storm with a 1% annual chance of occurrence), there may be system outages as seen during Superstorm Sandy that would leave NJ TRANSIT's service disrupted and incapable to operate for several days, if not longer, due to the dependency of the rail system on the existing commercial grid. These storms are expected to become more frequent in the future. Under the No Action Alternative, other planned and programmed transportation improvements for which funding and commitment have been identified would take place by 2021, independent of the Build Alternative, but these would not improve the resiliency of NJ TRANSIT's traction power. 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. However, during future widespread power outages, the benefits of NJ TRANSIT possessing a reliable power source to move commuters between Manhattan and other destinations in northern New Jersey would not be realized. There would be a missed opportunity to increase commuter safety and security in future widespread power outages.

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, which is 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 on the Koppers Koke Site as well as the six-acre parcel from HCIA. This acquisition is currently moving forward under a Settlement Term Sheet agreed to by NJ TRANSIT and HCIA, as discussed in Chapter 2, "Project Alternatives." In the absence of the proposed Project, it is likely these portions of the Koppers Koke Site would be used for other NJ TRANSIT transportation purposes consistent with local zoning and redevelopment plans.

ES.4.2 Build Alternative

NJ TRANSIT is considering one Build Alternative, which would include a Main Facility with a potential power output between 104MW and 140MW, the installation of up to 19.6 miles of new electrical lines, the construction of two new electrical substations, and the installation of emergency generators (the "nanogrid"[10]) at HBLR Headquarters. The primary fixed facilities (including Project Components A and B) would be built within the Redevelopment Area on a 20-acre footprint (for the Main Facility) and a separate 6-acre area (for new metering stations and pipeline connections). All construction activities would take place within transportation rights-of-way or within existing easements, as noted in Chapter 3 "Land Use, Zoning and Public Policy." The NJ TRANSITGRID TRACTION POWER SYSTEM Project Components A through G are integrated and contingent and cannot operate independently of each other without compromising the overall microgrid's purpose and need in servicing the daily commuter ridership (as shown in Figures ES-1 and ES-3):

- Preferred Alternative Project Component A: Construction of a power generating plant, project substations, transformers, frequency converters, and other equipment on the 20-acre site within the Redevelopment Area. The power generating equipment for the Build Alternative consists of:
  - Five gas turbines (21MW to 25MW each);
    - Two of these will be connected to heat recovery steam generators (HRSG)
  - One steam turbine (14MW to 18MW);
  - Two emergency "black start[11]" reciprocating engines (not to exceed 2.5MW each); and
  - A solar facility generating approximately 0.6MW occupying approximately four acres on the Main Facility site.

The Main Facility building would include approximately 32,000 square feet of working and office space. Four of the 20 acres would be utilized for construction of a solar facility generating approximately 0.6MW, built above a stormwater detention basin. Preferred Alternative Project Component A also includes installation of a new stormwater collection, detention and discharge system and the installation of new water supply and sewer connections to existing municipal water and sewer systems. In the early design stages, NJ TRANSIT has proposed a driveway for access to the Main Facility site. The driveway would be connected to westbound lanes of Route 7 and would provide access along the southwest boundary of the Koppers Koke site to the Main Facility footprint.

[10] The nanogrid consists of two natural gas-fired emergency generators capable of producing the necessary power (approximately 2MW each) for the southern segment of the HBLR, which is in addition to the 104MW to 140MW that would be produced by the microgrid. It would include some measure of stored energy in the form of batteries or flywheels to smooth the instantaneous load profile of the HBLR traction loads. The term "nanogrid" refers to small microgrids that typically serve a single building or a single load. For the proposed Project, during commercial power outages, the nanogrid would serve the southern segment of the HBLR from Essex Street Station in Jersey City to 8th Street Station in Bayonne. The West Side Avenue segment in Jersey City will also be powered by the nanogrid when the commercial power grid is down.

[11] A "black start" is the process of restoring an electric power station or a part of an electric grid to operation without relying on the external electrical transmission network. Normally, the electric power use within the plant is provided from the plant's own generators.

- Preferred Alternative Project Component B: Construction of a new pipeline interconnection and new natural gas metering stations on the six-acre parcel located south of the Morris & Essex Line, within the Redevelopment Area.
- Preferred Alternative Project Component C: Installation of approximately 0.7 miles of new electrical lines from the Main Facility to NJ TRANSIT's existing Mason Substation. Electrical lines would be installed through combination of monopoles (maximum 220 feet tall) and underground duct banks (maximum six feet deep) within transportation right-of-way along the Morris & Essex Line.
- Project Component D: Installation of electrical lines from the Main Facility to Amtrak's existing Substation No. 41 and the new Kearny Substation. The Preferred Alternative for the electrical line from the Main Facility to the new Kearny Substation would be routed through the existing rail line and through the rail yard in the area of the Meadowlands Maintenance Complex (MMC) and the Morris & Essex Line. The Morris & Essex Line in this area is a highly congested utility corridor. To avoid the existing utilities, under the preferred routing, the electrical line for Project Component D would 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 (total of 1.47 miles). Once it reaches Cedar Creek Marsh South, the electrical line would continue to the existing Amtrak Substation No. 41 gantry and on to the location of the new Kearny Substation, within NJ TRANSIT and Amtrak rights-of-way. As an optional routing, the electrical line could travel along the Morris & Essex right-of-way until it reaches Cedar Creek Marsh South (total of 1.35 miles). Due to a number of factors, including access, existing local utilities and geology, the electrical line to the new Kearny Substation could travel south briefly from the Morris & Essex Line before reaching the marsh (total of 1.39 miles). Electrical lines would be installed through combination of monopoles (maximum 220 feet tall) and underground duct banks (maximum six feet deep) within existing transportation right-of-way. Preferred Alternative Project Component D would also include construction of the new Kearny Substation in Cedar Creek Marsh South on Amtrak property. A new Kearny Substation would be located adjacent to the existing Substation No. 41 to accommodate the new connections from the Main Facility to the Northeast Corridor, replacing the function of the existing Substation No. 41. Project Component D would also include decommissioning and removal of existing Substation No. 41 equipment, leaving the existing pad and lattice structures in place to be used for routing of new electrical lines.
- Preferred Alternative Project Component E: Installation of approximately three miles of new electrical lines from the Main Facility to a new NJ TRANSITGRID East Hoboken Substation, with electrical lines continuing to Henderson Street Substation. Electrical lines would be installed through combination of monopoles (maximum 220 feet tall from the Main Facility to the Hackensack River and maximum 65 feet tall from the Hackensack River to the Henderson Street Substation in Jersey City) and underground duct banks (maximum six feet deep) within transportation right-of-way. The Preferred Alternative for the Hackensack River crossing is via aerial crossing (maximum 220 feet tall) approximately 50 feet north of the Lower Hack Bridge, but optional crossings via submarine cable or by directional drilling were also evaluated. Preferred Alternative Project Component E also includes installation of a segment of the electrical line

through an existing NJ TRANSIT-owned tunnel (south tube of the Bergen Tunnels), as well as construction of the new NJ TRANSITGRID East Hoboken Substation. Where the electrical line travels from the new NJ TRANSITGRID East Hoboken Substation, the electrical line would also be attached to NJ TRANSIT-owned structures (i.e., HBLR bridge).

- Preferred Alternative Project Component F: For connectivity to the southern portion of HBLR, a smaller “nanogrid” would be installed on NJ TRANSIT-owned property at the HBLR Headquarters on Caven Point Avenue in Jersey City. The nanogrid would consist of two natural gas-fired emergency generators capable of producing approximately 2MW each to power the HBLR south loads (approximately 8.66 miles). Natural gas connections are already in place at HBLR Headquarters and the existing connections will be used for the two natural gas-fired emergency generators. Some measure of stored energy is also anticipated to be required in the form of batteries or flywheels to help smooth out the instantaneous load profile of the HBLR traction loads.
- Preferred Alternative Project Component G: 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. The three routes of the HBLR that would receive power from the proposed Project are Tonnelle Avenue, operating between North Bergen and Hoboken; 8th Street, operating between Bayonne and Hoboken; and West Side Avenue, operating in Jersey City. Electrical lines would be installed on new utility poles (maximum 39 feet tall), in underground duct banks (maximum six feet deep), or attached to existing elevated HBLR structures, all within the HBLR right-of-way.

ES.5 SUMMARY OF POTENTIAL SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS

Under the No Action Alternative, Amtrak intends to replace the existing Substation No. 41 with a new substation on an elevated concrete pad on piers in Cedar Creek Marsh South. Additionally, the existing lattice towers in the marsh will be replaced with a monopole to carry electrical lines. Therefore, under the No Action Alternative, approximately two acres of Cedar Creek Marsh South will be impacted. These waters are hydrologically restricted from the Hackensack River due to active tide gates and the habitat value is low relative to other more connected portions of Cedar Creek Marsh. Under the Build Alternative, the proposed Project would construct the replacement substation in Cedar Creek Marsh South, so the environmental effects of that construction were evaluated as part of the Build Alternative as well.

The effects of the Build Alternative, including the cumulative effects of each Project Component, on the full range of social, economic, and environmental impacts are presented in Table ES-1. While the Build Alternative would not result in significant adverse effects on social, economic or environmental conditions in the study area that could not be mitigated, there would be some non-significant impacts alleviated by proposed, suitable and commensurate mitigation to the following evaluated environmental categories: Air Quality, Greenhouse Gas (GHG) Emissions, Historic Resources, Traffic and Public Transportation, Natural Resources, and Utilities. Additionally, temporary construction impacts would occur and are evaluated in this DEIS and would also be reduced with provided mitigation measures. As designed, the Build Alternative is not anticipated to pose any State or Federal regulatory permitting compliance issues[12].

The environmental analyses considered the potential effects in study areas that were defined for each specific environmental topic area. Effects on Air Quality, GHG Emissions, Visual, Historic Resources, and Utilities may differ based on the final Main Facility configuration and connectivity options chosen but the analysis in this DEIS represents potential worst-case effects. The analysis presented describes the effects of normal operating conditions. If the potential effects under emergency operating conditions differ from those of normal operating conditions, those effects are described separately in the appropriate resource chapters.

[12] Anticipated permits include: New Jersey Pollutant Discharge Elimination System (NJPDES) Permit for the discharge of water directly into the Hackensack River channel; New Jersey Department of Environmental Protection (NJDEP) Flood Hazard Area (FHA) Individual Permit and FHA Verification for the proposed fill and development activities within the floodplain associated with the Hackensack River; NJDEP Waterfront Development Upland (WFD) and In-Water Individual Permit for activities located within the WFD Zone and below the mean high water line of the Hackensack River; Water Quality Certificate for the disturbances proposed within waters of the United States and wetlands; Untied States Army Corps of Engineers (USACE) Section 10/404 Individual Permit for the proposed wetland and navigable water disturbances and fill activities; and Title V Air Permit.

Table ES-1 Summary of Potential Impacts and Mitigation for Build Alternative

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Land Use, Zoning and Public Policy	The Build Alternative is compatible with land use, zoning, and public policy in the study area. The preferred site for the Main Facility is currently a vacant brownfield site. The MRC/NJSEA is seeking redevelopment of brownfield sites in their jurisdiction. The proposed Project would return the property, which has laid dormant for 40 years, to active use.	None. Construction activities would take place within existing transportation rights-of-way or easements. The property acquisition for the 20-acre parcel and the six-acre parcel would be complete prior to commencement of construction.	None	No mitigation is required however, there would be an adverse effect on two acres within Cedar Creek Marsh South, as discussed under Natural Resources. Additionally, the Build Alternative would return a vacant brownfield site to active use, which is a positive net result.	NJ TRANSIT's acquisition of the two parcels (20-acre and six-acre) would proceed as planned without the proposed Project. A new Kearny Substation would still be constructed under the No Action Alternative, therefore some changes to land use would still occur.

[13] Minimization measures to reduce impacts are developed and identified as a result of the environmental analysis in this DEIS. Mitigation commitments are obligations identified for significant impacts to resources that exceed a permitting threshold that NJ TRANSIT will fulfill as part of the project, such as obtaining appropriate wetland mitigation credits (to replace the impacted 2 acres of freshwater wetland resource as required by regulatory agencies) and permits prior to construction and ongoing consultation with regulatory agencies as the project design progresses. As noted in this DEIS, all adverse impacts (including insignificant impacts) have been minimized through project design, and as required will be mitigated for under the permitting process, via credit purchase, or through consultation and direction from the regulatory agencies.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Community Facilities	None. No community facilities, parks, or publicly accessible open space, are located directly within the proposed Project's footprint, including electrical line routes, and no services would be adversely affected during operation.	Some temporary/short duration increases in noise levels near some community facilities during construction.	Control Measure and Minimization: Conduct construction during business hours to minimize noise impacts to nearby community facilities.	Under evacuation scenarios, commuters would have access to designated central meeting points, such as schools, hospitals, and safe shelters.	None
Socio-economic Conditions and Environmental Justice	None. No adverse effects on neighborhood cohesiveness or economic conditions would occur as the proposed Project area is entirely within industrial areas and transportation rights-of-way. Approximately 30 full-time jobs will be created for staffing the Main Facility.	Some short-term (48 months) economic benefits from creation of temporary construction jobs. Some temporary/ short duration increases in noise levels near some neighborhoods during construction.	Control Measure and Minimization: Conduct construction during business hours to minimize noise impacts to nearby neighborhoods and residential properties.	Positive net result through creation of approximately 30 full time jobs to operate the Main Facility, and to support commuter travel during commercial power grid outages.	Missed opportunity to increase commuter safety and security in future widespread power outages. No new employment opportunities would be realized.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Air Quality	Overall air emissions would increase slightly for Nitrogen Oxide (NOx), Carbon Monoxide (CO) and Hazardous Air Pollutants (HAPs) due to the Main Facility but would be minimized via pollution controls (selective catalytic reduction [SCR] and oxidation catalyst systems) incorporated into the design of the Main Facility. Due to the use of clean burning natural gas, minimal particulates, sulfates, ammonia, or lead will be emitted by the Main Facility. Reduced demand on the commercial grid could partially offset increased emissions in the region.	Potential for increased fugitive dust during construction, and some increased emissions from construction equipment. With mitigation measures, no significant adverse effects on air quality would occur during construction.	Control Measure and Minimization: Consultation with New Jersey Department of Environmental Protection (NJDEP), development of additional measures to reduce pollutant emissions which would be monitored by the Title V permit/ NJDEP, and adherence to Title V permit conditions, including purchase of NO_x credits. During construction, quality control measures to reduce fugitive dust would be implemented. Construction equipment would use Tier 4-compliant engines to reduce emissions.	Net effects: Under 24/7 operations, the Build Alternative would have minimal impact on Air Quality. Modern technology employed would minimize emissions. Those impacts could be partially offset by reduced demand from the commercial power generation plant.	Potential minimal increase in emissions would not be realized. Benefits from solar facility would not be realized. NJ TRANSIT and Amtrak would continue to rely on the commercial grid for traction power in the core service territory, which includes facilities that burn oil and coal.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Greenhouse Gas Emissions	The estimated amount of GHGs (approximately 576,802 metric tons per year of CO_2e) generated by the worst-case Build Alternative is less than 0.6 percent of the GHGs generated in the state of New Jersey. This assumes all 5 turbines would run continuously (8,760 hours per year). Actual GHG emissions will be lower since all five turbines would not run simultaneously at maximum capacity.	Temporary increase in GHG emissions during construction would result from non-road construction engines and on-road trucks would be limited and short-term. With certain commitments, the temporary GHG emissions from construction would not result in significant adverse effects.	Control Measure and Minimization: Pollution controls incorporated into the design (SCR and oxidation catalyst systems). During construction, contractors would be required to source materials locally when feasible, use biodiesel fuel when possible, design efficient transportation routes and adhere to air quality control measures listed above.	The energized assets of the project will no longer use electricity from the commercial power grid. The reduced commercial demand could offset some emissions. During emergency conditions, the availability of public transportation would reduce the need for less efficient transportation modes, which could result in reduced GHG emissions during that time.	Potential minimal increase in GHG emissions would not occur. During emergencies, public transportation would not be as available, so less-efficient travel modes would be required, as under current conditions.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Visual Quality	Most significant viewsheds would not be affected by the proposed Project. New monopoles will be designed to be consistent in color and texture to existing monopoles and existing visual character in the various project areas. The Main Facility will be constructed in an existing industrial area. The new substations and the nanogrid would be consistent with surrounding visual character.	All changes in views would be limited and temporary and would not result in significant adverse impacts to visual and aesthetic resources during construction.	None	The proposed Project would be consistent with the surrounding visual character.	Kearny Peninsula would still be developed with warehouses and the new Kearny Substation would still be constructed in Cedar Creek Marsh South. However, these would not be significant impacts to Visual Quality in the project area.
Historic Resources	There will be an adverse visual effect on 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	The construction-period monitoring and mitigation measures would ensure that no significant adverse impacts to historic or archaeological resources occur during construction. There is the potential to encounter archaeological	Mitigation: Mitigation measures as described in the PA, include ongoing consultation with NJHPO during continued project development, recordation of historic/ architectural resources, preparation and installation of interpretive exhibits that are visible to the public, and having an archaeologist on-site during construction activities in areas designated with archeological resource potential. Any	The opportunity to learn about this specific corridor is not currently available to the general public or current commuters. Recordation and public availability of display signs will provide education to the same individuals that use this Historic District for their daily commutes.	Lost opportunity to educate commuters on the described historic district and contributing resources.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
	Historic District. With the mitigation measures included in the draft Programmatic Agreement (PA) between FTA, New Jersey State Historic Preservation Office (NJ HPO) and NJ TRANSIT to minimize harm, the proposed Project would not result in a proximity impact that is so severe that the attributes that qualify the property for protection will be substantially impaired.	resources depending on design of supporting infrastructure (e.g., electrical line installation, sanitary sewer connection, pile driving, directional drilling, etc.).	physical alterations to other architectural resources will be designed in accordance with the *Secretary of the Interior's Standards for Rehabilitation.*		

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Traffic and Transportation	Minimal amount of traffic (approximately 20 trips per each shift, three shifts per day for 30 full time employees) generated by Main Facility would be easily accommodated into the traffic network with little noticeable effect. Positive effects on public transportation in the region would be realized during emergency conditions since limited rail service would be available.	Temporary (non-significant) increase in vehicular traffic during construction from workers traveling to and from the site and equipment deliveries. Some limited, planned train service disruptions may be required to accommodate construction activities, such as installation of electrical lines, deliveries for large pieces of equipment (i.e., the turbines or generators if brought in by rail) and cutover from existing Substation No. 41 to the new Kearny Substation.	Control Measure and Minimization: Planned service disruptions would be infrequent during construction and minimized to avoid impacts to commuters.	During emergency conditions, rail commuters would have access to reliable, although limited, rail service, resulting in a lesser impact to vehicle transportation during emergencies, which is a positive impact.	Traffic in the proposed Project area will increase without the Build Alternative due to planned construction of warehouses on the Kearny Peninsula. Potential for adverse effects (delays and strandings) to commuters during power outages.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
Noise and Vibration	None. Project would be designed to meet all applicable noise and vibration standards, including those set forth for the Redevelopment Area, during operation.	Limited augering, directional drilling, and other construction activities required for installation of substations, monopoles, electrical lines, and other project elements, as required, could result in nuisance noise for a few weeks in any given location. Pile driving for foundations for the Main Facility, new Kearny Substation, and nanogrid would be temporary, and removed from sensitive receptors.	Control Measure and Minimization: Construction activities will be conducted during normal business hours (no earlier than 7AM and no later than 7PM, where practical) when activities are near residential areas. Noise or vibration impacts related to aquatic habitats will be avoided through construction windows/seasonal restrictions defined in applicable permits.	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.	None
Natural Resources	Approximately 1.7 acres filling of open water resource in Cedar Creek Marsh South for new Kearny Substation and monopole improvements	All construction effects would be temporary. Pile driving/auger drilling in Cedar Creek Marsh South	Mitigation: Purchase of State and Federal approved compensatory wetland mitigation credits in accordance with mitigation hierarchy. Permit acquisition	Wetland credit purchase is assumed to be an estimated, equivalence of 1 credit = 2.4 acres of restored high value, functional	Approximately 1.7 acres of wetlands (Cedar Creek Marsh South) would be impacted with construction of the new Kearny Substation to

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
	would be required. Minor effects on low-value delineated wetlands near Project Components A, B and E. A total of up to two acres of low resource value isolated wetlands for the Build Alternative would be required. During operation of the proposed Project, migratory and endemic fish such as summer, winter flounder and Atlantic or shortnose sturgeon would resume normal foraging and migratory activities. No operational effects are expected for raptors (birds of prey) that would migrate and forage in the project vicinity, or in proximal waters or tidal marsh.	would affect the water bottom and displace local fish and aquatic fauna to other areas of the marsh; however, the habitat value is low because the marsh is hydrologically restricted by tide gates and drainage pipes. Potential impact/ displacement during in-water work to habitat or passage areas for summer/ winter flounder, Freshwater herring and Atlantic shortnose sturgeon if a submarine cable is used to cross the Hackensack River. Bald Eagle and Osprey migratory pathway impact is minimal or negligible as work	(wetlands, flood hazard), adherence to permit conditions and restoration of any vegetation temporarily altered by construction/ access activities. Observation of construction windows coordinated with National Marine Fisheries Service (NMFS) to avoid negative effects on aquatic species in the Hackensack River (if required).	wetlands. Although up to two acres of low value isolated wetlands will be eliminated by the Build Alternative, through compensatory wetland mitigation the project will support the ecological restoration of up to 5 acres of higher value, functional wetlands within a contiguous tidal marsh and aquatic nursery of the Meadowlands.	replace the existing Substation No. 41. No other Natural Resources would be impacted under the No Action Alternative.

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
		is within an active rail corridor with minimal foraging resources. Once construction is completed any normal or transient predation activities would resume.			
Soils and Geology	No effects on soils and geology are expected during operations.	Potential for erosion and sedimentation during construction activities.	Control Measure and Minimization: Use of Soil Erosion and Sediment Control (SESC) and use of Best Management Practices (BMPs).	Development of the unvegetated and vacant site will eliminate fugitive dust once the Build Alternative is operational.	None
Contaminated Materials	No effects on existing contaminated materials are expected during operations. Operation of the Main Facility would require the storage and handling of small amounts of fuel and hazardous non-fuel substances (such as aqueous ammonia and industrial cleaners used for regular maintenance). The proposed Project will be designed to meet or exceed all relevant state	Potential to expose historic fill or contaminated soil and/or groundwater during construction due to known contamination onsite.	Control Measure and Minimization: Preparation of pre-construction limited investigation, Health and Safety Plan (HASP), Remedial Action Workplan (RAWP), Materials Management Plan (MMP), Plans and specification including adherence to regulations. Use of double/multi-cased pilings to minimize potential for contaminant transport at Main Facility and locations of monopoles.	Build Alternative would return a vacant brownfield site to active use, which is a positive net result.	None

Analysis Area	Potential Operational Effects	Potential Construction Effects	Control Measures and Minimization/ Mitigation Commitment[13]	Net Result of Build Alternative with Implemented Mitigation	No Action Alternative Effects
	and federal safety standards.				
Utilities	Extensions of sanitary sewer and municipal water service required. Capacity of services expected to be adequate for the Build Alternative.	New utility extensions would be constructed; however, construction of the Build Alternative would not result in significant adverse impacts to existing utilities.	Control Measure and Minimization: Coordination and agreements with utilities. Acquisition of sanitary sewer and water main extension/ connection permits.	Providing reinforced and reliable electrical infrastructure, to support immediate and long-term electrical needs for public transportation in the core service territory.	None
Safety and Security	None. The facility would be designed to meet and exceed regulatory standards.	Construction workers will be required to attend all applicable NJ TRANSIT and/or Amtrak safety training.	Control Measure and Minimization: Safety and security features incorporated into the design. Preparation and implementation of HASP during construction.	Build Alternative would provide improvements to safety of public transportation users during emergency conditions.	Improvements to safety and security in the region (i.e., providing reliable public transportation if New Jersey and New York City job centers need to be evacuated during widespread outages of the commercial grid) would not be realized.

ES.6 SECTION 106 CONSULTATION AND SECTION 4(F) EVALUATION

Section 106 of the National Historic Preservation Act requires Federal agencies to account for the effects of their undertakings on historic properties that are listed in or meet the eligibility criteria for listing in the National Register of Historic Places (NRHP). Section 4(f) of the DOT Act of 1966, as amended (23 CFR Part § 774-codified in 49 U.S.C. 303) 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.

Concurrently with the NEPA process, the proposed Project is being reviewed in accordance with Section 106 and evaluated in accordance with Section 4(f). FTA and NJ TRANSIT have consulted with the NJHPO and Consulting Parties pursuant to Section 106 consultation requirements. The Consulting Parties for the project 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.

Through the Section 106 consultation process, the NJHPO determined that the Build Alternative would result in an adverse effect to the Old Main DL&W Railroad Historic District, Lower Hack Draw Bridge, the Hackensack River Lift Bridges Historic District, Old and New Bergen Tunnels, West End Through Truss Bridges, West End Interlocking Tower and the DL&W Railroad Boonton Line Historic District. The Build Alternative would also result in the Section 4(f) use of the Old Main DL&W Railroad Historic District. There are no feasible and prudent alternatives to the use of this Section 4(f) property. Measures to avoid, minimize, and mitigate harm to historic properties are included in the stipulations of the draft PA and would be implemented as part of the design and construction of the proposed Project. FTA and NJ TRANSIT will continue to consult with the NJ HPO 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.

ES.7 CONCLUSION

As demonstrated in Table ES-1 above, through the implementation of control measures, minimization and approved mitigation for the proposed minimized environmental effects of the Build Alternative, the public and net benefits derived from the proposed Project substantially outweigh the presented impacts. The proposed Project design is being tailored to minimize all impacts where feasible and mitigation is provided where there is an unavoidable significant adverse impact. The proposed Project provides a reliable and resilient source of power to allow continuous use of a critical segment of the mass transportation system serving the New Jersey and New York City commuters. The need for the proposed Project is paramount, especially in light of the mounting evidence that extreme weather events are likely to increase in frequency and intensity in future years. The proposed Project will provide resiliency before, during and after future major storm events and during non-weather related commercial power disruptions.

ES.8 NEXT AND FINAL STEPS FOR COMPLETION OF NEPA

This DEIS is being made available so that agencies and the public can review and comment on the proposed Project and its potential impacts. Following the close of the comment period (July 19, 2019), comments will be considered in a Final EIS. Pursuant to Section 1319(b) of Map-21, FTA shall, to the maximum extent practicable, combine a Final EIS and Record of Decision (ROD) unless 1) the Final EIS makes substantial changes to the proposed action that are relevant to environmental or safety concerns; or 2) there are significant new circumstances or information relevant to environmental concerns and that bear on the proposed action or the impacts of the proposed action. The Final EIS and ROD will announce and explain FTA's decision and describe any commitments for mitigating potential social, economic, and environmental impacts.

Chapter 1 Purpose and Need

1.1 INTRODUCTION

New Jersey Transit Corporation (NJ TRANSIT[1]) proposes to design and construct the NJ TRANSITGRID TRACTION POWER SYSTEM (proposed Project), a first-of-its-kind "microgrid" designed to provide highly reliable power to support limited service in a core segment of NJ TRANSIT's and Amtrak's[2] critical service territory. As defined by the US Department of Energy (DOE), a microgrid is a local energy grid with "control capability," which means it can disconnect from the commercial power grid and operate autonomously (DOE 2014a).

The Federal Transit Administration (FTA) selected the NJ TRANSITGRID TRACTION POWER SYSTEM as one element of the "NJ TRANSITGRID" project, a Public Transportation Resilience Project in response to Hurricane Sandy. FTA's selection of the proposed Project makes it potentially eligible for funds made available under the Disaster Relief Appropriations Act of 2013 (Pub. L. 113-2). FTA's selection of the NJ TRANSITGRID project was published in Federal Register Notice Vol. 79, No. 214, 65762-65765 on Wednesday, November 5, 2014 (Table 1, Funding ID D2013-RESL-009 "NJ TRANSITGRID").

The proposed NJ TRANSITGRID Project selected by FTA consists of two elements.

1. NJ TRANSITGRID TRACTION POWER SYSTEM – The proposed Project would include a natural gas-fired electric power generating plant (referred to as the Main Facility), and the electrical lines, substations and other emergency generators to distribute the power to required areas (see Figure 1-1). The Main Facility would utilize combined-cycle technology resulting in power generation capacity of approximately 104 to 140 megawatts (MW). The preferred site for the Main Facility is in Kearny, Hudson County, New Jersey (see Figure 1-2).

2. NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS that would provide power to certain train stations, bus garages and other transportation infrastructure in northeastern New Jersey.

As the administer of potential federal funds, FTA is therefore the designated federal lead agency responsible for implementing the National Environmental Policy Act of 1970 (NEPA) pursuant to NEPA implementing regulations 40 CFR Part 1500-1508 and US Department of Transportation (USDOT)

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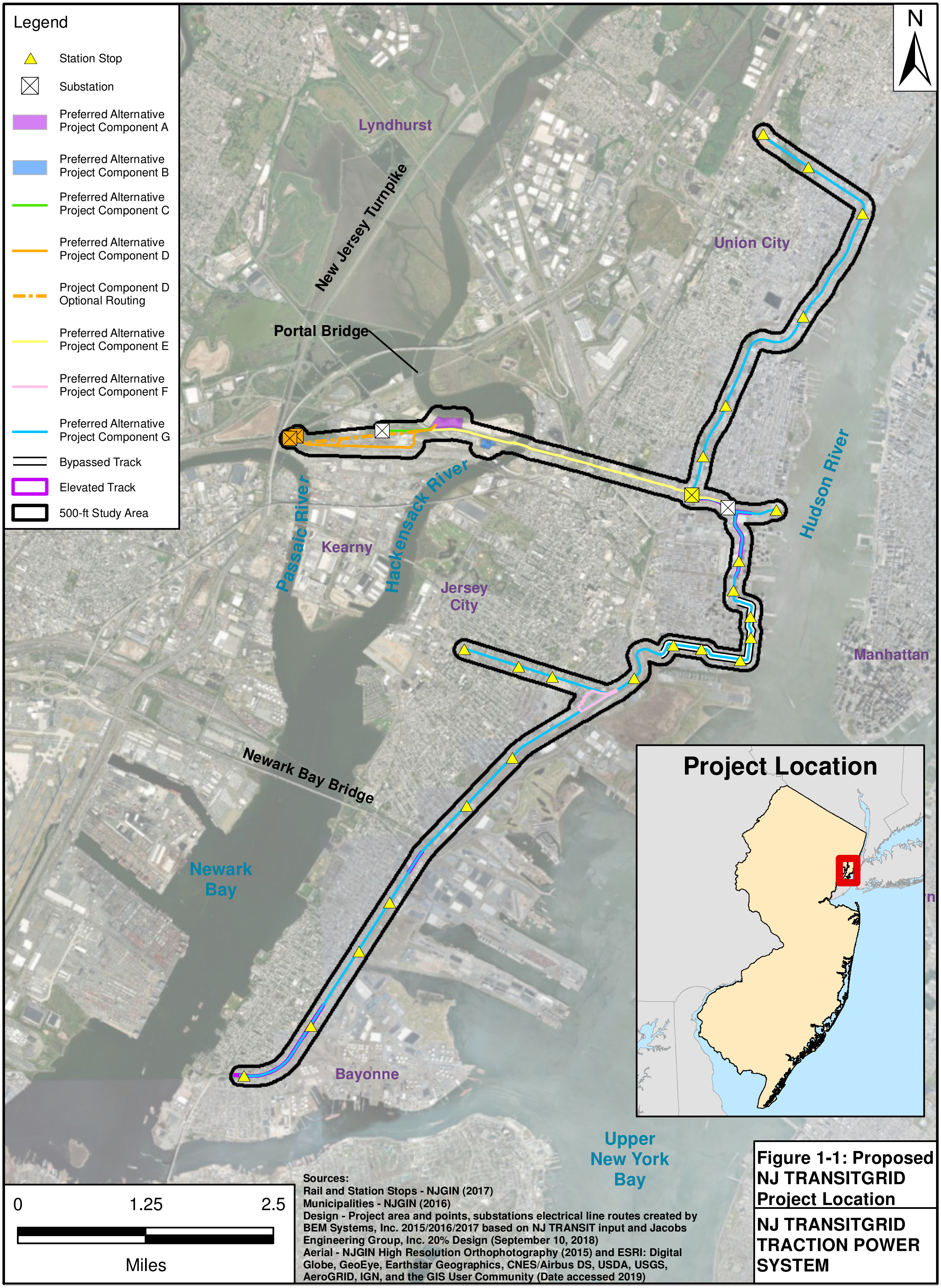
[1] NJ TRANSIT is a state-owned public transportation system that serves the State of New Jersey, along with portions of New York State and Pennsylvania. It operates bus, light rail, and commuter rail services throughout its service area, connecting major commercial and employment centers both within the state and in the adjacent major cities of New York City and Philadelphia. Covering a service area of 5,325 square miles, NJ TRANSIT is the largest statewide public transit system and the third-largest provider of bus, rail, and light rail transit by ridership in the United States.

[2] Amtrak, the National Railroad Passenger Corporation, is a passenger railroad service that provides medium- and long-distance intercity service in the contiguous United States and to three Canadian cities. In New Jersey, Amtrak operates approximately 110 trains daily. Under joint benefit and agreements, NJ TRANSIT operates more than 400 weekday trains along Amtrak's Northeast Corridor.

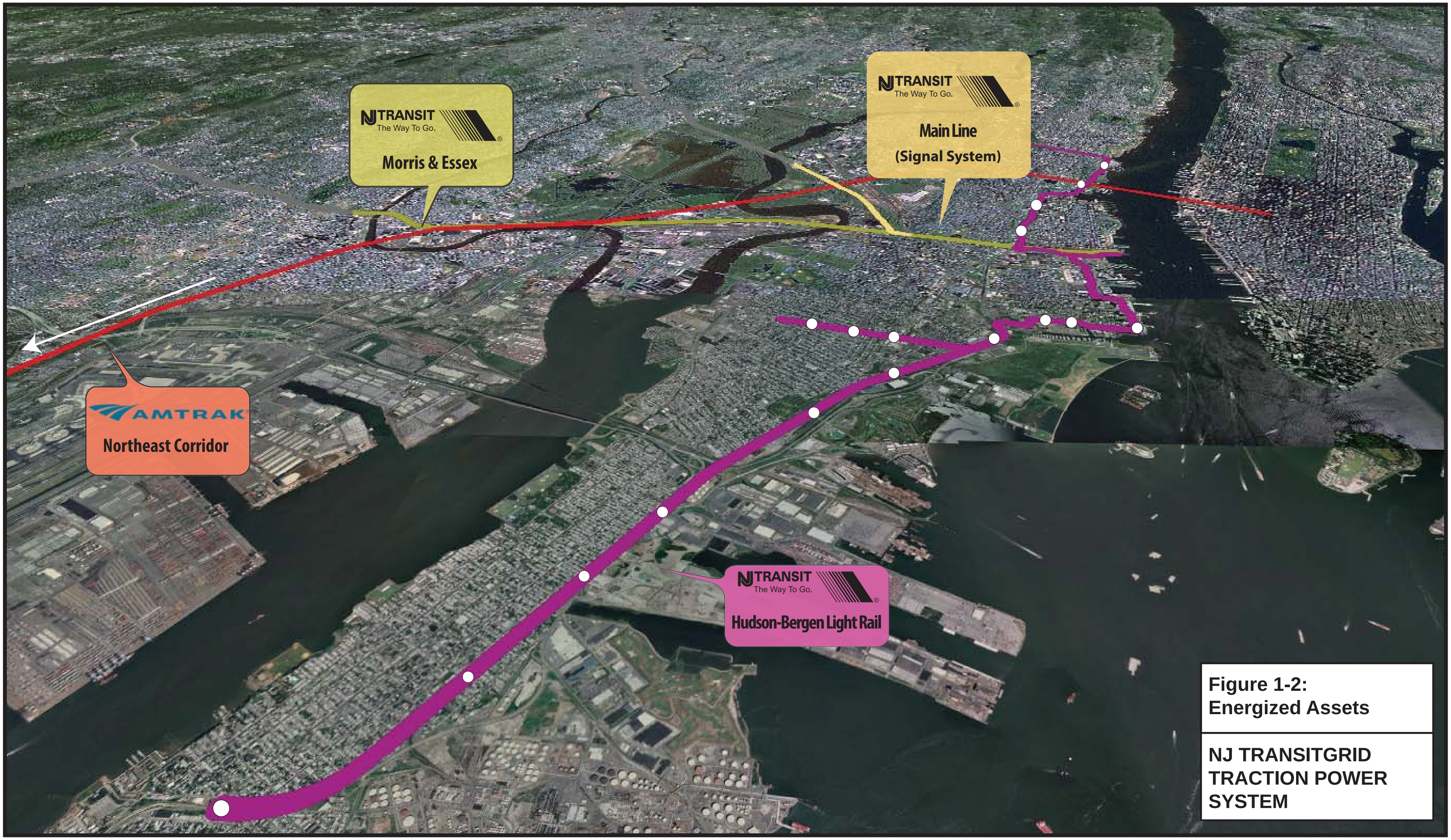


Sources:
Rail and Station Stops - NJGIN (2017)
Municipalities - NJGIN (2016)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
Aerial - NJGIN High 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)

Figure 1-1: Proposed NJ TRANSITGRID Project Location

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure1_1_ProjectLocation.mxd



Note: Energized assets will also include some non-traction loads including: Hudson-Bergen Light Rail stations, Hoboken Terminal, and other signal power, tunnel ventilation, pumping, and lighting loads.

implementing regulations 23 CFR 771. Owing to the proposed NJ TRANSITGRID TRACTION POWER SYSTEM potential for significant environmental impacts, FTA has directed the preparation of this Draft Environmental Impact Statement (DEIS) for that element in accordance with 23 CFR 771.123.

The NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS elements would be constructed and function independently from the NJ TRANSITGRID TRACTION POWER SYSTEM project and provide independent utility with regard to mass transit resilience. Therefore, FTA has determined that the NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS elements will undergo separate environmental review pursuant to 23 CFR 771 and are not included in this DEIS.

Following the public review period (May 20, 2019 – July 19, 2019), comments on the DEIS will be considered in a Final EIS. The Final EIS and Record of Decision (ROD) will announce and explain FTA's decision and describe any commitments for mitigating potential social, economic, and environmental impacts.

This chapter presents the purpose and need for the proposed Project. It also identifies the goals and objectives that guide the development and evaluation of project alternatives, as described in Chapter 2.

1.2 PURPOSE OF THE PROJECT

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. The region's public transportation infrastructure is vulnerable to power outages due to the nature of the existing centralized power distribution system and the intensity and frequency of severe weather events.

The proposed Project would be designed to generate enough electrical power to maintain full operation of commuter and passenger rail service on key segments of the Amtrak Northeast Corridor, NJ TRANSIT Morris & Essex Line, and the NJ TRANSIT Hudson-Bergen Light Rail (HBLR) system (see Figure 1-2) indefinitely and without requiring electrical power from the commercial electrical grid. Specifically, the proposed Project is intended to produce and distribute enough electricity to provide traction (train locomotive) power to Amtrak's Northeast Corridor between New York Penn Station and County Yard/Jersey Avenue Station in New Brunswick, NJ (approximately 32.8 rail miles), NJ TRANSIT commuter rail service between Hoboken Terminal and Millburn Station in Millburn, NJ on the Morris & Essex Line (approximately 16.3 rail miles), and the NJ TRANSIT Hudson Bergen Light Rail (approximately 16.6 rail miles). The proposed Project would also be designed to support non-traction functions (NJ TRANSIT signal power, switches, tunnel ventilation, pumping, station and lighting loads) in the above rail segments and the signal system on a portion of the NJ TRANSIT Main Line from the intersection with the Morris & Essex Line to the Upper Hack Lift Bridge (approximately 2.5 rail miles) so that diesel trains can operate on that non-electrified segment during power outages.

To achieve this, NJ TRANSIT proposes to construct a microgrid. As defined by the U.S. Department of Energy (DOE), a microgrid is a local energy grid with control capability, which means it can disconnect from the traditional grid and operate autonomously (DOE 2014a). The overarching premise for the

the identified transportation assets during emergencies. The microgrid would be resilient, making the transportation system substantially less vulnerable to outages, and thereby able to provide reliable and safe service to commuters.

In addition to the equipment required for the microgrid, approximately four acres of land at the Main Facility site is proposed for a solar (photovoltaic cells) facility. The proposed Project also includes the installation of electrical lines, new substations, and natural gas-fired emergency generators at HBLR Headquarters (i.e., a nanogrid) to distribute the power to required areas, including the installation of electrical poles, where necessary.

The current premise for the proposed Project is for the microgrid to generate enough power in a resilient manner to replace power that NJ TRANSIT would otherwise purchase through the commercial grid. While the operation of the microgrid would require facility maintenance and the purchase of natural gas for power generation, it is expected that these operational costs will be offset by energy sales.

1.3 BACKGROUND

Over the course of two years (2011-2012), New Jersey experienced three major weather events that had direct impacts on the state's existing commercial power grid. In August 2011, Hurricane Irene brought devastating rains, winds, and flooding that resulted in more than 2.2 million people throughout New Jersey being left without power for up to eight days. Later that year in October, a large early snowstorm disrupted power to more than a million people for up to seven days. Lastly, Superstorm Sandy caused major damage in New Jersey and New York in the fall of 2012. The storm hit the area with maximum sustained winds of 70 miles per hour (mph), and was accompanied by a storm surge into the coastal regions of both states. The loss of rail service in its entirety for nearly a week challenged all prior expectations of the system's resilience. It resulted in power outages to approximately 2.6 million utility customers over a period of 15 days (with some outages lasting much longer) and caused an estimated $50 billion in damage and an even greater impact to the economy. In the project area, during Superstorm Sandy, PSE&G customers lost power for up to eight days.

The public transportation infrastructure that connects Manhattan with northern New Jersey across the Hudson River, which is critical from security and economic standpoints, was severely affected in each of these cases. The ensuing power outages affected a large percentage of this region's public transportation, operated by NJ TRANSIT, the Port Authority of New York and New Jersey (PANY&NJ), and Amtrak. NJ TRANSIT services that were impacted included NJ TRANSIT's light rail, bus service and commuter rail, as well as ferry facilities in the region. Public transportation service remained disrupted for a protracted period of time after the storms, especially Superstorm Sandy. Power was restored to NJ TRANSIT's HBLR three days after Superstorm Sandy. Limited Northeast Corridor service was restored four days after the storm, and full service was restored eighteen days after Superstorm Sandy. Partial service to the Morris & Essex Line was restored fourteen days after Superstorm Sandy and full service restored 34 days after the storm. There have also been non-weather-related power outages that affected rail operations. It took NJ TRANSIT about 36 hours to restore service after Hurricane Irene in 2011.

The electric rail lines operating between New Jersey and New York City job centers are critical to the region's transportation network. Of the approximately 400,000 daily trans-Hudson New Jersey commuters traveling to jobs in New York City, roughly 36 percent or 143,000 depend on rail service. When Superstorm Sandy caused the loss of regional electric power, the system service was interrupted and travelers were stranded. Many tried to use substitute buses and ferries, but encountered hours of delay. NJ TRANSIT's and PANY&NJ's main New York City bus terminal (Port Authority Bus Terminal) operates at capacity and could not absorb the additional travelers that are normally carried by rail.

Therefore, and post-Superstorm Sandy, DOE partnered with the State of New Jersey to examine the use of microgrids to help supply electricity during future extreme weather events. This proposed Project is a result of that partnership and 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. While the DOE is not required to make a NEPA determination for the proposed Project, the DOE is a member of the Technical Advisory Committee (TAC), as described in Chapter 21, "Agency Coordination and Public Participation."

1.4 NEED FOR THE PROPOSED PROJECT

The need for the proposed Project is based, in part, on the vulnerability of the commercial electric power grid that serves NJ TRANSIT's and Amtrak's Northeast Corridor rail service. Power outages are occurring more frequently due to the nature of the existing centralized power distribution system and the intensity and frequency of severe weather events.

1.4.1 Severe Weather and the Existing Commercial Electric Grid

America's commercial electric grid comprises three smaller grids (referred to as "interconnections") that move electricity around the country. The Eastern Interconnection operates in states east of the Rocky Mountains, the Western Interconnection covers states between the Pacific Ocean and the Rocky Mountains, and the Texas Interconnection covers most of Texas. Severe weather is the number one cause of power outages in the United States, costing the economy between $18 and $33 billion annually in lost output and wages, spoiled inventory, delayed production and damage to grid infrastructure. Because the existing electric grid is so large and interconnected, it is vulnerable to widespread disruption from severe weather and physical or cyber-attacks (DOE 2014b). Microgrids are a leading technology in the effort to develop a more resilient electrical grid via the production of cleaner power in decentralized locations.

Currently, the existing commercial power grid relies heavily on mass burn power plants that are generally located far from population centers due to their size and environmental impact. The existing transmission and distribution grid distributes bulk power from the central power plants to load centers (i.e., transmission to substations) and from load centers to consumers (i.e., distribution via electrical lines). The existing network is somewhat inefficient between the power source and receivers, as significant energy losses occur in the transmission and distribution of electricity over relatively long distances. The existing commercial power grid is particularly vulnerable to severe weather resulting in, but not limited to, fallen trees, wildfires, and branches that can cause widespread power outages due to the extent of the large service territory and the corresponding length of the electrical lines.

There is also increasing concern that man-made events could put the existing commercial power grid at significant risk. Intentional attacks are a relatively new and emerging threat to power systems. A comprehensive study conducted by a special committee of the National Research Council and funded jointly by the National Academy of Science and the U.S. Department of Homeland Security entitled "Terrorism and the Electric Power Delivery System" (National Research Council 2012), provides compelling evidence that the cumulative threats to the electric power generating and transmission systems from physical and cyber-attacks could cause region-wide power outages that last days if not longer.

1.4.2 Frequency of Severe Weather Events Affecting NJ TRANSIT Service

As indicated above, Superstorm Sandy was only the latest of several major events affecting rail transportation in northern New Jersey. Hurricane Floyd in 1999, the Northeast Blackout in 2003[3], Hurricane Irene in 2011, the Halloween nor'easter following Hurricane Irene, and Tropical Storm Andrea in 2013 also caused major disruptions. Smaller but more frequent storms also caused outages that disrupted railroad operations. In the period between 2011 and 2013 alone, NJ TRANSIT recorded 49 power outages affecting rail operations just in the NJ TRANSITGRID TRACTION POWER SYSTEM service area alone (other than outages from either hurricane Irene and Superstorm Sandy), with a total duration of over 95 hours. This averages to 16 outages per year with an average duration of two hours, or about 32 hours per year of outages. The loss of rail service in its entirety for nearly a week challenged all prior expectations of the system's resilience. There is wide recognition that transportation resiliency in this critical area is a high priority.

1.4.3 Regional Mobility and Reliable Electric Power

Reliable electric power is essential to regional mobility. Along the Northeast Corridor, substitution of electric locomotives by diesel engines is not possible, as diesel trains are not permitted to operate in the Hudson River rail tunnels due to diesel exhaust. Furthermore, electric power is necessary to operate the signal system to safely route train movements, as well as ventilation equipment and pumps in the tunnels as required. Power is also necessary to support critical emergency activities in preparation for and recovery from flooding events, as maintenance facilities, pump stations, and emergency operation centers need to be energized to pump water from the tunnels and inspect equipment to return trains to revenue service. Despite the use of emergency diesel generators, which offer some degree of resilience (although extended use raises significant fuel availability and air quality concerns), the region's rail transportation system was largely shut down after Superstorm Sandy with substantial economic

[3] The Northeast Blackout of 2003 was not caused by a severe weather event. The blackout was due to infrastructure failure from a computer glitch as well as power lines that were compromised by overgrown trees.

consequences. The loss of rail service in its entirety for nearly a week challenged all prior expectations of the system's resilience.

1.5 PROJECT GOALS

The following goals and objectives were developed by NJ TRANSIT during the project scoping phase to guide the development and evaluation of the alternatives for NJ TRANSITGRID TRACTION POWER SYSTEM. These goals and objectives were first introduced to the public with publication of the Draft Scoping Document on January 7, 2016.

Project Goal No. 1: Provide a highly reliable parallel power source (to the existing commercial electric grid) to support the resilience of NJ TRANSIT's and Amtrak's public transportation services in northeastern New Jersey and New York.

- Utilize modern state-of-the-art resilient equipment;
- Incorporate advanced resilient safety technology;
- Minimize the length of electrical transmission lines to increase reliability; and
- Complement the projects in the NJ TRANSIT Resilience Program.

Project Goal No. 2: Achieve economic feasibility and cost-effectiveness.

- Generate power continuously (24/7);
- Minimize capital costs; and
- Minimize operating and maintenance (O&M) costs.

Project Goal No. 3: Expedite project delivery.

- Minimize construction risk;
- Minimize schedule risk; and
- Maximize efficiencies in the environmental review/permitting processes.

Project Goal No. 4: Minimize impacts to the natural and built environment.

- Minimize private property acquisition requirements to the extent feasible;
- Reduce direct and indirect sources of air emissions to the extent feasible;
- Minimize the need to construct in wetlands and open waters;
- Minimize impacts on parklands, open spaces and environmental conservation areas; and
- Minimize construction impacts to the extent feasible.

Chapter 2 Project Alternatives

2.1 INTRODUCTION

The project alternatives analyzed in detail in the DEIS include the No Action Alternative and one Build Alternative. NEPA requires consideration of the No Action Alternative to allow decision makers to compare the impacts of approving the proposed Project with the impacts of not approving the proposed Project. This chapter describes the two alternatives evaluated in this DEIS – the No Action Alternative and the Build Alternative (with a range of potential power generation outputs from 104MW to 140MW, depending on load and equipment configurations). As discussed below, the Build Alternative (also referred to as the preferred alternative) includes seven contiguous-linked project components ("Project Component A" through "Project Component G"). Where needed (i.e. crossing of the Hackensack River), design options were evaluated, and a preferred alternative was selected for these scenarios. Together, the seven segmented project components comprise the single Build/ Preferred Alternative. The two alternatives are described below in greater detail. This chapter also provides background information summarizing the project development, and the evaluation and screening process explaining how the Build Alternative was developed.

2.2 BUILD ALTERNATIVE

2.2.1 Overview

As stated in Chapter 1, the Build Alternative of the proposed Project would include a natural gas-fired generation plant, referred to as the Main Facility (Preferred Alternative Project Component A), with a net generation[4] of 104MW to 140MW, which would include using steam power generation from waste heat. Several design options have been evaluated for the microgrid. The preferred equipment configuration is a combined-cycle technology resulting in power generation capacity of 104MW to 140MW that combines five natural gas turbines and one steam turbine as per 20% design package, dated September 10, 2018. Approximately four acres of land at the Main Facility site is proposed for a solar panel facility with photovoltaic cells. Other design options of varying combinations of equipment and facility layouts (including all equipment housed inside one large building versus outside in individual enclosures) were considered. Ultimately, one Build Alternative was selected based on siting criteria and consideration of other criteria including capital cost estimates, Buy America requirements, and consistency with Project goals. The primary component of the Build Alternative would be the Main Facility, which would be in the Town of Kearny in Hudson County, New Jersey. It would be electrically connected to the Public Service

[4] Net generation is the amount of electricity generated by the power plant for consumer use. While the microgrid could have capacity to generate up to 140MW, a maximum of 125MW will be contributing to air emissions at any given time. The microgrid is designed with a higher generation capacity to provide consistent electrical loads and avoid fluctuations during islanded conditions.

Electric and 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, 7 days per week. When the existing commercial electric 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 supply demands. In the event any part or all of the microgrid is deactivated, the commercial grid would instantly provide the electric power flow to maintain operations. An interconnection at the Mason Substation would be the location of the "net metering." This constitutes electricity generated minus electricity consumed by NJ TRANSIT and Amtrak loads. 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:

- 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 a power 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 power connections to the individual traction power substations along the HBLR right-of-way.

In addition to providing traction power, the microgrid would also be designed to support some non-traction loads. Providing power for these non-traction loads would not require additional or new infrastructure, beyond what is described and evaluated in this DEIS. The non-traction loads would include:

- 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.

Figures 1-1 and 1-2 in Chapter 1, "Purpose and Need," highlight 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. Newark, New Jersey, and Manhattan, New York, represent areas with very high transit dependency for both work and non-work trips.

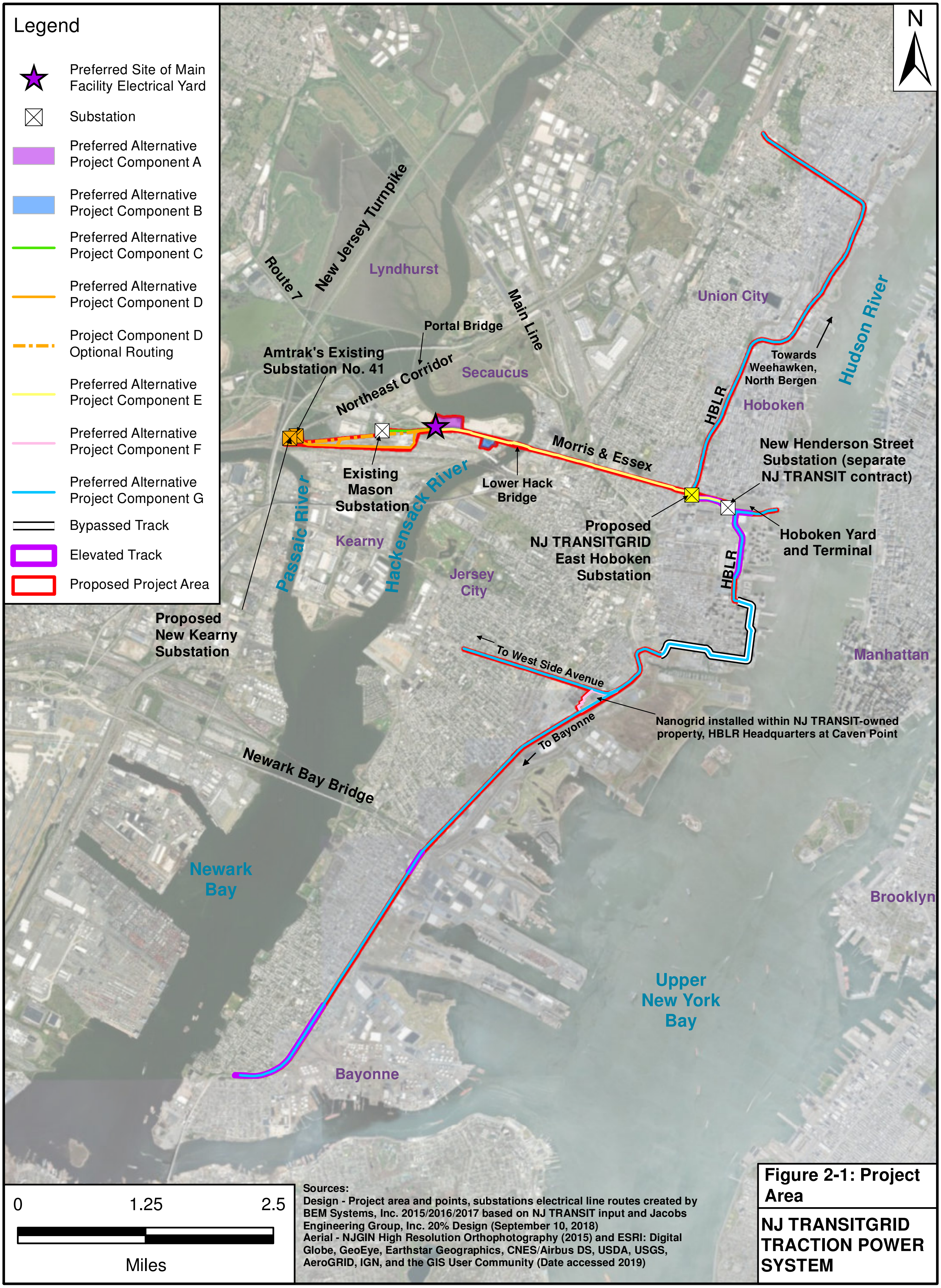
During initial studies in 2013 and 2014, the size of the Main Facility was estimated based on historic electrical demand data and by considering the unique aspects of traction power for rail service, since it represents the vast majority of the peak load requirement. Based on these conceptual estimates, a net generation capacity of approximately 104MW would be needed for the core service territory to overcome the frequency fluctuations and negative phase sequence in the electrical system (Sandia 2014). The actual traction power loads are less than 104MW; however, the Main Facility's generation capacity must be great enough to account for intra-hour peaks and down time for equipment maintenance, as well as provide stable voltage and frequency as load changes occur.

NJ TRANSIT has completed the 20% design package, dated September 10, 2018, for the microgrid. While the design details of the Main Facility will continue to be refined during subsequent engineering stages, the environmental analyses in this document evaluate a reasonable worst-case impact scenario of the equipment identified in the 20% design package. To provide for conservative environmental analyses, this DEIS assumes the microgrid would include five natural gas turbines and one steam turbine with an output of 104MW to 140MW of mechanical power operating at maximum capacity. This conservative assumption accounts for the potential for higher estimates of hourly demand and the specification of additional equipment that would allow for uninterrupted service while maintenance is performed on the turbines.

The Build Alternative includes the Main Facility as well as other components required for the power distribution infrastructure needed to support the core service territory—including several substations, various electrical lines, and other elements that extend throughout the project site. For purposes of this DEIS, the Build Alternative is described as "Project Component A" through "Project Component G" (see Figure 2-1), as defined in the list below. Project Components are detailed in Sections 2.2.2 through 2.2.8 of this chapter.

- Project Component A – Main Facility
- Project Component B – Natural Gas Pipeline Connection
- Project Component C – Electrical Lines to Mason Substation
- Project Component D – Electrical Lines and New Kearny Substation
- Project Component E – Electrical Lines and New NJ TRANSITGRID East Hoboken Substation
- Project Component F – Connection to HBLR South
- Project Component G – HBLR Connectivity

At the Main Facility, the primary impervious surface will be at the location of the Main Facility Building (Operations and Control Building) and associated parking. The remainder of the parcel will be covered with gravel or crushed rock, maintaining the current pervious surface. This includes the substation,



Sources:
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 2-1: Project Area

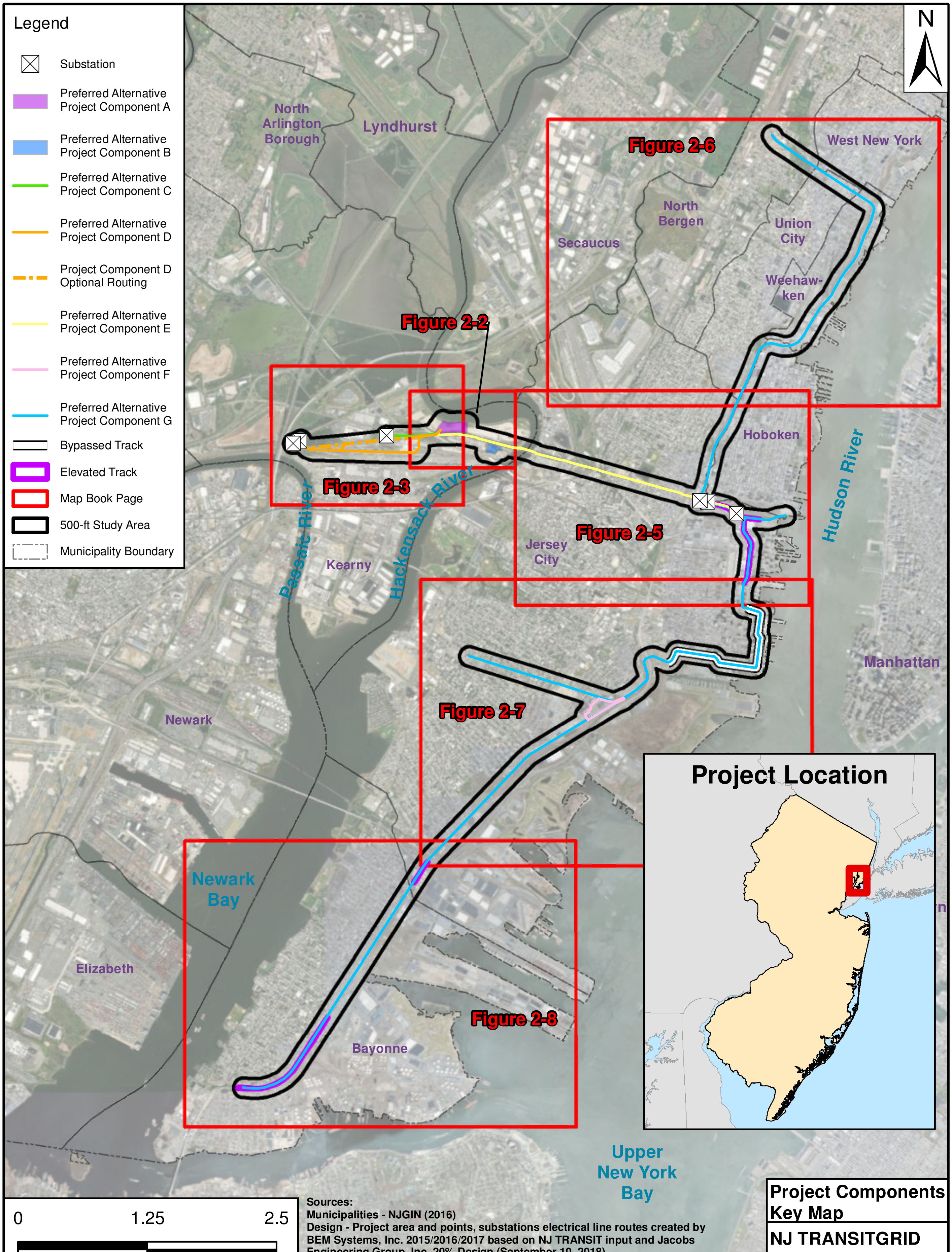
NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure2_1_ProjectArea.mxd combustion turbine generator yard, and the detention basin underneath the solar panels. As discussed in this document, the limit of disturbance (LOD) for the New Kearny Substation is a known area of 1.7 acres in Cedar Creek Marsh South. The NJ TRANSITGRID East Hoboken Substation and the nanogrid will be constructed on previously developed land and will therefore not increase impervious surface.

2.2.2 Preferred Alternative Project Component A—Main Facility

The preferred site for the Main Facility is in the Town of Kearny, Hudson County, New Jersey and was selected during a siting analysis completed in 2015 (see Figure 2-1 and Appendix A, "Site Screening Analysis"). The Main Facility site is part of a large tract of land currently owned by the Hudson County Improvement Authority (HCIA) and commonly known as the Koppers Koke Site, which lies within the Koppers Coke Redevelopment Area (the Redevelopment Area) (NJ Meadowlands Commission [NJMC] 2013). The rationale for the selection of the Main Facility site is presented below in Section 2.4, "Background on Alternatives Development, Evaluation and Screening." The Meadowlands Regional Commission (MRC), which resides within the New Jersey Sports and Exposition Authority (NJSEA), is seeking to encourage brownfield redevelopment on this parcel. HCIA has elevated portions of the Koppers Koke Site above the Federal Emergency Management Agency (FEMA) Preliminary Base Flood Elevation (BFE) which was determined from the Preliminary Flood Insurance Rate Map (FIRM) dated July 2, 2018 (panel number 34003C0332J). The BFE for Preferred Alternative Project Component A is +8 feet North American Vertical Datum of 1988 (NAVD88)[5] and the NJ TRANSIT's Design Flood Elevation (DFE) is BFE + 2.5 feet, or +10.5 feet NAVD88 (NJ TRANSIT 2014). An additional 2.5 feet is added to adjust for relative sea level change (SCL) expected over the 50-year Project life at the preferred location. The Sea Level Rise (SLR) calculation was obtained from the NOAA online SLC calculator using the National Oceanic and Atmospheric Administration (NOAA) Intermediate-High scenario, which projects an increase in sea level of 2.5 feet over the next 100 years. To this value a minimum of +1.0 foot, required by the FTA for construction in the coastal zone (Emergency Relief Program, Interim Final Rule), was added, as well as an additional +0.5-foot factor of safety that acknowledges the criticality and cost of the state's railroad infrastructure, for a final DFE of +12 feet NAVD88. The planned elevation of Project Component A is greater than +25 feet NAVD88, so complies with the NJ TRANSIT DFE as well as FTA's Emergency Relief Program 49 U.S.C. 5324 section 4.2.3 Floodplain Management, as discussed in Section 2.3.2 below. The proposed Project would use approximately 26 acres total that NJ TRANSIT is acquiring as part of unrelated litigation within the Redevelopment Area for the proposed Project, consisting of two parcels: a 20-acre parcel located within the Koppers Koke Site that was prepared for development by HCIA, and a six-acre parcel on Fish House Road. The Main Facility would occupy approximately 20 acres within the Koppers Koke Site as shown on Figure 2-2 and would include approximately 32,000 square feet of working and office space (Preferred Alternative Project Component A). As discussed in the next section, the six-acre

[5] North American Vertical Datum of 1988 (NAVD 88) is the vertical control datum of orthometric height established for vertical control surveying in the United States. It consists of a leveling network on the North American Continent, ranging from Alaska, through Canada, across the United States, affixed to a single origin point on the continent.



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Project Components Key Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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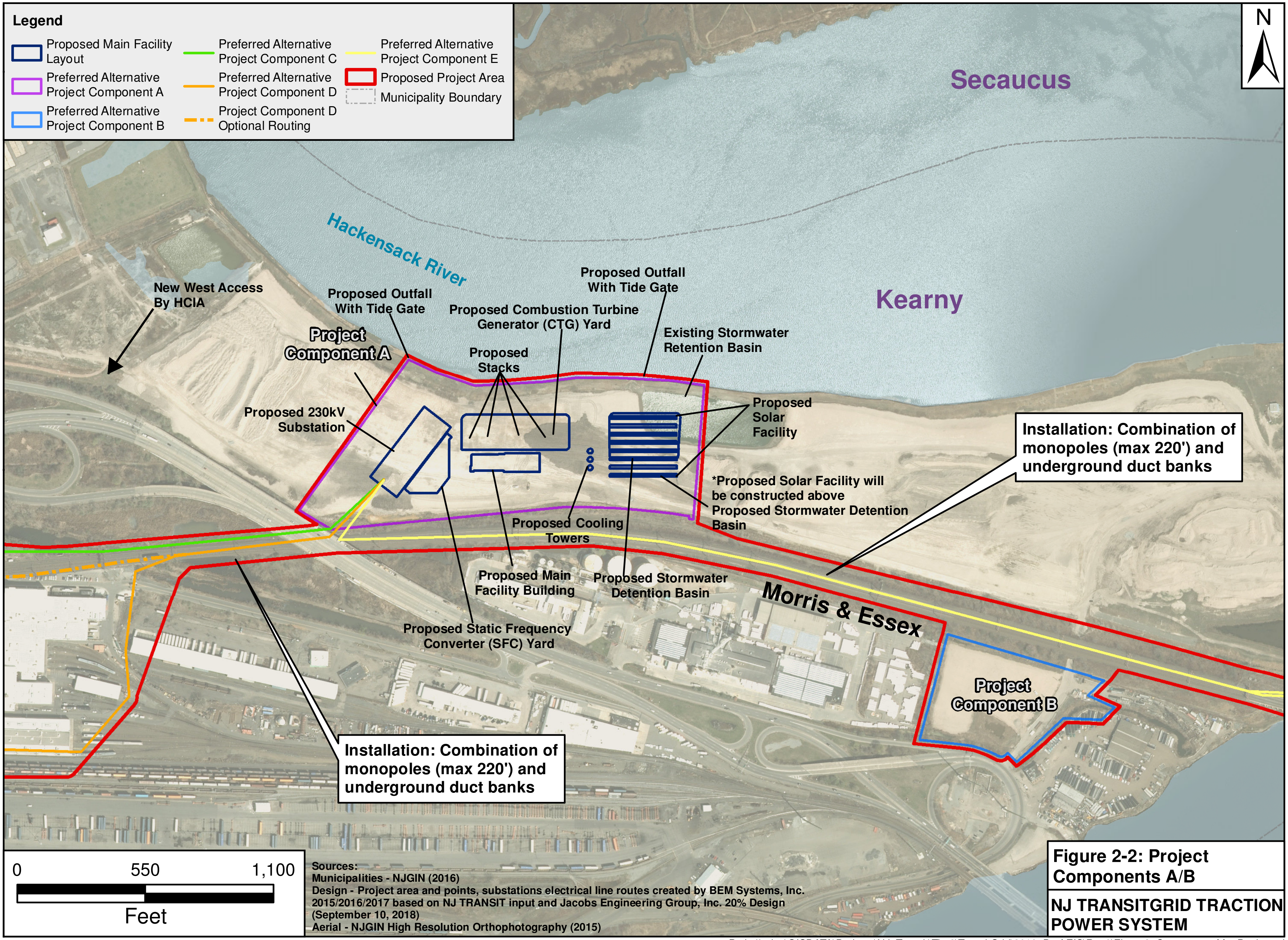

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Figure 2-2: Project Components A/B

NJ TRANSITGRID TRACTION POWER SYSTEM

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parcel south of the Morris & Essex Line would be used for natural gas connection and metering (Preferred Alternative Project Component B).

The Main Facility building would include a maintenance shop, locker rooms, control room, process equipment, office facilities, and other general-use spaces. Adjacent to the Main Facility building, a combustion turbine generator (CTG) yard containing five natural gas turbines, two of which will also include heat recovery steam generators (HRSG), would be constructed. Five ventilation stacks, approximately 10 feet in diameter and a maximum of 150 feet high, would be constructed within the CTG yard for the gas turbine exhaust. A substation would be constructed in the proximate vicinity of the CTG yard and the Main Facility building to connect the generated power to the required voltages and frequencies and will include static frequency converters (SFC). The Main Facility layout is shown in Figure 2-2. Construction of the Main Facility building foundation would include pile driving to rock, roughly 100 feet below ground surface, using a double-casing technique to prevent migration of contaminated materials and forming and casting concrete floor slabs and equipment pads. During construction, specific measures will be in place to prevent worker exposure to or spreading of existing contamination. Additional details on the construction methods and effects are discussed in Chapter 17, "Construction Effects."

NJ TRANSIT has selected the following equipment configuration as the most feasible based on cost, Buy America (49 Code of Federal Regulations [CFR] § 661 [2012]) compliance, revenue potential and consistency with the proposed Project's goals. During concept verification, several options were evaluated to maximize transit operations within the constraints of the capital budget and air permit limitations (Jacobs 2017a).

The Build Alternative would be a combined-cycle natural gas turbine plant, which would supplement the power output with a steam turbine generator utilizing the waste heat from the gas turbines without additional fuel input. The conceptualized steam turbine capacity would be 14MW to 18MW total (mechanical power) and would have minimal environmental impacts. The Build Alternative would have the following main components:

- Five gas turbines (21MW to 25MW each);
    - Two of these will be connected to HRSGs;
- One steam turbine (14MW to 18MW);
- Two emergency "black start" reciprocating engines (not to exceed 2.5MW each); and
- Solar facility generating approximately 0.6MW occupying approximately four acres on the Main Facility site.

For comparison, a simple-cycle power plant uses only the gas turbines and/or reciprocating engines to generate electricity. In a simple-cycle power plant, the hot exhaust from power generation equipment is released into the atmosphere. In a combined-cycle plant, the excess heat is used to convert water to steam for use in a steam turbine generator. In the Build Alternative, the reciprocating engines would only serve as “black start” generators, which would allow for start-up of the Main Facility without reliance on external electricity. In a combined-cycle plant, cooling towers would be used to condense the steam in the steam turbines and expel the remaining low-grade heat to the atmosphere. Federal and New Jersey regulations impose stringent emissions control technology requirements on power generation facilities. Federal regulations applicable to a new power generating facility include, but are not limited to, the Environmental Protection Agency’s (EPA) Title V and Nonattainment New Source Review (NNSR)/Prevention of Significant Deterioration (PSD) permitting requirements, New Source Performance Standards (NSPS) and Maximum Achievable Control Technology (MACT) standards. The EPA has delegated authority to administer these programs to the New Jersey Department of Environmental Protection (NJDEP). The New Jersey Administrative Code (N.J.A.C.) includes State of the Art (SOTA) criteria and Reasonable Available Control Technology (RACT) requirements. Other regulations found in the N.J.A.C. that may be applicable to the proposed Project include Title 7, Chapter 27, Subchapters 8 (Permits and Certificates for Minor Facilities and Major Facilities without an Operating Permit), 18 (Emission Offset Rules) and 22 (Title V Operating Permits). Selective Catalytic Reduction (SCR) and oxidation catalyst systems would be installed on the plant to reduce the levels of pollutant emissions to SOTA levels.

As shown on Figure 2-2, approximately four acres of the Main Facility site would be utilized for a solar (photovoltaic cells) panel facility. The solar panels would generate approximately 0.6MW (640 kilowatts [kW]) of additional power. Since the power generated from the solar panels is relatively low in comparison to the power generated by the microgrid, it is anticipated that solar power would supplement power needed to run the Main Facility. This solar power would not reach the commercial grid, even though it could technically be connected to the commercial grid via the microgrid. The solar panels would be installed over the proposed detention basin, discussed below. There would be enough clearance over the gravel surface of the detention basin for maintenance access, and the panel tops would be no more than 35 feet above the gravel surface of the detention basin.

<u>Other On-Site Equipment</u>

In addition to the Main Facility, project substations, transformers, frequency converters, cooling towers (approximately 31 feet above grade and approximately 37 feet above grade to top of stack), and other equipment would be built on the Main Facility site to accommodate the different power needs of Amtrak’s Northeast Corridor and NJ TRANSIT’s commuter and light rail services. Other major on-site facility components would include tanks and equipment for ammonia (used for emissions controls), and service and fire water. Security fencing and other security measures would be installed at the site.

<u>Route 7 Access</u>

The Main Facility site would be connected to Route 7 via an easement near the intersection with the Belleville Turnpike. In the project design, NJ TRANSIT has proposed a driveway for access to the Main Facility site. The driveway would be connected to westbound lanes of Route 7 and would provide access along the southwest boundary of the Koppers Koke site to the Main Facility footprint. Separately from the proposed Project, HCIA and its contract purchaser has presented a concept application submission to the New Jersey Department of Transportation (NJDOT) to allow ingress and egress from the Redevelopment

Area to Route 7 for large vehicles (e.g., tractor trailers). In the event that the HCIA's roadway access improvements are delayed, incoming traffic related to the proposed Project could enter the Main Facility site via an existing west access point on the Koppers Koke parcel. Outbound traffic generated by the Main Facility could be routed to westbound Route 7 via the west access point. In this event, NJ TRANSIT would acquire appropriate easements from HCIA for such access and ensure the appropriate access permits are secured from NJDOT.

Water

As discussed in Chapter 15, "Utilities," the Main Facility site contains no sanitary sewers or water service. The Main Facility would include a closed loop system for driving the steam turbine, which would be sourced from the municipal water supplier, Suez Water. There would be two water supply systems piped within the building: a domestic water system for employee day to day use and a process water system. Water usage for the microgrid's natural gas-fired turbines would require water for cooling purposes, which would be further purified with a reverse-osmosis system. Most of the water use for the proposed Project is associated with the steam-driven turbine's cooling water. The 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 water demand would be approximately 850 to 1,000 gallons per minute (gpm), which corresponds to 1.3 million gallons per day (MGD), for plant operations. This is expected to vary throughout the year. Domestic water would be supplied to toilet rooms, janitor's closets, water laboratory fixtures, break room sinks and fire suppression systems. Domestic water demand is estimated at 102 gpm. Suez Water currently has spare capacity of approximately 3MGD and would therefore accommodate the water needs for the Preferred Alternative. NJ TRANSIT proposes to install a 12-inch water supply line, with a connection to an existing 42-inch main water line which is owned by the Town of Kearny. The new supply line would exit the Preferred Alternative Project Component A footprint near the southwest corner and travel southwest, following a route generally parallel to the Morris & Essex Line. The new connection would be located south of Route 7, but on the north side of the Morris & Essex Line. No surface or ground water will be used for water supply under the Preferred Alternative.

Waste Water/Sewer Supply

All waste water from the facility will be discharged to the municipal sanitary sewer system. 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. Water temperatures discharged from the cooling towers will be low (under 140°F), so the water can be drained 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 industrial waste system will collect waste water from the floor drains in the machinery area, hub drains near the Heat Recovery Steam Generators (HRSGs), and elevator shaft sump pumps, which will be used during emergencies. 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. Sanitary and industrial waste waters will be directed to a treatment plant operated by the Passaic Valley Sewerage Commission (PSVC). NJ TRANSIT proposes to install one sanitary pump station as part of Preferred Alternative Project Component A and a new eight-inch sanitary sewer force main line that would tie into an existing sanitary sewer pump station, operated by Kearny Municipal Utilities Authority (KMUA). The new sanitary sewer line would exit the Preferred Alternative Project Component A footprint near the southwest corner and travel northwest, along the boundary of the Koppers Koke site and parallel to Route 7 before cutting over to the southwest, under Route 7 and under the Newark-Jersey City Turnpike. The proposed tie in is located near the Mason Substation on the Newark-Jersey City Turnpike.

Stormwater Management

The existing stormwater basin was designed as a retention basin for use during remediation activities, including placement of the processed dredge material (PDM). NJ TRANSIT proposes to fill in the portion of the existing retention basin that is within the 20-acre parcel (Preferred Alternative Project Component A) as a feature of the proposed Project, since the location of the existing stormwater outfall is not suitable for use by the proposed Project. Stormwater on the 20-acre parcel is proposed to be collected in a new detention basin under the solar panel facility (discussed above) prior to discharge through two proposed stormwater outfalls. One new outfall is proposed near the northeast corner of the property (immediately north of the detention basin and solar panel facility) and another outfall is proposed near the northwest corner of the 20-acre parcel. The proposed stormwater system would include three stormwater pre-treatment structures; two near the detention basin and solar panel facility and one near the southwest corner of Preferred Alternative Project Component A. The detention basin is designed to comply with the regulations in the NJDEP Stormwater Best Management Practices Manual and NJDEP Stormwater Management Rule (N.J.A.C 7:8) 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. Stormwater managed onsite has been designed to comply with water quality and water quantity requirements in accordance with Rule N.J.A.C 7:8 and will provide 80 percent Total Suspended Solid (TSS) removal prior to being discharged to the Hackensack River.

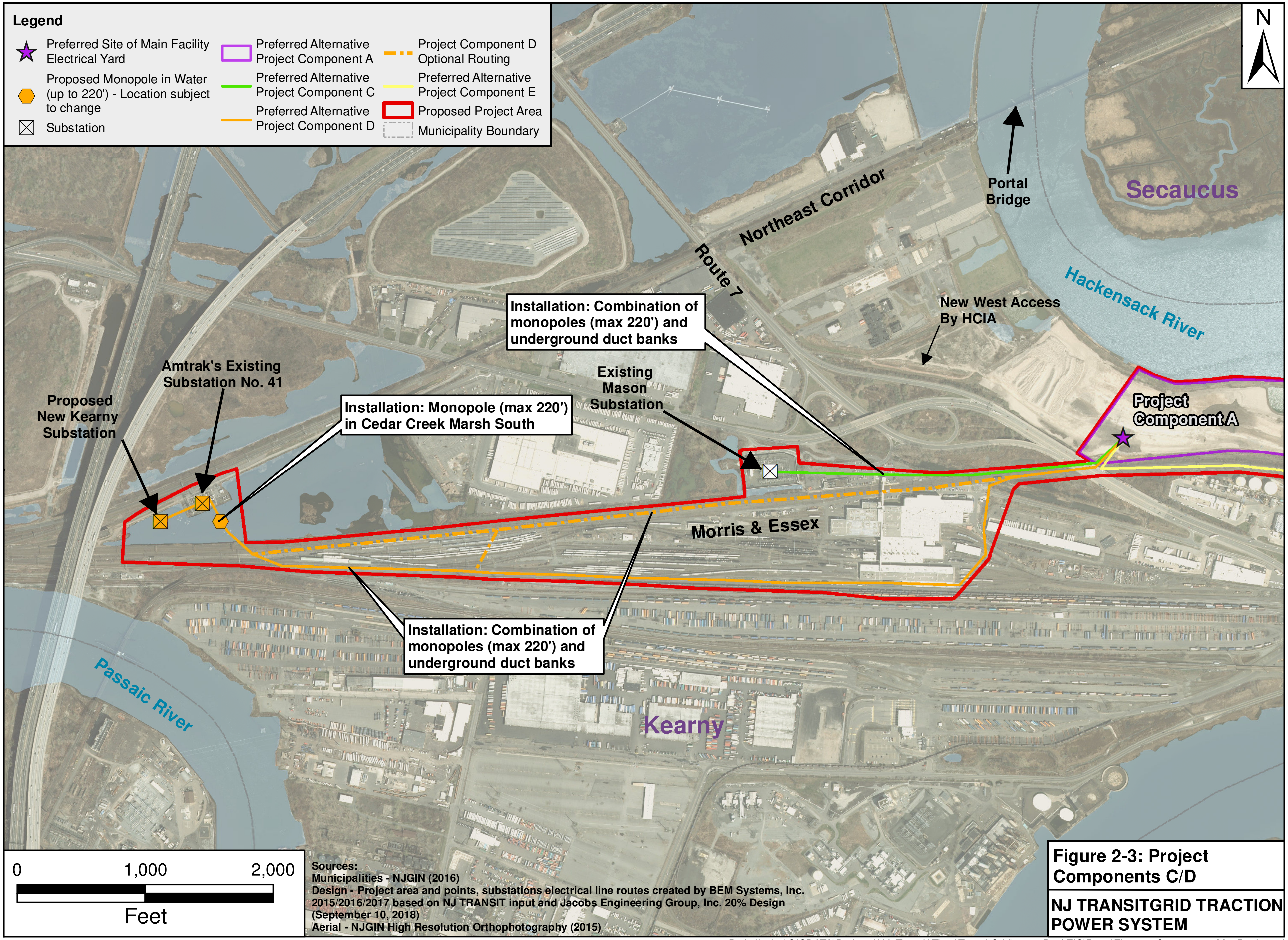
2.2.3 Preferred Alternative Project Component B—Natural Gas Pipeline Connection

The Main Facility would utilize natural gas as fuel for its combustion turbines and black start engines. The six-acre parcel that would be used for the gas connection to the commercial natural gas supply lines, is located to the south of the Morris & Essex Line within the Redevelopment Area (see Figure 2-2). This parcel is currently owned by HCIA, and would be acquired by NJ TRANSIT, as part of unrelated litigation within the Redevelopment Area, described further below. Three natural gas pipelines currently traverse the parcel: two of the existing natural gas pipelines are owned by PSE&G (16- and 20-inch diameter pipes) and the third (a 12-inch diameter pipe) is owned by The Williams Company (formerly known as TRANSCO). For the proposed Project, natural gas would be delivered via a new interconnection with one of the existing gas pipelines that currently traverse this parcel. Historically, even during extended grid outages, natural gas pipeline supply pressure was maintained. Natural gas pipelines are generally compressed using in line (natural gas burning) compressor station sand not subject to electrical grid disturbances. For the stations that are electrically driven for compression, the PJM Interconnection (regional) grid restoration (black start) plans prioritize the compressor stations over any other loads. The existing natural gas lines under consideration for connection to the Main Facility have natural gas back-up generators. Therefore, the risk of loss of natural gas coincident with loss of grid traction power is deemed to be very low. From the Main Facility site, the new gas line would extend eastward along the southern border of the Koppers Koke Site in a permanent easement, run beneath the Morris & Essex Line in a two-foot diameter steel casing, and southward within the six-acre parcel to connect to the existing pipelines. A new metering station would be installed. The total length of the pipeline extension would be approximately 0.5 miles. NJ TRANSIT would develop an interconnection agreement with The Williams Company and/or PSE&G. A gas metering station enclosed in a small structure, security fencing, and other security measures would be installed on the six-acre parcel.

2.2.4 Preferred Alternative Project Component C—Electrical Lines to Mason Substation

Preferred Alternative Project Component C (see Figure 2-3) would comprise electrical lines (230 kilovolt [kV], double-circuit, 60 hertz [Hz]) along railroad right-of-way between the Main Facility site and Mason Substation to supply power to the Morris & Essex Line. It would extend approximately 0.7 miles in length. The preferred option for installation of these electrical lines is a combination of new monopoles (up to 220 feet tall where required for adequate clearance from other infrastructure) and underground duct banks. For monopoles greater than 200 feet, coordination with Federal Aviation Administration (FAA) guidelines is required to determine if lighting is required for aviation safety. 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 shafts roughly two feet in diameter are proposed to be drilled with an auger to a depth of 95 feet with permanent steel casings. Smaller monopoles would have a single shaft drilled with an auger to a depth of up to 70 feet for the foundation. 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. During construction, specific measures will be in place to prevent worker exposure to or spreading of existing contamination. These measures will be documented in a Materials Management Plan (MMP) and will address contaminated soils and potentially contaminated groundwater. Additional construction details for the new monopoles and duct banks as well as measures to prevent exposure to or spreading of existing contamination are discussed in Chapter 17, “Construction Effects.”

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. 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)



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Aerial - NJGIN High Resolution Orthophotography (2015)

Figure 2-3: Project Components C/D

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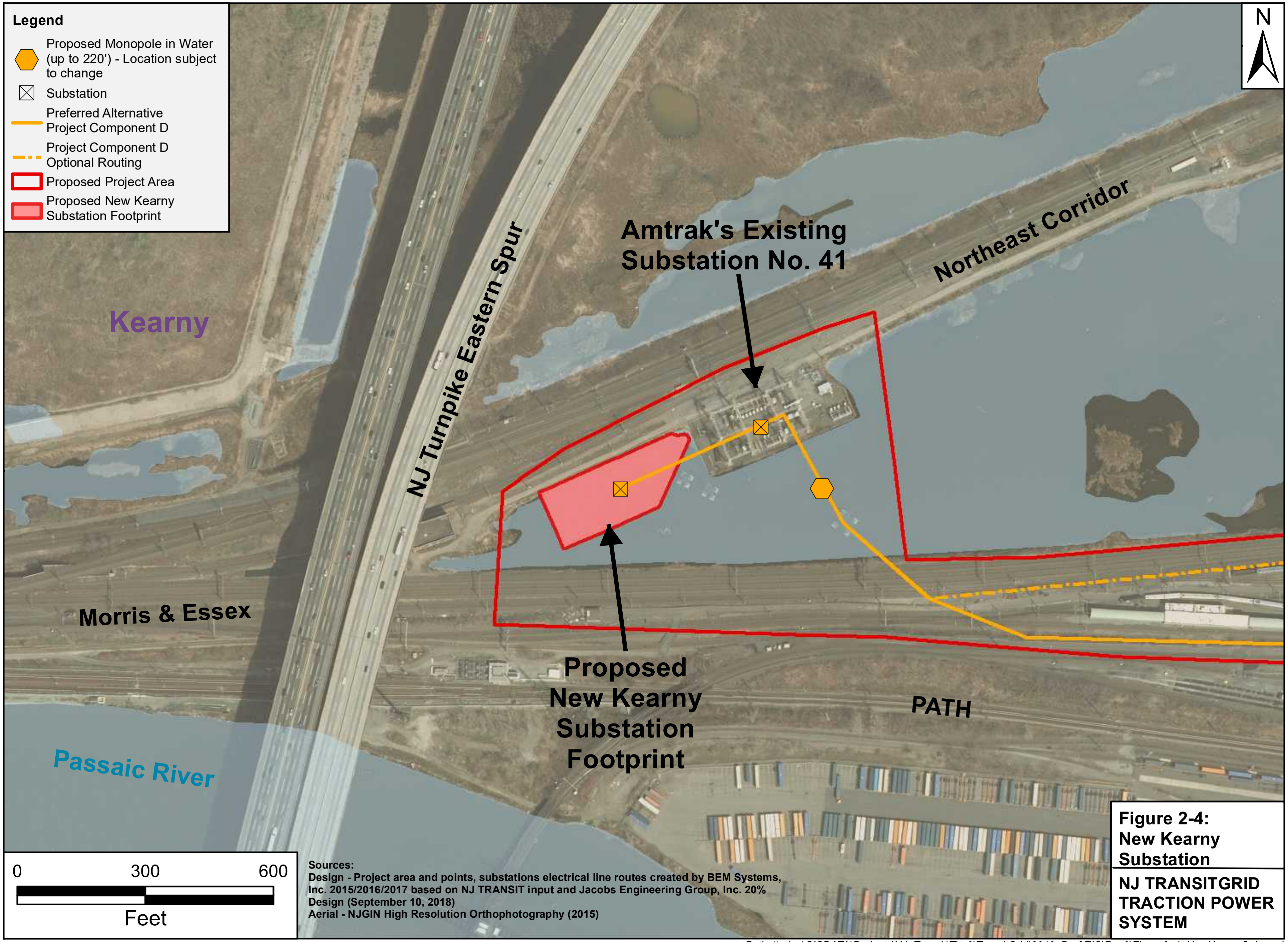
and underground (duct banks) options. The third design option was selected as the preferred alternative based on various site-specific factors, such as access, site constraints, localized geology, areas of known contamination and documentation/survey of existing utilities (both overhead and underground) (see Figure 2-3). Construction impacts to existing utilities may result in interruptions to public utilities and/or transportation service delays and therefore, the project has been designed to avoid these interruptions.

2.2.5 Preferred Alternative Project Component D—Electrical Lines and New Kearny Substation

Amtrak's existing Substation No. 41 (see Figure 2-3) provides overhead catenary power to the Northeast Corridor in the area of the Portal Bridge. It is connected electrically between Substation No. 40 (Waverly) and Substation No. 42 (Hackensack), which provides power to the tracks connecting New Jersey and Manhattan. Substation No. 41 is part of the Amtrak power transmission and distribution system that energizes the traction power system along with power for signals, switches, etc. The existing Substation No. 41 is located on a concrete/fill pad adjacent to open water and is subject to flooding and damage from high water during powerful storm events, such as Superstorm Sandy, due to its location adjacent to Cedar Creek Marsh South. A new traction power substation (referred to hereafter as the new Kearny Substation) would be built to replace the existing Substation No. 41 functions and accommodate the new connections to the Main Facility to support Northeast Corridor service. The new Kearny Substation would be located within Amtrak property adjacent to the existing Substation No. 41. The new Kearny Substation would require the construction of an elevated platform on concrete piers to support the new equipment (see Figure 2-4). While the existing lattice structure at Substation No. 41 would remain in place, the equipment at Substation No. 41 would be decommissioned and removed. The existing Substation No. 41 concrete/fill pad would remain in place and continue to be owned by Amtrak and may be used for ancillary railroad activities. The electrical lines from the Main Facility would be built within the existing NJ TRANSIT right-of-way (through the Meadows Maintenance Complex [MMC] as discussed further below) to connect to conductors supported by the existing lattice structure. These conductors (138kV, single phase, 25Hz) would remain connected to the eastbound Northeast Corridor toward Substation No. 42. The existing conductors also would connect to new conductors on the lattice structure at the new Kearny Substation, which would in turn connect to the incoming lines from Substation No. 40. Because the Amtrak owned facility is included in the proposed Project, the Federal Railroad Administration (FRA) is included as a Participating Agency in the Technical Advisory Committee (TAC), as described in Chapter 21, "Agency Coordination and Public Participation."

The electrical line from the Main Facility to the new Kearny Substation (Figure 2-3) would be routed through the existing rail line and through the rail yard in the area of the MMC and the Morris & Essex Line. The Morris & Essex Line in this area is a highly congested utility corridor. To avoid the existing utilities, under the preferred alternative, the electrical line for Project Component D would 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 (total of 1.47 miles) (see Figure 2-3 for Preferred Alternative Project Component D). As an optional routing, the electrical line could travel along the Morris & Essex right-of-way until it reaches Cedar Creek Marsh South (total of 1.35 miles). Due to a number of



Sources:
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)

Figure 2-4: New Kearny Substation

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Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure2_4_NewKearnySub.mxd factors, including access, existing local utilities and geology, the electrical line could travel south briefly from the Morris & Essex Line before reaching the marsh (total of 1.39 miles) as shown on Figure 2-3. The preferred alternative for Project Component D is the electrical line departing from the Morris & Essex Line before Mason Substation and traveling south around the MMC and west along the MMC access rail to Cedar Creek Marsh South. Once it reaches Cedar Creek Marsh South, the electrical line would continue to the existing Amtrak Substation No. 41 gantry and on to the location of the new Kearny Substation, within NJ TRANSIT and Amtrak rights-of-way.

Similar to Project Component C, the preferred alternative for construction of this electrical line is a combination of new monopoles up to 220 feet tall and in underground duct banks. 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 shafts roughly two feet in diameter are proposed to be drilled with an auger to a depth of 95 feet with permanent steel casings. Smaller monopoles would have a single shaft drilled with an auger to a depth of up to 70 feet for the foundation. 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. During construction, specific measures will be in place to prevent worker exposure to or spreading of existing contamination. These measures will be documented in an MMP and will address contaminated soils and potentially contaminated groundwater. Additional construction details for the new monopoles and duct banks as well as measures to prevent exposure to or spreading of existing contamination are discussed in Chapter 17, “Construction Effects.”

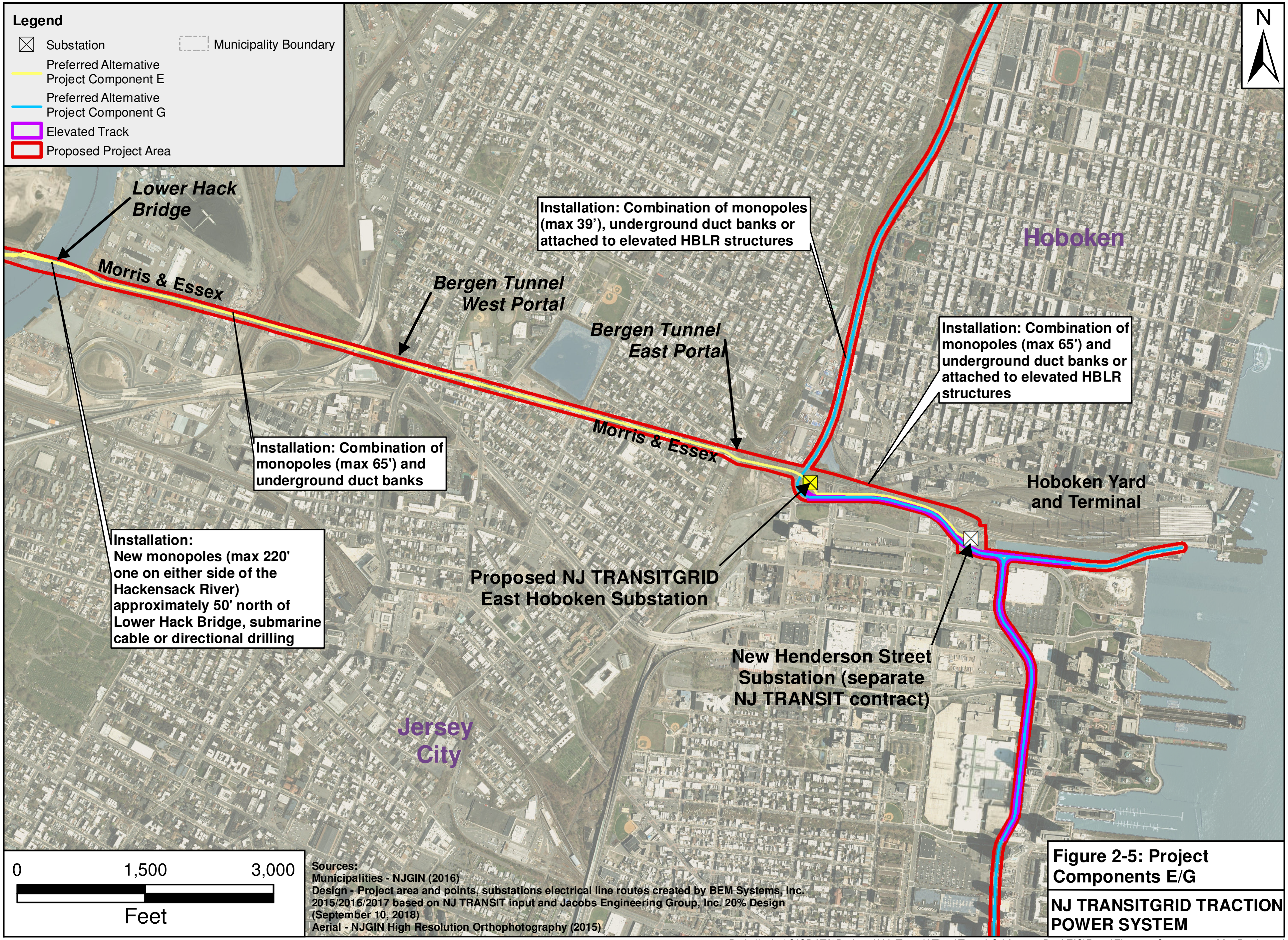
This DEIS evaluated two methods for installation of electrical lines on monopoles up to 220 feet tall or installed via underground cables in duct banks that extend from the Main Facility to the new Kearny Substation. The three design options evaluated were: 1) all electrical lines installed overhead 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 alternative 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 new Kearny Substation would have a final ground surface level above the anticipated 500-year flood elevation to meet NJ TRANSIT’s DFE of +13.9 feet NAVD88) (NJ TRANSIT 2014). The planned elevation of the new Kearny Substation (Project Component D) is +15.5 feet NAVD88, so exceeds the NJ TRANSIT DFE and meets the required minimum elevation based on FTA’s Emergency Relief Program 49 U.S.C. 5324 section 4.2.3 Floodplain Management. Construction details for these features are discussed in Chapter 17, “Construction Effects.”

2.2.6 Preferred Alternative Project Component E—Electrical Lines and New NJ TRANSITGRID East Hoboken Substation

Preferred Alternative Project Component E includes an electrical line that extends from the Main Facility eastward to Henderson Street Substation (see Figures 2-2 and 2-5). A new NJ TRANSIT substation (referred to as the NJ TRANSITGRID East Hoboken Substation) will be constructed on NJ TRANSIT property between the Morris & Essex Line, HBLR, and Jersey Avenue to serve the Henderson Street Substation and for HBLR resiliency. This approximately 3-mile electrical line will remain within the Morris & Essex Line's right-of-way and will support HBLR service and Hoboken Terminal and Yard. Preferred Alternative Project Component E electrical lines include 27kV 60 Hz medium voltage feeders to the new NJ TRANSITGRID East Hoboken Substation and 13kV voltage feeders for 0.28 miles to the new Henderson Street Substation. The electrical line would cross the Hackensack River, proceed through a 0.8-mile tunnel (the southern tube of the existing Bergen Tunnels, which is part of the Morris & Essex Line), and connect the new NJ TRANSITGRID East Hoboken Substation to the Henderson Street Substation. From the NJ TRANSITGRID East Hoboken Substation, the circuit would be divided with a feeder headed north on the HBLR easement to feed the HBLR north substations, and a feeder headed east connecting to the Henderson Street Substation to feed Hoboken Terminal and Yard. Similar to Project Components C and D, the preferred alternative for construction of this electrical line is a combination of new monopoles, attachment to existing infrastructure, underground duct banks and an interior (aboveground) duct bank within the Bergen Tunnels. New monopoles in the Town of Kearny may be up to 220 feet tall; the monopoles east of the Hackensack River would have a maximum height of 65 feet, with one exception for the Hackensack River crossing. The preferred option is for the electrical line to be run aerially across the Hackensack River, which would require two monopoles (maximum height of 220 feet) on either side of the Hackensack River (i.e., one in Kearny and one in Jersey City), approximately 50 feet north of the Lower Hack Bridge. The eastern monopole of the river crossing would be the only monopole in Jersey City that exceeds 65 feet above top of rail (TOR) along Preferred Alternative Project Component E. Construction details for these features are discussed in Chapter 17, "Construction Effects."

This DEIS evaluated three methods for installation of electrical lines on monopoles (maximum heights described above), installed via underground cables in duct banks or attachment to existing infrastructure (i.e., HBLR elevated tracks and bridges) that extend from the Main Facility to Henderson Street Substation. 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. For monopoles up to 220 feet tall (west of the Hackensack River) with a diameter greater than four feet, at each monopole location four shafts roughly two feet in diameter and up to 95 feet deep would be drilled with an auger and installed with permanent steel casings. For monopoles east of the Hackensack River (except for the monopole for aerial crossing of the Hackensack River), the installation process would be the same as described above, but the monopole heights would be no taller than 65 feet, so the footing would be proportionately smaller and shallower (e.g., up to 4-foot diameter, with up to a 70-foot foundation depth). 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



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)

Figure 2-5: Project Components E/G

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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. During construction, specific measures will be in place to prevent worker exposure to or spreading of existing contamination. These measures will be documented in an MMP and will address contaminated soils and potentially contaminated groundwater. Additional construction details for the new monopoles and duct banks as well as measures to prevent exposure to or spreading of existing contamination are discussed in Chapter 17, “Construction Effects.”

The third design option was selected as the preferred alternative 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.

In addition, where the electrical line must cross the Hackensack River, three design options were evaluated in this DEIS 1) aerial crossing approximately 50 feet north of the Lower Hack Bridge, 2) through a submarine cable along the river bottom, or 3) directionally drilled underneath the river bed. The preferred alternative for the Hackensack River crossing is the aerial crossing option, 50 feet north of the Lower Hack Bridge. The other two options have been retained in this DEIS and potential impacts analyzed in case the preferred alternative is determined to be infeasible. The final determination for Hackensack River crossing will be made in late design phases by the Design, Build, Commission (DBC) contractor. Construction impacts for the three river crossing alternatives are described in Chapter 17 “Construction Effects.”

2.2.7 Preferred Alternative Project Component F—Connection to HBLR South

Connectivity to the southern portion of HBLR consists of a smaller “nanogrid” that would be installed on NJ TRANSIT-owned property at the HBLR Headquarters on Caven Point Avenue in Jersey City. The nanogrid would consist of two approximately 2MW generators driven by natural gas reciprocating engines. It will supply power to the southern half of the HBLR (approximately 8.66 rail miles) during emergencies. The purpose of siting a nanogrid in the HBLR Headquarters is to avoid placement of electrical lines through historic and cultural resources within a 1.6-mile section of the HBLR in Jersey City. The nanogrid generators are spark gas ignited reciprocating engines, only designed to operate in emergency conditions. As such, they would be able to run for the duration of any emergency condition without the need to shut down for maintenance. During normal conditions, both engines of the nanogrid would only be run for maintenance once a month for one hour. During emergency conditions, the nanogrid in Preferred Alternative Project Component F would be in full-time operation. The emergency generators would be housed within noise attenuating enclosures which would be installed in a parking lot next to an existing emergency generator. As a result, the units will not contribute significantly to noise levels outside the building. The generators would be air cooled and therefore would have no impacts to water resources. 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 would be installed on an elevated platform estimated at 7 feet above ground surface to comply with NJ TRANSIT's DFE, discussed below. The conceptual platform would be approximately 20,000 square feet and the emergency generators would be 10 to 14 feet tall, bringing the tallest point of the nanogrid to 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. Construction details for these features are discussed in Chapter 17, "Construction Effects."

2.2.8 Preferred Alternative Project Component G—HBLR Connectivity

To provide service along NJ TRANSIT's HBLR, power would be distributed to the individual traction power substations along the HBLR right-of-way. Preferred Alternative Project Component G is approximately 14.4 miles in length and extends from Tonnelle Avenue in North Bergen to 8th Street in Bayonne, including one spur through the West Bergen section of Jersey City to the West Side Avenue Station (Figures 2-6 through 2-9). From the NJ TRANSITGRID East Hoboken Substation to the HBLR, power would be conveyed through electrical lines. The existing traction power substations along the HBLR line would require switchgear revisions to receive incoming power from the microgrid feeders during emergency operation. Upgrades required for this power distribution would occur within existing transportation rights-of-way. Similar to the electrical lines described above, the preferred option for installation of the electrical lines along HBLR would be on new utility poles (up to 39 feet high), within duct banks and attached to elevated HBLR structures. This DEIS evaluated three methods for installation of electrical lines on monopoles (maximum height described above), installed via underground cables in duct banks or attachment to existing infrastructure (i.e., HBLR elevated tracks and bridges) along the HBLR. 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 alternative 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. Monopoles would be installed via the same process as that described above, but the monopole heights would be no taller than 39 feet, so the footing would be proportionately smaller and shallower (e.g., 4-foot diameter, with a 20-foot foundation depth). 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. During construction, specific measures will be in place to prevent worker exposure to or spreading of existing contamination. These measures will be documented in a Materials Management Plan (MMP) and will address contaminated soils and potentially contaminated groundwater. Additional construction details for the new monopoles and duct banks as well as measures to prevent exposure to or spreading of existing contamination are discussed in Chapter 17, "Construction Effects."

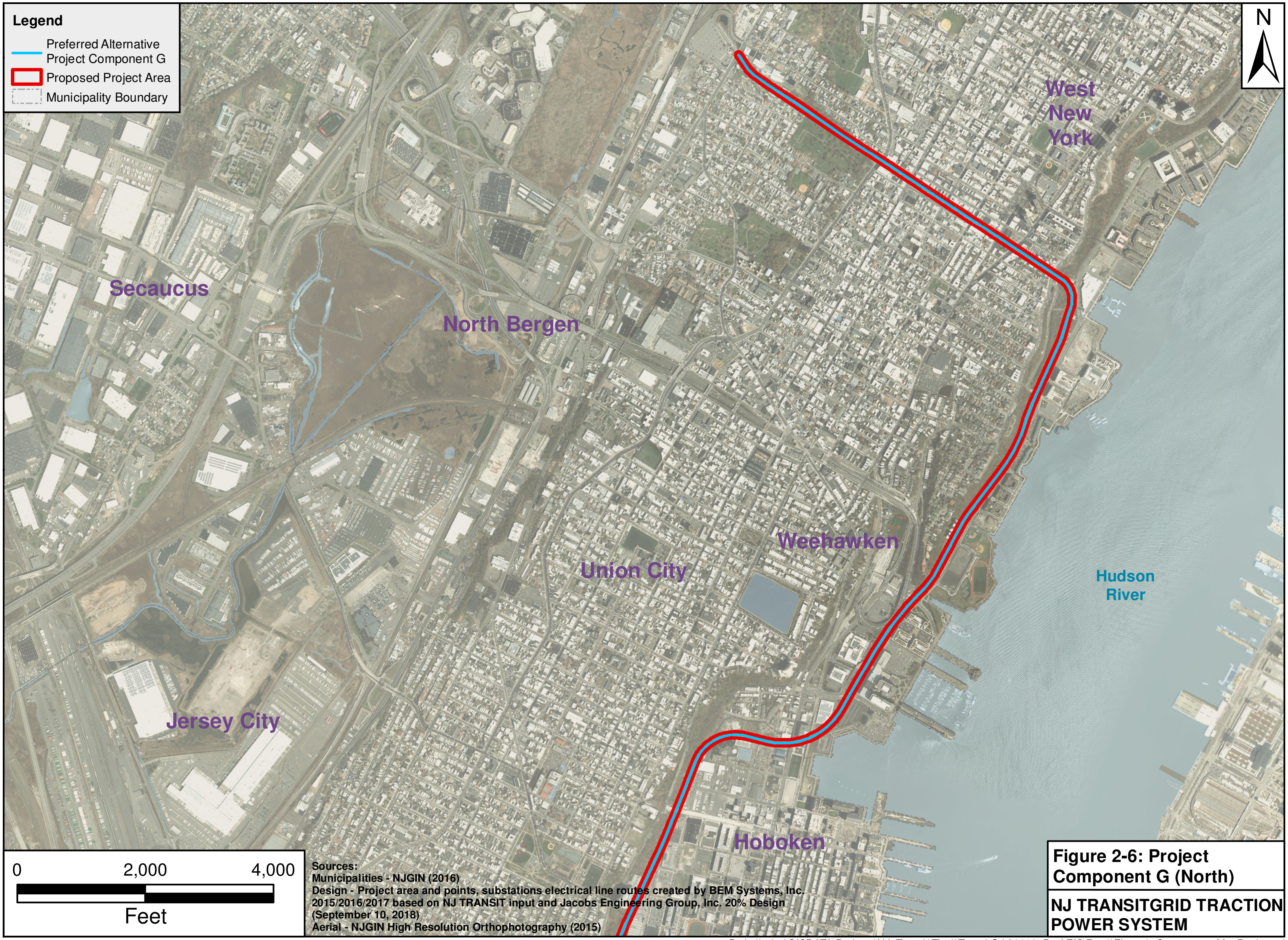

Figure 2-6: Project Component G (North)

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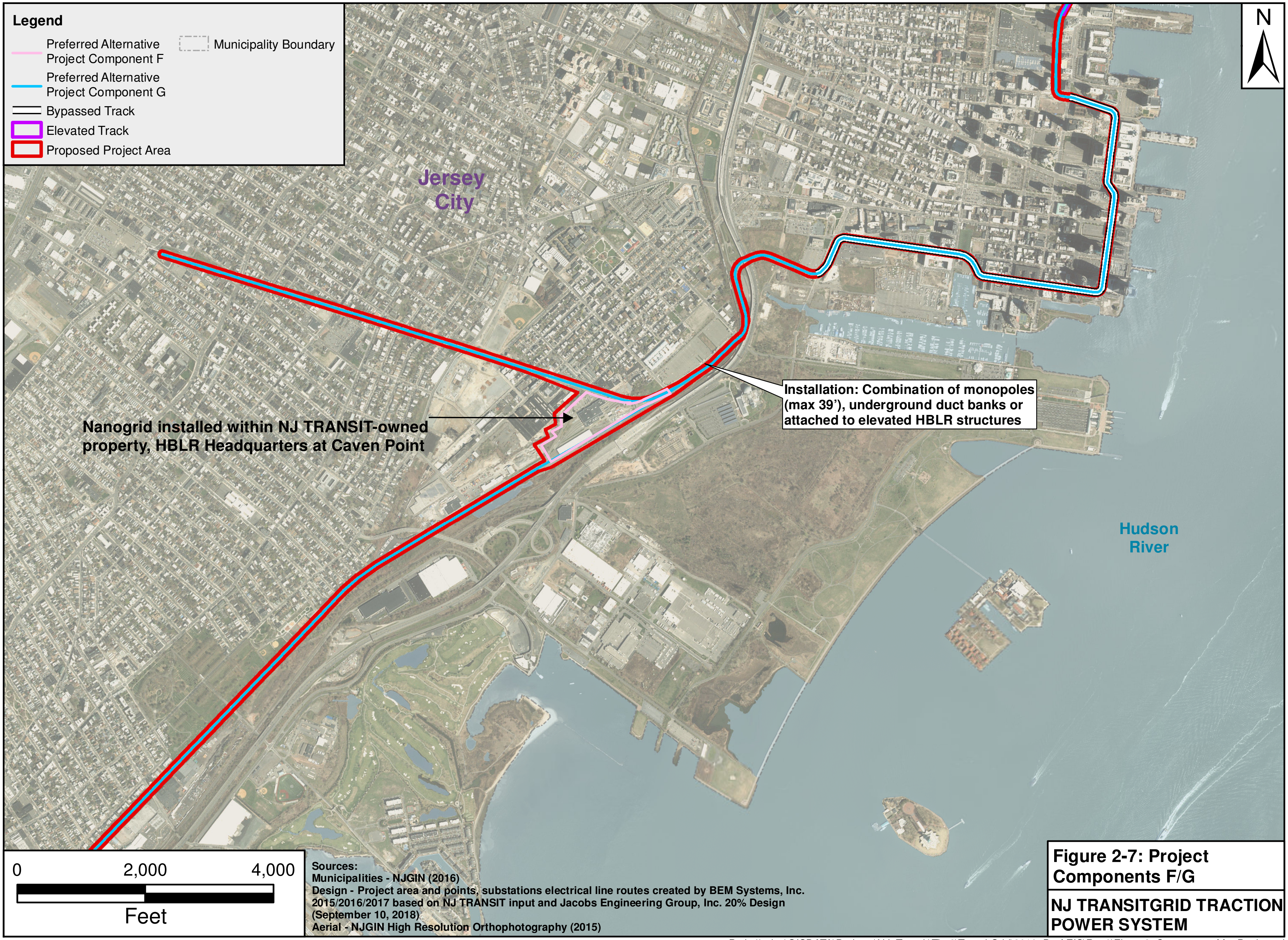

Sources:
Municipalities - NJGIN (2016)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
Aerial - NJGIN High Resolution Orthophotography (2015)

Figure 2-7: Project Components F/G

NJ TRANSITGRID TRACTION POWER SYSTEM

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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)

Figure 2-8: Project Component G (South)

NJ TRANSITGRID TRACTION POWER SYSTEM

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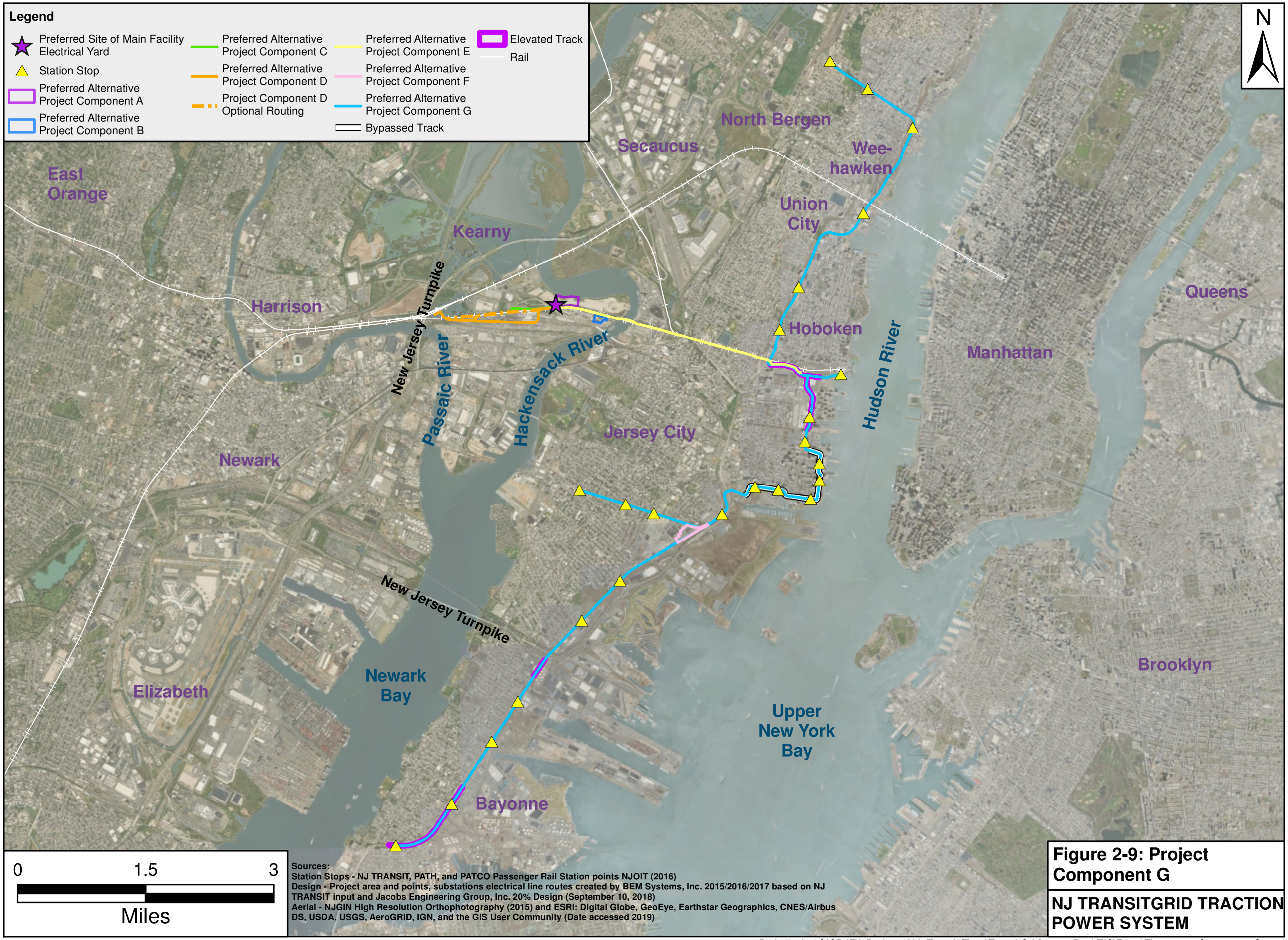

Figure 2-9: Project Component G

NJ TRANSITGRID TRACTION POWER SYSTEM

Sources:
Station Stops - NJ TRANSIT, PATH, and PATCO Passenger Rail Station points NJOIT (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)

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The nanogrid for Project Component F would allow for Project Component G to bypass and avoid the need to install monopoles in a historically significant 1.6-mile segment of the HBLR in Jersey City, while still providing power to the entire HBLR Line. The section that would be bypassed is illustrated on Figures 2-7 and 2-9. The primary reason behind designing the project to bypass this section of HBLR in Jersey City is to avoid construction impacts to the Morris Canal historic resource, discussed further in Chapter 9, "Historic Resources." Even though the proposed Project is being designed to bypass this segment of the HBLR, the segment was evaluated in this DEIS. Construction details for these features are discussed in Chapter 17, "Construction Effects."

2.2.9 Estimated Costs of Build Alternative

Construction

The total commitment of funds required for construction of the overall resiliency project is approximately $546,353,085, which includes the DISTRIBUTED GENERATIONS SOLUTIONS project, which is reviewed separately under NEPA as discussed in Chapter 1, "Purpose and Need." The FTA selected NJ TRANSITGRID as eligible for funding in response to Superstorm Sandy as part of a competitive selection process under the Selection of Public Transportation Resilience Projects in Response to Hurricane Sandy (79 FR 65762), which is funded for $409,764,814 (75% federal match) under the Disaster Relief Appropriations Act of 2013 (Pub. L. 113-2). NJ TRANSIT's commitment of funds to the project is $136,588,271 (25%). The New Jersey State Transportation Trust Fund (TTF) is the source of funding for NJ TRANSIT's commitment.

Revenues

Under normal conditions, NJ TRANSITGRID will potentially supply up to 60MW of traction power for the Northeast Corridor (for Amtrak and NJ TRANSIT trains), meet NJ TRANSIT's Morris & Essex load demand of 10 to 15MW, and transfer excess energy to PJM when those transactions are economically justified.[6] Under emergency conditions (e.g., a PJM system blackout), NJ TRANSITGRID will operate in island mode and meet NJ TRANSIT's usage of parts of the Northeast Corridor, parts of NJ TRANSIT's Morris & Essex and HBLR loads, and assist Amtrak by moving its Northeast Corridor trains to nearby stations.

Fixed Operating Expenses

NJ TRANSITGRID's fixed operating & maintenance (O&M) expenses include plant personnel and insurance. Fixed O&M costs escalate with inflation. Forecasted fuel costs are based on an assumed firm gas supply and delivery arrangements at market rates estimated for 2020. Fuel prices are expected to remain low due to the abundant supply of natural gas.

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[6] Economically dispatched (i.e., produced at the lowest cost to customers) energy sales to PJM are forecasted to grow over time as older generation resources retire, potentially constraining the PJM market. NJ TRANSITGRID's capacity factor for PJM energy sales is forecasted to grow from 8% in 2020 to 19% in 2049. (Levitan & Associates, Inc. 2017).

Variable Operating Expenses

Variable O&M expenses include chemicals and other consumables, accruals for parts replacement, emission controls consumables, and a long-term service agreement (LTSA) with the turbine manufacturer.[7] Such LTSAs are common, especially for plant owners without large portfolios who rely on the manufacturers for major maintenance work (i.e., inspections and overhauls).

Water and waste water disposal will be required for the steam cycle in the HRSG components. Water usage is dependent on plant operations and is significantly affected by cooling tower evaporation that varies with ambient temperature. Water would be purchased from the local water provider that serves this region on an increasing block rate. Waste water will need to be disposed at the commercial / industrial sewer rate set by the local municipal utilities authority.

The TRANSITGRID operations include potential revenues from energy sales to Amtrak, and energy sales to PJM that will provide positive revenues through direct payments and bill offsets that should exceed the operating costs of the proposed Project. Operating costs will vary with fuel/commodity (natural gas) prices, labor costs pertaining to operations and maintenance and inflationary pressures upon capital equipment replacement through the life cycle of the microgrid. Consequently, any projection of revenues generated to offset operating costs will by definition, be variable along with any amount in excess of an operating cost offset. Revenues generated by the NJ TRANSITGRID will be used to support plant operations and NJ TRANSIT's mission of providing public transportation.

Cost estimates were compiled during the project's grant application process (2013) and during initial design phases (2017). The estimated costs of the project are presented in Table 2-1 below.

Table 2-1 Estimated Costs of the NJ TRANSITGRID Project

Project Activity	Estimated Cost	Funding Source
Design and Administration	$83,586,747	**Total Project Funding $546,353,085 million** $409,764,814 (75% federal match) under the Disaster Relief Appropriations Act of 2013 (Pub. L. 113-2) $136,588,271 (25%) of the local match to be funded by the New Jersey State TTF as part of NJ TRANSIT's Capital Program
Construction	$428,327,406	
Annual Operations	$16.6M - $19.5M[8]	Project is anticipated to be self-supporting through participation in local energy markets and power purchase agreements.

[7] Some of these parts and equipment costs may be capitalized for tax and depreciation purposes.
[8] Operation and Maintenance costs estimated during the projects grant application process in 2013.

2.3 NO ACTION ALTERNATIVE

In 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. Without the microgrid, commuter and intercity rail service in Amtrak's and NJ TRANSIT's core service territory would remain vulnerable to power outages. During future widespread power outages, the benefits of NJ TRANSIT possessing a reliable power source to move commuters between Manhattan and other destinations in northern New Jersey would not be realized. There would be a missed opportunity to increase commuter safety and security in future widespread power outages. Under the No Action Alternative, the risk of not building the project is that extended power outages (e.g., greater than two weeks) could occur with an annual chance of occurrence of 3.3 percent (30-year return frequency). In these situations, the impact to the region could be an economic loss of up to $1.7 billion, which would be avoided with the transportation resiliency provided by the proposed Project (Rutgers University 2014).

The No Action Alternative includes other planned and programmed transportation improvements, which are funded through a combination of state and federal monies and will be in place by 2021, the estimated year of completion for the Build Alternative, as discussed below. It includes projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA and its contract purchaser plans for the Koppers Koke Site.

2.3.1 NJ TRANSIT Resilience Program Projects

The proposed Project is one of five key projects that will enhance service reliability and allow NJ TRANSIT to restore service quickly after a major storm. The other resilience projects, which will be built by 2021, include:

- *NJ TRANSITGRID DISTRIBUTED GENERATION SOLUTIONS* (i.e., fuel cells, photovoltaic panels, and other technologies as appropriate) to provide power to rail and bus stations and other NJ TRANSIT infrastructure in northeastern New Jersey. As indicated in Chapter 1, “Purpose and Need,” while these improvements would complement the proposed Project, they would be constructed and function independently from the TRACTION POWER SYSTEM.

- *Signals & Communications Resilience*, which will harden signal and communication systems and other infrastructure on the HBLR system and five commuter rail lines – the Main and Bergen County Lines, Pascack Valley Line, Raritan Valley Line, and Morris & Essex Line. This project is independent from the NJ TRANSITGRID project and will be built regardless of whether the proposed Project advances.

- *Delco Lead Storage and Inspection Facility*, a new electric rail storage yard, service and inspection facility, and track system that will be used to store rail cars and locomotives in a centrally located inland area that is not susceptible to flooding or tree fall, to facilitate the rapid resumption of service after storms have passed. This project is independent from the NJ TRANSITGRID project and will be built regardless of whether the proposed Project advances.

- *Long Slip Fill and Rail Enhancement*, which will build a resilient train station and fill a canal (known as Long Slip) that extends into Hoboken Rail Yard and acts as a conduit for storm surge waters from the Hudson River. The new station will be built on top of the filled area to enable the operation of commuter service even while the yard itself is being shut down in preparation for a significant storm event or returned to service after storm-related or ocean-surge flooding. This project is independent from the NJ TRANSITGRID project and will be built regardless of whether the proposed Project advances.

- *Raritan River Bridge Replacement*, which will address the vulnerability of the existing bridge to major storm events and enhance the reliability of the North Jersey Coast Line service by constructing a new, more resilient bridge. This project is independent from the NJ TRANSITGRID project and will be built regardless of whether the proposed Project advances.

2.3.2 NJ TRANSIT Repair and Resiliency Projects

NJ TRANSIT continues to work towards creating a more resilient transportation system. The NJ TRANSIT DFE criteria requires that the elevations of coastal assets meet or exceed the greater of the FEMA 500-year flood zone elevation or the 100-year flood zone elevation (Base Flood Elevation, or BFE) + 2.5 feet, with inland assets elevated to BFE +1.5 (NJ TRANSIT 2014). To provide increased resiliency, a modified design elevation of BFE + 3.8 feet (rounded up to the nearest foot) was applied to sites within the coastal zone to account for 100-years of sea level rise (SLR), based on the (NOAA) Intermediate-High SLR scenario. The requirements set forth in New Jersey Uniform Construction Code (NJ UCC § 5:23 [2018]) must also be followed. These projects are independent from the NJ TRANSITGRID project and will be built regardless of whether the proposed Project advances. Initiatives affecting transportation services in NJ TRANSIT's service territory include:

- Mason Substation, which will be rebuilt by PSE&G with new switchgear, transformers and the associated relays, circuit breakers, and other electrical system components and ancillary equipment. The project will elevate substation structures and the Kearny Junction Remote Terminal Unit (RTU) house above the NJ TRANSIT DFE as listed above, and components will be designed to better withstand contact with saltwater. The new substation will be built next to the existing substation. Currently, construction is anticipated to begin in spring 2019 and completed by the end of 2021.

- New Henderson Street Substation, which will relocate the facility within Hoboken Terminal Yard and replace storm-damaged equipment at an elevation that meets the NJ TRANSIT DFE of +2.5 feet above the FEMA 100-year flood elevation. The design and required permits were completed in fall 2016 and construction is expected to start in 2018.

- Building 9 Substation, located along the northern perimeter of the MMC by the Morris & Essex Line, will improve substation equipment and associated Rail Operations Center (ROC) switchgear at the MMC. The substation will be elevated above the NJ TRANSIT DFE of +2.5 feet above the FEMA 100-year flood elevation. The substation is being rebuilt by PSE&G.

2.3.3 Amtrak Improvements

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41 to make it less susceptible to flooding. Amtrak is planning to replace two of the existing lattice towers in Cedar Creek Marsh South that carry electrical lines to Substation No. 41 with one monopole due to its greater structural integrity. In addition, Amtrak is currently proceeding with reconstruction of certain elements of Substation No. 42, which is 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. Amtrak will install a new Control House at Substation No. 42, which will improve the resiliency of the Northeast Corridor Hudson River Tunnel section.

2.3.4 Koppers Koke Site

As discussed above, HCIA has elevated 126-acres of the Koppers Koke Site (total acreage for Koppers Koke property is approximately 170 acres), including approximately 20 acres upon which the Main Facility would be located. Plans for a frontage road and access to Route 7 are currently under consideration by HCIA and its contract purchaser, The Morris Companies. A concept application has been submitted to the NJDOT.

NJ TRANSIT studied and investigated the acquisition of parcels from a site in the Town of Kearny, Hudson County, known as the Koppers Koke Site, as early as 2008 in order to construct a rail yard. When the rail yard project was cancelled in 2010, along with the Access to the Region's Core (ARC) Project, HCIA, the owner of the Koppers Koke Site, sought compensation from NJ TRANSIT by reason of alleged impacts to future development of the said property. In July 2013, HCIA filed an Inverse Condemnation action against NJ TRANSIT arising out of NJ TRANSIT's inclusion of the Koppers Koke Site in an approved EIS for rail yard and its cancelation of said project. On December 1, 2014, NJ TRANSIT and HCIA agreed to entry by the Superior Court of New Jersey of a consent order that settled this action and attached a term sheet that set forth the mechanism by which NJ TRANSIT could acquire a portion of the Koppers Koke Site as part of the global resolution of the matter.

Therefore, irrespective of the proposed Project, NJ TRANSIT intends to acquire the 20-acre parcel on the Koppers Koke Site as well as the six-acre parcel from HCIA. This acquisition is currently moving forward under the Settlement Term Sheet agreed to by NJ TRANSIT and HCIA.

Under the No Action Alternative, the 20 acres that NJ TRANSIT is acquiring, as discussed above, would likely be used for ancillary railroad purposes. Without the proposed Project, the existing, man-made basin would not be filled.

2.4 BACKGROUND ON ALTERNATIVES DEVELOPMENT, EVALUATION AND SCREENING

2.4.1 Main Facility Siting Analysis

The preferred site in Kearny was identified as a potential location for the Main Facility based on a site screening analysis, completed in 2015, that evaluated properties on the Kearny Peninsula near two existing substations—NJ TRANSIT's Mason Substation and Amtrak's Substation No. 41 (see Appendix A, "Site Screening Analysis"). As indicated above, the Northeast Corridor and Morris & Essex Line would receive the highest loads from the Main Facility. Microgrids are typically located close to the anticipated usage locations for a variety of reasons. First, shorter electrical lines result in higher plant efficiency since less energy is lost in transmission. Second, reliability is increased since shorter electrical lines reduce the probability of service disruptions due to damage to the lines. Lastly, shorter electrical lines reduce capital and operations and maintenance (O&M) costs and reduce the need to site electrical towers in and near residential areas, which could reduce the potential for community opposition.

Based on comments received during the scoping process for this DEIS, alternative sites outside of Kearny were identified and evaluated for their ability to meet the goals and objectives established for the proposed Project. This section summarizes the results of the initial siting analysis as presented in Appendix A, "Site Screening Analysis," and presents the results of the expanded investigation to address the comments received during scoping.

<u>Initial Siting Analysis</u>

The initial siting analysis only considered properties on the Kearny Peninsula because of the following factors:

- Proximity to the substations that would supply power to the service territory of the Northeast Corridor and Morris & Essex Line;
- Proximity to existing natural gas supply lines;
- Relatively large amount of underdeveloped and vacant land located within an area zoned for heavy industrial use; and
- Desire to reduce the need to construct electrical lines in or above open waterways and wetlands.

In the initial siting analysis, 21 sites on the Kearny Peninsula were evaluated based on siting criteria that considered land availability and how well each site would facilitate the ability of the Build Alternative to meet the objectives of the proposed Project. These criteria include:

- Minimize construction risk;
- Minimize schedule risk;
- Maximize efficiencies in the environmental review and permitting processes;
- Minimize property acquisition requirements to the maximum extent feasible;

- Reduce direct and indirect sources of air emissions to the maximum extent feasible[9];
- Minimize the need to construct in wetlands and open waters;
- Avoid impacts on parklands, open spaces, and environmental conservation areas; and
- Minimize construction impacts to the extent feasible.

The first step in the site selection screening process was to identify properties of a minimum size and layout to host such a facility, which was determined to be at least 20 acres. The site must accommodate an access road, a parking lot, water and ammonia tanks, turbines, cooling towers and reciprocating engine equipment, and a main building that would house a single steam turbine, auxiliary bays, maintenance shop, locker room, laboratory, control room, office facilities, and other general-use spaces. Space for substations, transformers, and switchgear and motor controls for the main and auxiliary (black start) power systems is also needed. Based on a preliminary site layout, which follows standard industry requirements for distances between certain equipment, the minimum size of the parcel needed was 20 acres. If an individual site was not greater than or equal to 20 acres, adjacent parcels were combined to total 20 acres and included for consideration as a site alternative. Property boundaries and ownership information were obtained from a variety of sources.[10]

Sites that have been previously developed, but do not contain an active land use, were selected over undeveloped areas and those that would require displacement of a business to meet the proposed Project's goals and objectives. Of the 21 parcels identified via property records, 13 of them were eliminated based on the existence of current land uses on the site or because the property is composed of an open water resource (see Table 1 in Appendix A, "Site Screening Analysis").

The Kearny site located in the central portion of the Redevelopment Area was selected as the preferred site because it is the only site that meets all aspects of the siting criteria, including minimization of property acquisition. In addition, none of the other seven remaining sites would offer any advantage over use of the Kearny site. Use of the Kearny site supports the MRC's goal of Brownfields redevelopment. Since it is being prepared for development by HCIA and has already been raised to an elevation that exceeds NJ TRANSIT's DFE of +2.5 feet above the FEMA 100-year flood elevation, construction and schedule risks are minimized. Its location adjacent to the Morris & Essex Line and at a crossing of a high-pressure natural gas pipeline minimizes property acquisition requirements for the Main Facility (due to the property acquisition which is occurring as part of unrelated litigation), pipeline connection, and

[9] It is important to note that the entire State of New Jersey is currently designated as nonattainment for ozone under the Clean Air Act. Since ozone is a result of emissions of Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOCs) transported downwind from combustion sources (including out-of-State sources), siting power generation anywhere within New Jersey would have similar impacts with respect to ozone nonattainment. Therefore, use of any site in New Jersey would be expected to result in similar impacts on ozone levels.

[10] New Jersey Geographic Information Network, State of New Jersey Composite of Parcels Data, and tax information from the New Jersey Treasury Department.

installation of electrical lines. Finally, the nearest residences, and other sensitive receptors, are approximately 0.75 miles away, on the opposite side of the Pulaski Skyway.

Expanded Siting Analysis

Areas of investigation for the expanded siting analysis were identified by considering sites of at least 20 acres. Consistent with the initial siting analysis, the new facility must be in an industrial area that hosts both a rail line and a natural gas pipeline to minimize property acquisition requirements, construction risk, and community impacts to the extent feasible.

As shown on Figure 2-10, outside of Kearny, natural gas supply pipelines are located within close proximity to the railroad right-of-way in the industrial areas adjacent to the Hackensack River in Jersey City and the Passaic River in Harrison. There are no other locations in surrounding counties that meet these siting criteria, which relate to the proposed Project's goals and objectives.

Three areas of investigation (see Figure 2-11) were identified based on the presence of vacant or underutilized parcels that could be combined to provide the 20-acre site that is needed for the Main Facility. Developed sites in active use in the industrial areas were eliminated from consideration. Two areas in Jersey City – the Howell Street area and a portion of PSE&G Hudson Generating Station property – and the waterfront area in Harrison near the new Red Bull stadium were investigated further. Property boundaries and ownership information were obtained for parcels within these areas:

- **Site 1 – Waterfront Industrial Area, Harrison:** While individual parcels of adequate size are available in this area, in particular the PSE&G properties (Block 78 Lot 1 and Block 143 Lot 7.A) and Block 138 Lot 1 owned by Russo at Harrison I, LLC, they are within a Waterfront Redevelopment Area – a 250+ acre area designated by the Harrison Town Council in 1997. The Master Plan for the Town of Harrison and its 2012 update call for waterfront parks, office, retail and residential development in this area. Red Bull Arena, which is part of the revitalization effort, was completed in 2010. Several other projects have received site plan approvals and construction is underway for MetroCentre, a new mixed-use development of Class A office space, retail space, housing and parking. MetroCentre will occupy all properties to the south of the Northeast Corridor between Frank E. Rodgers Boulevard and the Red Bull Arena including Block 138 Lot 1 (Figure 2-12). The U.S. Army Corps of Engineers (USACE) is completing a flood control project, which will include a combination of floodwalls and levees designed to provide protection from tidal floods along the Passaic River. Waterfront boulevards, walkways, and parks are planned as a companion to the USACE flood control project at both PSE&G properties (Blocks 78 and 143) (Heyer Gruel and Associates 2012; Town of Harrison 2015). The triangular area north of the Northeast Corridor (Block 133 Lot 1) will be developed as part of the "Harrison Station" transit oriented mixed-use development project.
- **Site 2 – Howell Street Area, Jersey City:** The area near Howell Street in Jersey City was investigated due to the number of consecutive lots in Block 7402 and 7404 that are vacant or underutilized (Figure 2-13). Combined, these 11 lots total approximately 23 acres. Block 7402 Lots

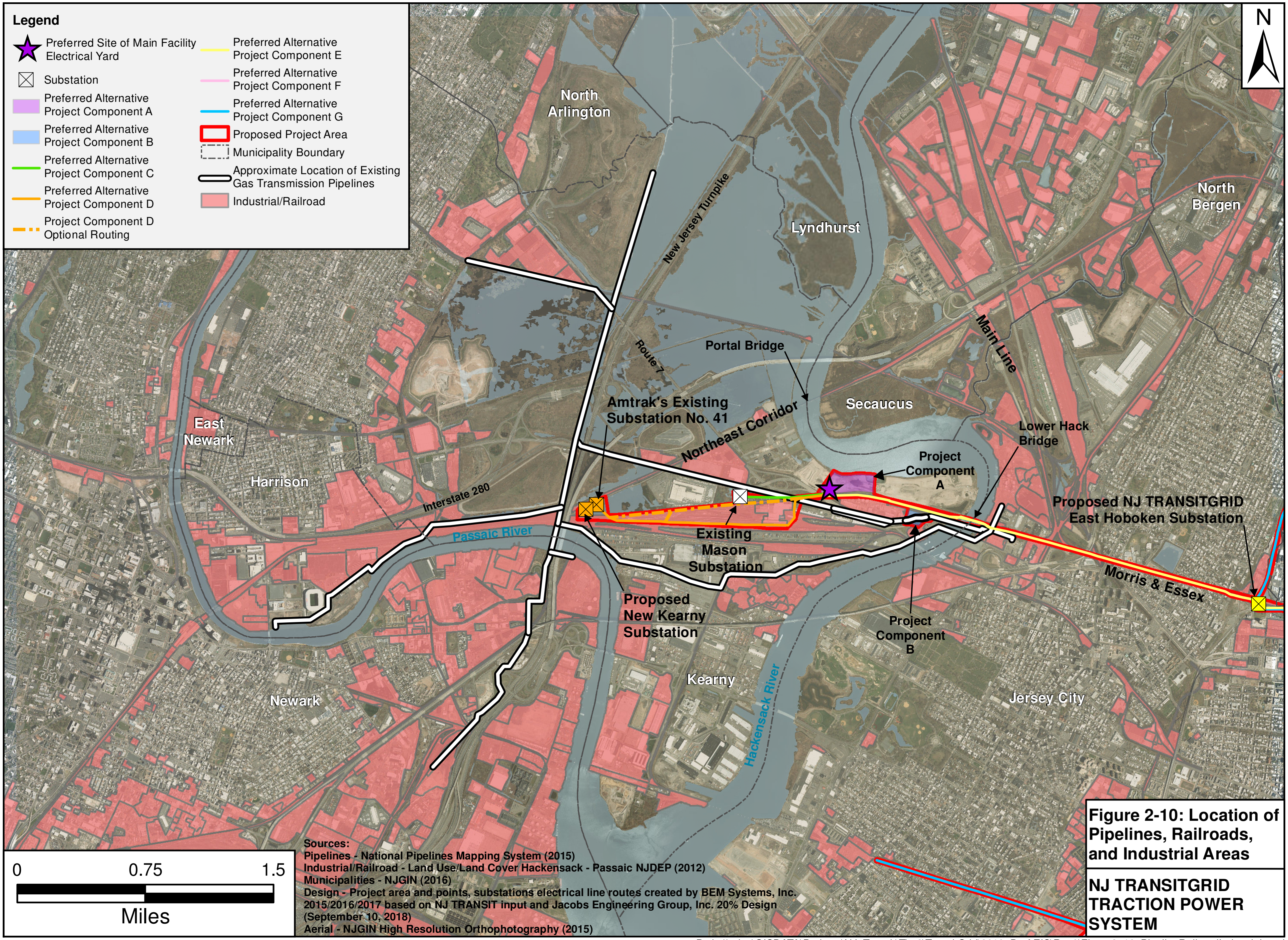

Figure 2-10: Location of Pipelines, Railroads, and Industrial Areas

NJ TRANSITGRID TRACTION POWER SYSTEM

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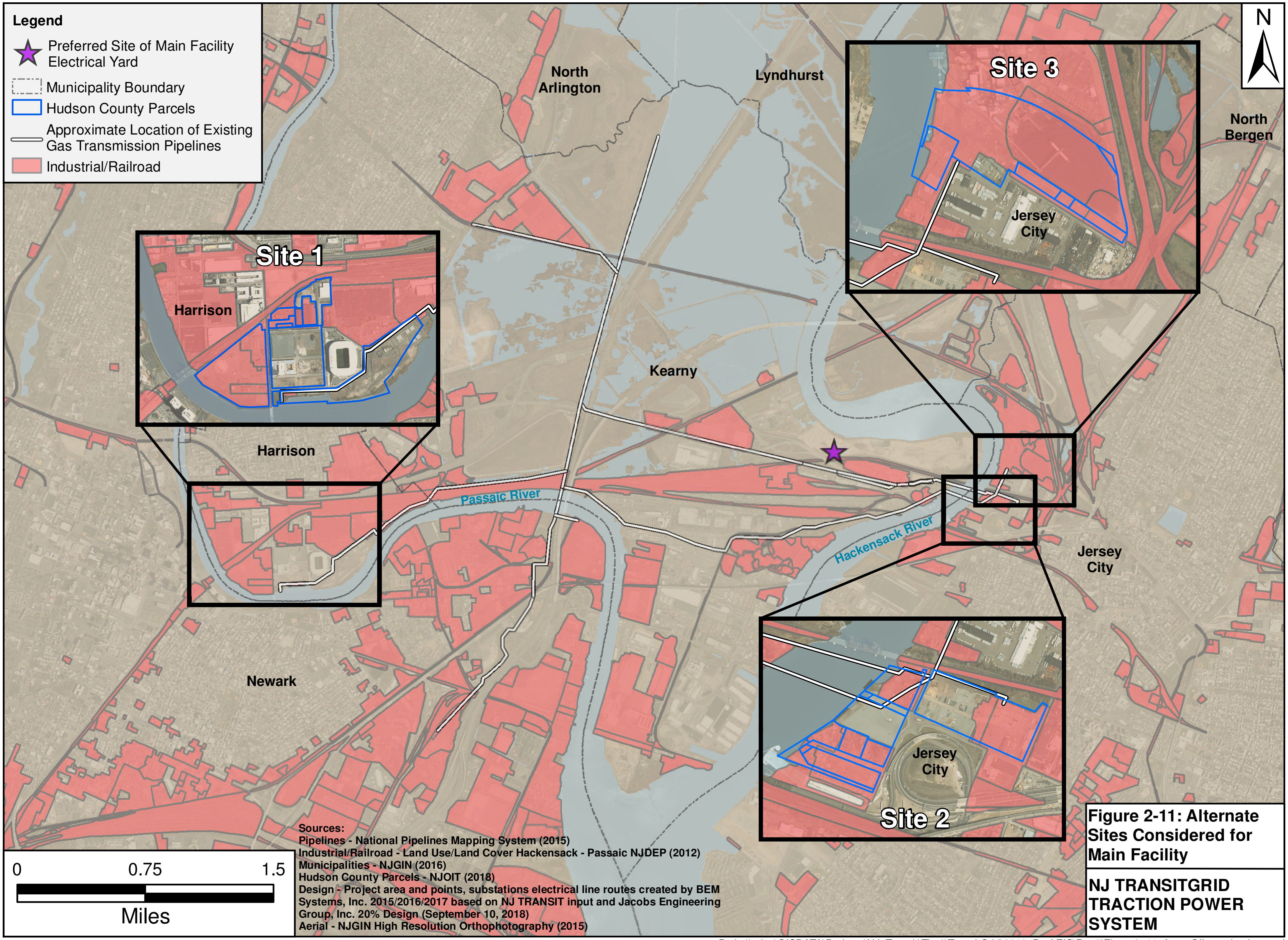

Sources:
Pipelines - National Pipelines Mapping System (2015)
Industrial/Railroad - Land Use/Land Cover Hackensack - Passaic NJDEP (2012)
Municipalities - NJGIN (2016)
Hudson County Parcels - NJOIT (2018)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
Aerial - NJGIN High Resolution Orthophotography (2015)

Figure 2-11: Alternate Sites Considered for Main Facility

NJ TRANSITGRID TRACTION POWER SYSTEM

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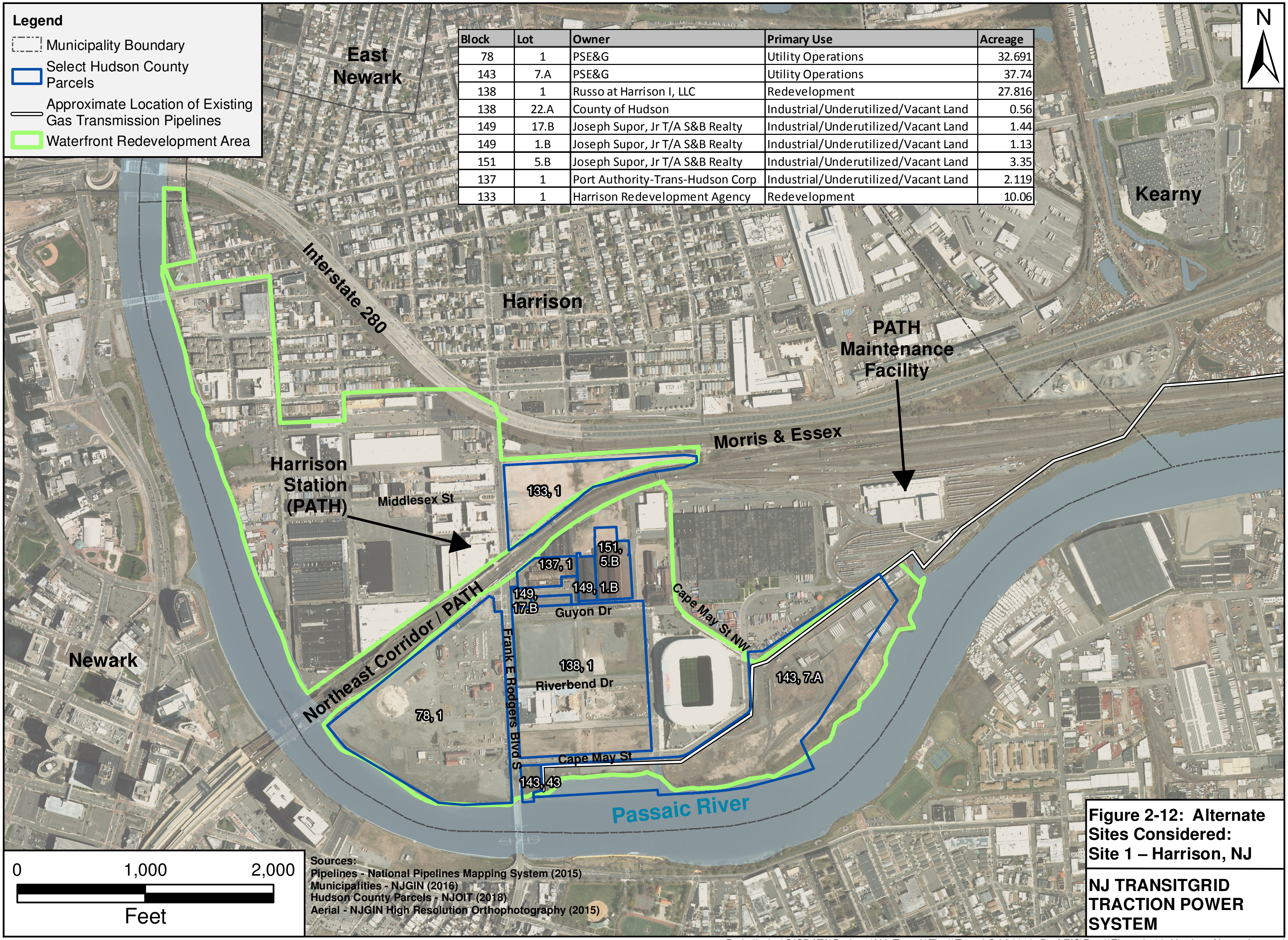

Block	Lot	Owner	Primary Use	Acreage
78	1	PSE&G	Utility Operations	32.691
143	7.A	PSE&G	Utility Operations	37.74
138	1	Russo at Harrison I, LLC	Redevelopment	27.816
138	22.A	County of Hudson	Industrial/Underutilized/Vacant Land	0.56
149	17.B	Joseph Supor, Jr T/A S&B Realty	Industrial/Underutilized/Vacant Land	1.44
149	1.B	Joseph Supor, Jr T/A S&B Realty	Industrial/Underutilized/Vacant Land	1.13
151	5.B	Joseph Supor, Jr T/A S&B Realty	Industrial/Underutilized/Vacant Land	3.35
137	1	Port Authority-Trans-Hudson Corp	Industrial/Underutilized/Vacant Land	2.119
133	1	Harrison Redevelopment Agency	Redevelopment	10.06

Figure 2-12: Alternate Sites Considered: Site 1 – Harrison, NJ

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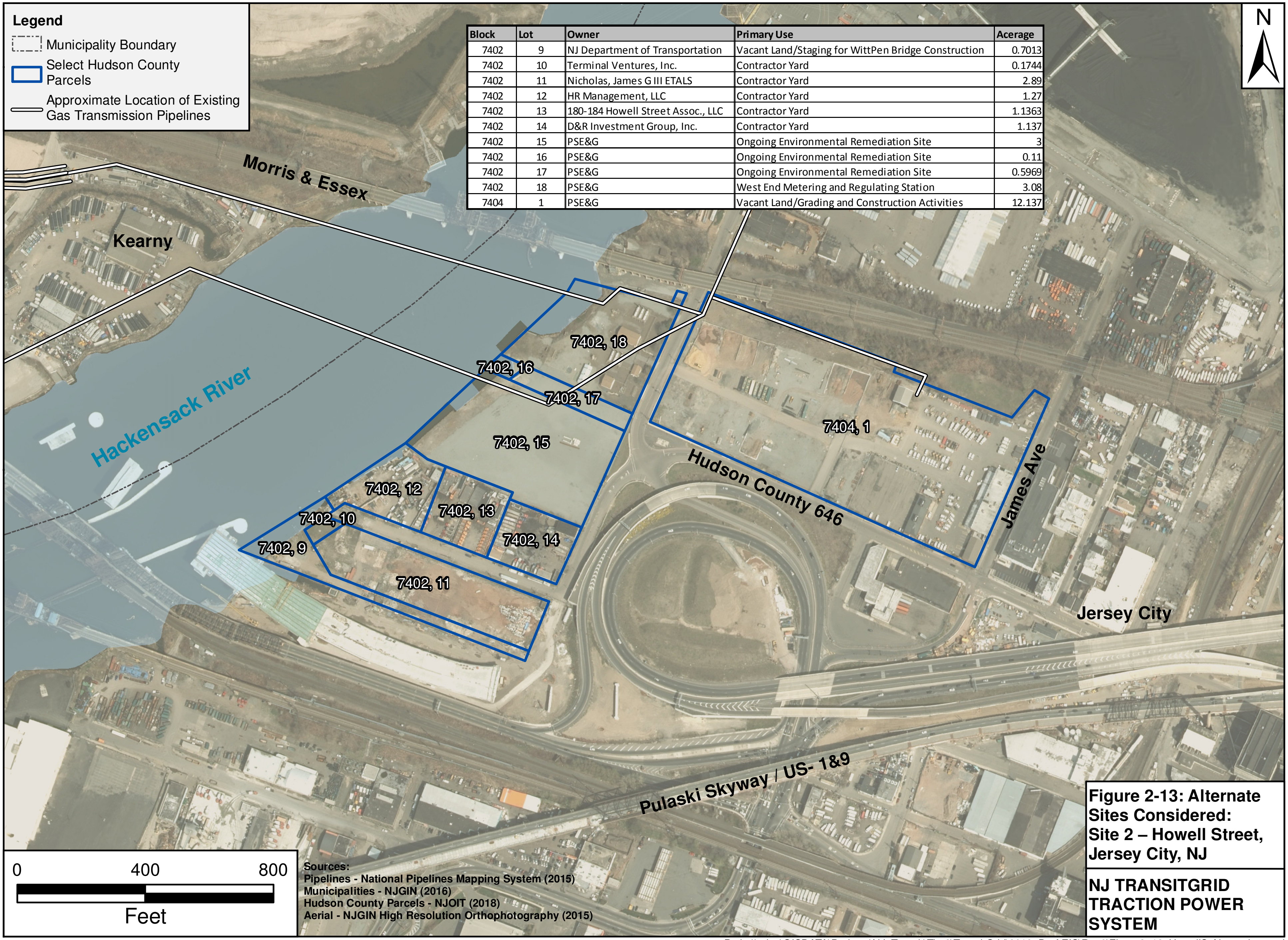

Block	Lot	Owner	Primary Use	Acerage
7402	9	NJ Department of Transportation	Vacant Land/Staging for WittPen Bridge Construction	0.7013
7402	10	Terminal Ventures, Inc.	Contractor Yard	0.1744
7402	11	Nicholas, James G III ETALS	Contractor Yard	2.89
7402	12	HR Management, LLC	Contractor Yard	1.27
7402	13	180-184 Howell Street Assoc., LLC	Contractor Yard	1.1363
7402	14	D&R Investment Group, Inc.	Contractor Yard	1.137
7402	15	PSE&G	Ongoing Environmental Remediation Site	3
7402	16	PSE&G	Ongoing Environmental Remediation Site	0.11
7402	17	PSE&G	Ongoing Environmental Remediation Site	0.5969
7402	18	PSE&G	West End Metering and Regulating Station	3.08
7404	1	PSE&G	Vacant Land/Grading and Construction Activities	12.137

Sources:
Pipelines - National Pipelines Mapping System (2015)
Municipalities - NJGIN (2016)
Hudson County Parcels - NJOIT (2018)
Aerial - NJGIN High Resolution Orthophotography (2015)

Figure 2-13: Alternate Sites Considered: Site 2 – Howell Street, Jersey City, NJ

NJ TRANSITGRID TRACTION POWER SYSTEM

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12, 13 and 14 are occupied by contractor storage units and Block 7402 Lot 15 is the location of the former West End Gas Plant and an active remediation effort is underway. Block 7402 Lot 18 contains PSE&G's West End Metering & Regulating station. Other lots in the area appear to be under construction and some are being used as staging areas for the Wittpenn Bridge construction.

- **Site 3 – Hudson Generating Station, Jersey City**: The portion of PSE&G's Hudson Generating Station property that contains a large coal pile was investigated since PSE&G is currently converting the coal-fired power plant to natural gas. As shown on Figure 2-14, portions or all of Block 7402 Lots 22, 23, 33, 34 and 35 would need to be combined to form a 20-acre site. Lots 33, 34 and 35 are currently used for parking and power plant equipment occupies portions of Lots 22 and 23.

These sites were evaluated in relation to both the proposed Project's goals and objectives, and in comparison, to the Kearny site, as follows:

Minimize Construction Risk

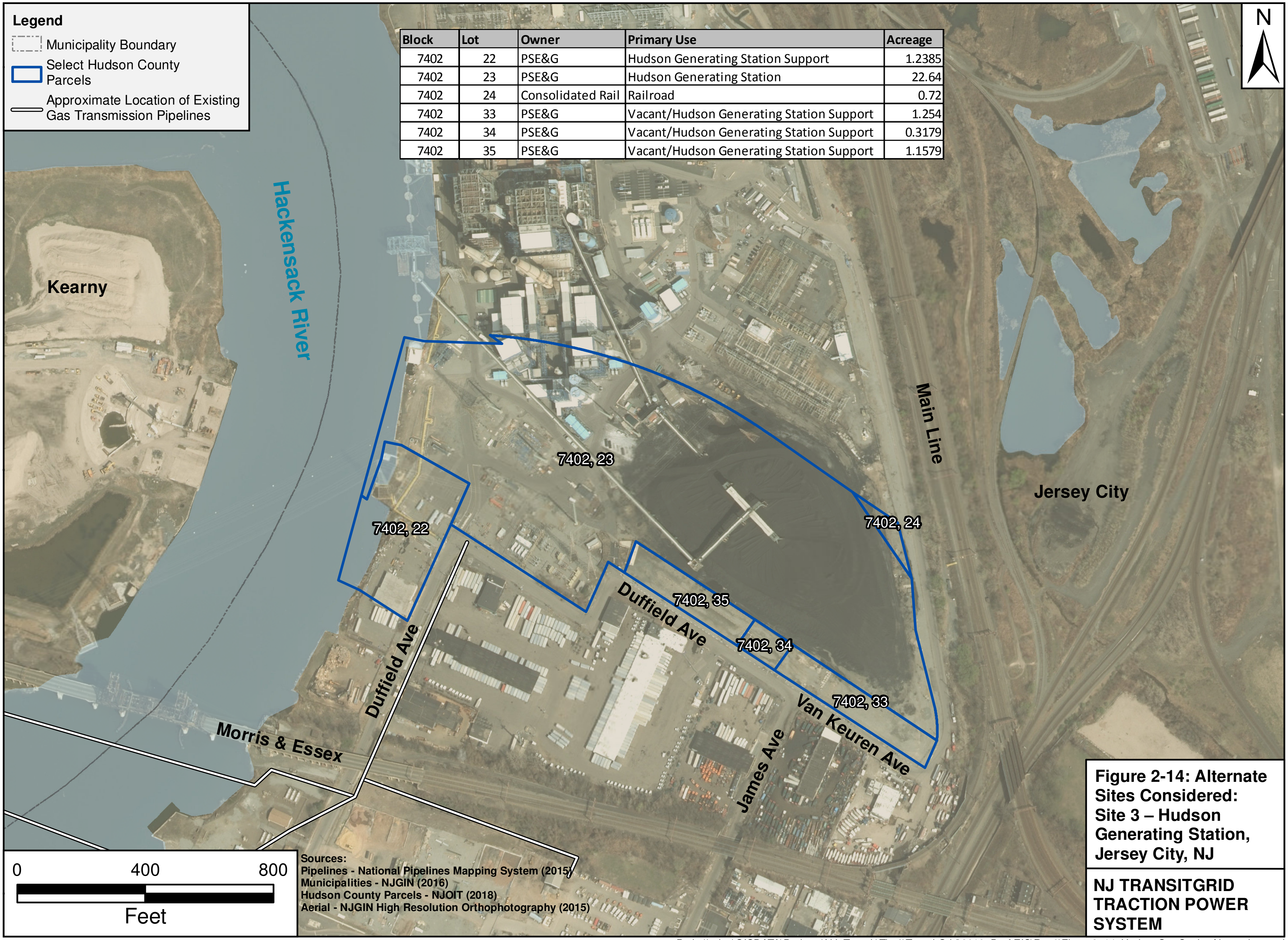
Each of the three areas would present some degree of construction risk due to the former or current industrial use of the property and the potential for soil and groundwater contamination. The Howell Street area remediation project and Hudson Generating Station coal pile present added risks and prior to property acquisition a comprehensive soil and groundwater sampling program would be required. The Kearny site offers low construction risk due to the site investigations and remediation that have already occurred and since the site is under contract for redevelopment by warehouse related uses, which reduces the potential to encounter unexpected conditions during construction compared with the other sites.

Minimize Schedule Risk

The Kearny site presents the least risk to the proposed Project schedule since it is vacant and available for redevelopment and has been raised to exceed NJ TRANSIT DFE criteria. The three areas in Harrison and Jersey City have a higher construction risk, which also translates to a higher risk to the proposed Project schedule. The Howell Street area requires property acquisition from multiple owners and relocation of contractor storage areas, which would add about two years to the schedule due to the federal requirements that must be followed for property acquisition and relocations. All three areas increase the chance that contested condemnation proceedings would be required, which increase risk to the Project schedule. In addition, all three areas would require site clearing (extensive in the case of the PSE&G property in Jersey City) and site preparation including bringing in fill to raise the site to meet flood elevation criteria.

Maximize Efficiencies in the Environmental Review and Permitting Processes

Acquisition of parcels in industrial areas that have not been fully investigated for soil and groundwater contamination or where an active remediation project is ongoing would not meet the objective of streamlining the environmental review and permitting processes. Relative to the three areas of



Block	Lot	Owner	Primary Use	Acreage
7402	22	PSE&G	Hudson Generating Station Support	1.2385
7402	23	PSE&G	Hudson Generating Station	22.64
7402	24	Consolidated Rail	Railroad	0.72
7402	33	PSE&G	Vacant/Hudson Generating Station Support	1.254
7402	34	PSE&G	Vacant/Hudson Generating Station Support	0.3179
7402	35	PSE&G	Vacant/Hudson Generating Station Support	1.1579

Figure 2-14: Alternate Sites Considered: Site 3 – Hudson Generating Station, Jersey City, NJ

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure2_14_HudsonGenStationAlternative.mxd investigation, the Kearny Site best meets this objective as it has been fully investigated and site capping is close to completion and it is available for redevelopment. The site is under oversight of NJDEP Licensed Site Remediation Professional (LSRP); however, ground water remediation is ongoing and is not expected to be close to completion.

Minimize Property Acquisition Requirements to the Maximum Extent Feasible

None of the three areas investigated would meet this objective since: the proposed Project is not consistent with the redevelopment plans that have been identified for the Harrison area; the Howell Street area requires acquisition of multiple properties and relocations; and the Hudson Generating Station area requires acquisition of property that is currently being used by PSE&G. The Kearny site meets this objective as it is directly adjacent to the Morris & Essex Line and gas pipeline for routing of the electrical line and gas pipeline connection. As discussed above, NJ TRANSIT will acquire the 26 acres due to the 2014 consent order agreed to between NJ TRANSIT and HCIA.

Reduce Direct and Indirect Sources of Air Emissions to the Maximum Extent Feasible

The Kearny site is the nearest to both Mason Substation and Substation No. 41 and would require the shortest length of electrical lines to these facilities. This decreases transmission losses, which increases efficiency, reducing power demand.

Minimize the Need to Construct in Wetlands and Open Waters

The potential for impacts to wetlands would be minimal for construction in any of the three areas of investigation. For all site options, the New Kearny Substation would be constructed in open water. However, none of the sites investigated for the construction of the Main Facility would require construction in open waters. The three areas and the Kearny site would meet this objective to the same degree.

Avoid Impacts on Parklands, Open Spaces, and Environmental Conservation Areas

The Harrison area would not meet this objective as waterfront parks are proposed along the Passaic River. The other areas and the Kearny site would meet this objective to the same degree.

Minimize Construction Impacts to the Extent Feasible

The Jersey City areas are within industrial zones and the Harrison waterfront area has a considerable amount of construction underway and more planned that would likely be underway during construction of the proposed Project. Each of the areas has good highway access. Construction impacts would be similar at all of the sites. The Kearny site would minimize construction impacts to the maximum extent since it is a large site that is being readied for development by HCIA.

Based on these considerations, the three sites outside of Kearny were eliminated from further consideration. The Kearny site located in the central portion of the Redevelopment Area was selected as the preferred site over these three locations because it is the only one that meets all aspects of the siting criteria. In addition, none of the three sites outside of Kearny would offer any advantage over use of the Kearny site.

2.4.2 Alternatives Development for the Main Facility

The equipment for the Build Alternative was specified by considering a number of factors related to the goals and objectives identified for the proposed Project. Use of black start engines and gas turbines in a combined-cycle plant was evaluated. Options were evaluated with respect to the degree to which they could facilitate an alternative's ability to meet proposed Project objectives. Those that relate to technology and plant types include the objective to:

- Provide a highly reliable power source, utilize modern state-of-the-art resilient equipment, and incorporate advanced resilient safety technology;
- Achieve an economically feasible and cost-effective project, minimize capital and O&M costs, operate 24/7;
- Expedite project delivery, minimize schedule risk and maximize efficiencies in the environmental review/permitting processes;
- Reduce direct and indirect sources of air emissions to the extent feasible.

The Build Alternative would satisfy Project Goal Nos. 1 through 4 described in Chapter 1, "Purpose and Need." During the design engineers' concept validation phase, a total of nine equipment and housing configurations were evaluated for meeting requirements of the proposed Project and project budget compatibility (Jacobs 2017a).

The financial analysis considered a 30-year project life; present values; operating costs including utilities, fuel and maintenance; and potential revenue.

In the end, the equipment configuration that includes five gas turbines, one steam turbine and two black start engines (Build Alternative), all housed on the Koppers Koke Site was recommended for final design. This configuration provides the mission requirements with safe margin, is within the project budget and provides the best long-term cost effectiveness.

As indicated above in Section 2.2, the combined-cycle plant has been identified as the Build Alternative and is included in the detailed analysis in this DEIS. The Build Alternative would be designed to provide a highly reliable power source that utilizes modern state-of-the-art resilient equipment and incorporates advanced resilient safety technology. Gas turbines of the size specified are made in the United States and, as a result, their use would comply with FTA's Buy America regulations (49 CFR § 661 [2012]), allowing for an expedited project delivery schedule.

The use of solar panels, wind energy, and other "green" technologies to fully "island" the NJ TRANSIT and Amtrak electrical systems from the larger commercial power grid are not practical or reasonable alternatives to a natural gas-fired generation plant due to the required load generation capacity, siting requirements for these technologies, the need to meet rapidly fluctuating loads associated with traction power systems under island conditions (especially due to the need for energy storage to guarantee a reliable power source), and cost. As discussed above, a solar panel facility would be installed to supplement the power needed to run the microgrid itself. Therefore, such technologies for generation of all power needs were not retained for analysis in the DEIS.

2.4.3 Installation Options for the Electrical Lines

As described above, the preferred alternative for installation of electrical lines is 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. This EIS discloses the potential impacts from all potential installation methods— installation of new monopoles (maximum heights previously described for Preferred Alternatives for Project Components C, D-south alignment, E and G above), the construction of duct banks, Hackensack River crossing options (aerial route [preferred option], submarine cable, or directional drill under the river bottom) and attachment to existing NJ TRANSIT infrastructure (i.e., HBLR elevated tracks and bridges), see Figure 2-1.

2.5 EIS ANALYSIS FRAMEWORK

To provide for a comprehensive and conservative environmental review document, each technical chapter of this DEIS includes an analysis of potential impacts (favorable or adverse) of and any mitigation required for all relevant project components. The preferred alternative for each project component is presented in Table 2-2. The analysis will describe normal operating conditions, and conditions under emergency operating conditions, if these differ from normal operating conditions.

Table 2-2: Build Alternative Project Components Summary

Project Component	Description
Preferred Alternative Project Component A: Main Facility	Combined-cycle gas turbine plant - 5 natural gas turbines (21MW to 25MW each)* o With 2 connected to HRSGs - 1 steam turbine (14MW to 18MW)* - 2 emergency black start engines (not to exceed 2.5MW) Four-acre solar panel facility over stormwater detention basin (approximately 0.6MW) Static Frequency Converter yard 230kV 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 MMC property (combination of 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: - 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 monopoles 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 - 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.

Chapter 3 Land Use, Zoning, and Public Policy

3.1 INTRODUCTION

This chapter examines the potential for the No Action and Build Alternative to impact land use, zoning, and public policy. Land use is the activity occurring on a particular piece of land and in the structures that occupy the land. Land uses may be categorized broadly (e.g., residential, commercial, industrial) or in more detail by specifying the particular use. Zoning is the classification and regulation of land according to use categories, developed by the local jurisdiction. Zoning controls the type, density, and bulk of development in a given jurisdiction by establishing districts where specific land uses are allowed. Public policy may include development plans and other types of policies adopted by localities to identify community goals and guide development and green space preservation. Although not required by NEPA, public policy is being analyzed to evaluate compliance with local requirements. The methodology for this analysis is presented below, followed by a description of existing baseline conditions, projected future conditions without the proposed Project, and the potential for impacts to result from advancing the Build Alternative. Property acquisition requirements associated with the Build Alternative are also identified.

3.2 METHODOLOGY

Two study areas were developed for this analysis:

1) The proposed Project area plus a 500-foot buffer on either side of the electrical line routes (including alternative routes), new substations and HBLR Headquarters.

2) The two-mile study area, which includes the area within a two-mile radius of the Main Facility's stacks on the Koppers Koke Site, is used to address air quality modeling regulations and identify sensitive land uses within those boundaries (NJDEP 2009). In this chapter, the two-mile radius study area is for analysis of land use only.

The proposed Project area is defined as the potential construction footprint of the Build Alternative, and includes:

- The Main Facility and natural gas pipeline connection to the Main Facility (Preferred Alternative Project Components A and B);
- the railroad right-of-way, including the HBLR, that would be used for the proposed electrical lines (Preferred Alternative Project Components C, D, E and G, optional routing for Project Component D); and
- the NJ TRANSIT owned HBLR Headquarters property on Caven Point Avenue (Preferred Alternative Project Component F).

The 500-foot study area is used for analysis of land use, zoning and public policy. The land use, zoning and public policy analysis was performed according to the following methodology:

- Preparing land use and zoning maps based on published data, maps and other available documentation;
- Describing existing land uses and zoning in the study area and planned projects that are scheduled to be completed by 2021 (future No Action conditions);
- Qualitatively assessing the compatibility of the Build Alternative with existing and proposed land uses, and compliance with or variance from land use patterns, zoning and public policy initiatives;
- Evaluating the proposed Project's compliance with the *Koppers Coke Peninsula Redevelopment Plan* (the Redevelopment Plan) (NJMC 2013) including: setbacks, site development regulations, and local code requirements applicable to the zone and scale and type of development; and
- Identifying properties that need to be acquired in order to construct and operate the proposed Project, including partial and full permanent and temporary fee acquisitions and easements.

3.3 AFFECTED ENVIRONMENT

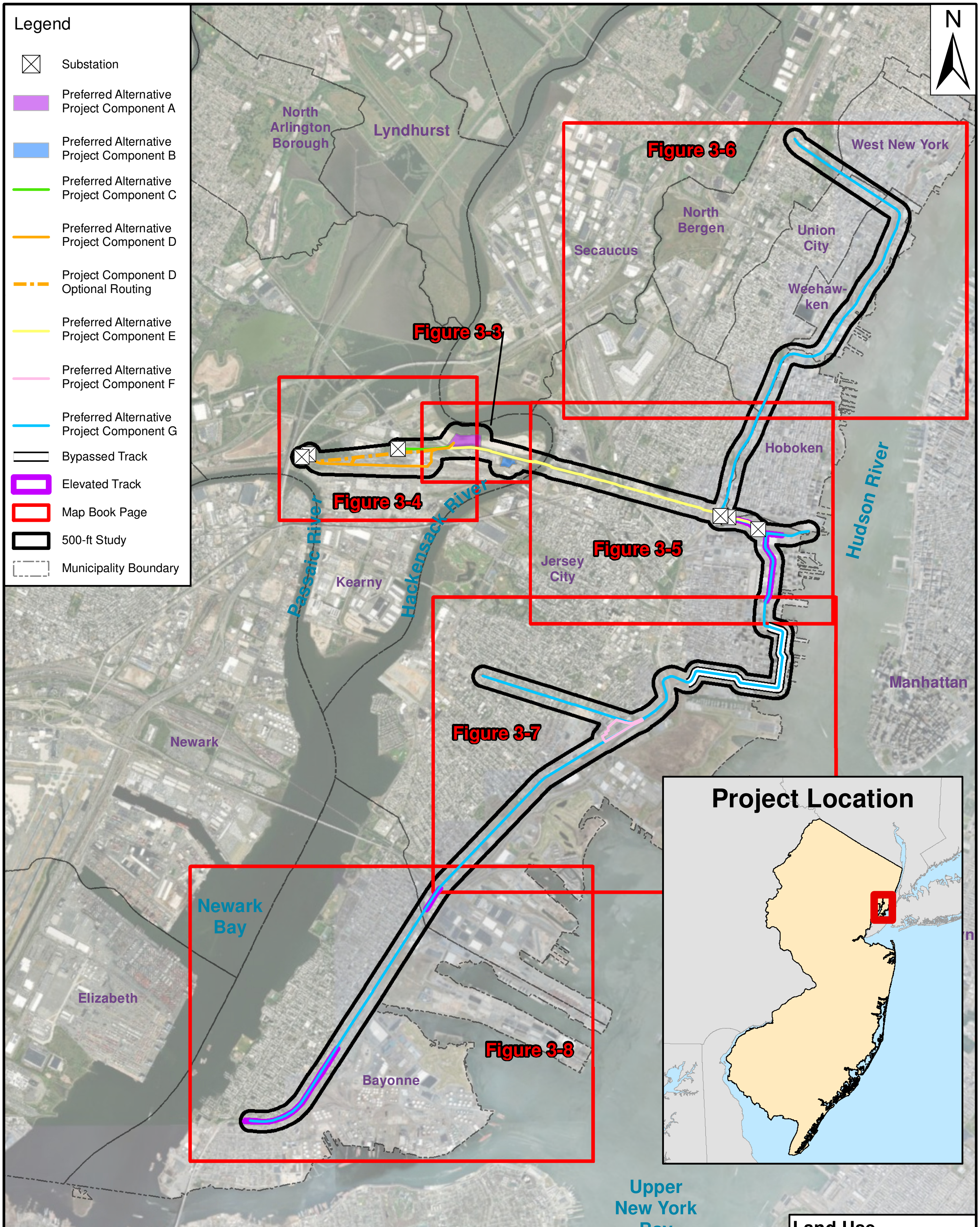
3.3.1 Land Use

Land uses in both study areas for the Build Alternative are shown on Figures 3-1 through 3-8 and discussed separately below.

Project Area Plus 500-Foot Buffer

The proposed Project area extends from the new Kearny Substation location at the western end, adjacent to the existing Amtrak Substation No. 41 in the Town of Kearny, Hudson County, NJ, across the Hackensack River to the new NJ TRANSITGRID East Hoboken Substation (see Figure 3-1) and the Henderson Street Substation at the eastern end in Jersey City, Hudson County. The proposed Project area also includes the NJ TRANSIT owned HBLR Headquarters property on Caven Point Avenue in Jersey City for Preferred Alternative Project Component F and the approximately 14.4 miles of the HBLR where new electrical lines for Preferred Alternative Project Component G would be installed (see G in Figure 3-1 and Figure 3-2). The land uses near Project Components A through G are described below.

Preferred Alternative Project Components A (Main Facility) and B (six-acre parcel) are located in a heavily industrialized area (see Figure 3-1) on the northern end of the Kearny Peninsula and along the western shore of the Hackensack River. As shown in Figure 3-9, they are located within to the Redevelopment Area as defined in the Redevelopment Plan and are a part of the former "Koppers Seaboard Koke and By-Products Plant," also known as the "Koppers Koke Site." The Koppers Koke Site is approximately 170 acres in size and comprises two parcels—the large parcel to the north of NJ TRANSIT's Morris & Essex Line and the six-acre parcel south of the Morris & Essex Line. Entrances to the large parcel are located at One Fish House Road, through a culvert under the Morris & Essex Line, and an existing west access point that



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)

Land Use Key Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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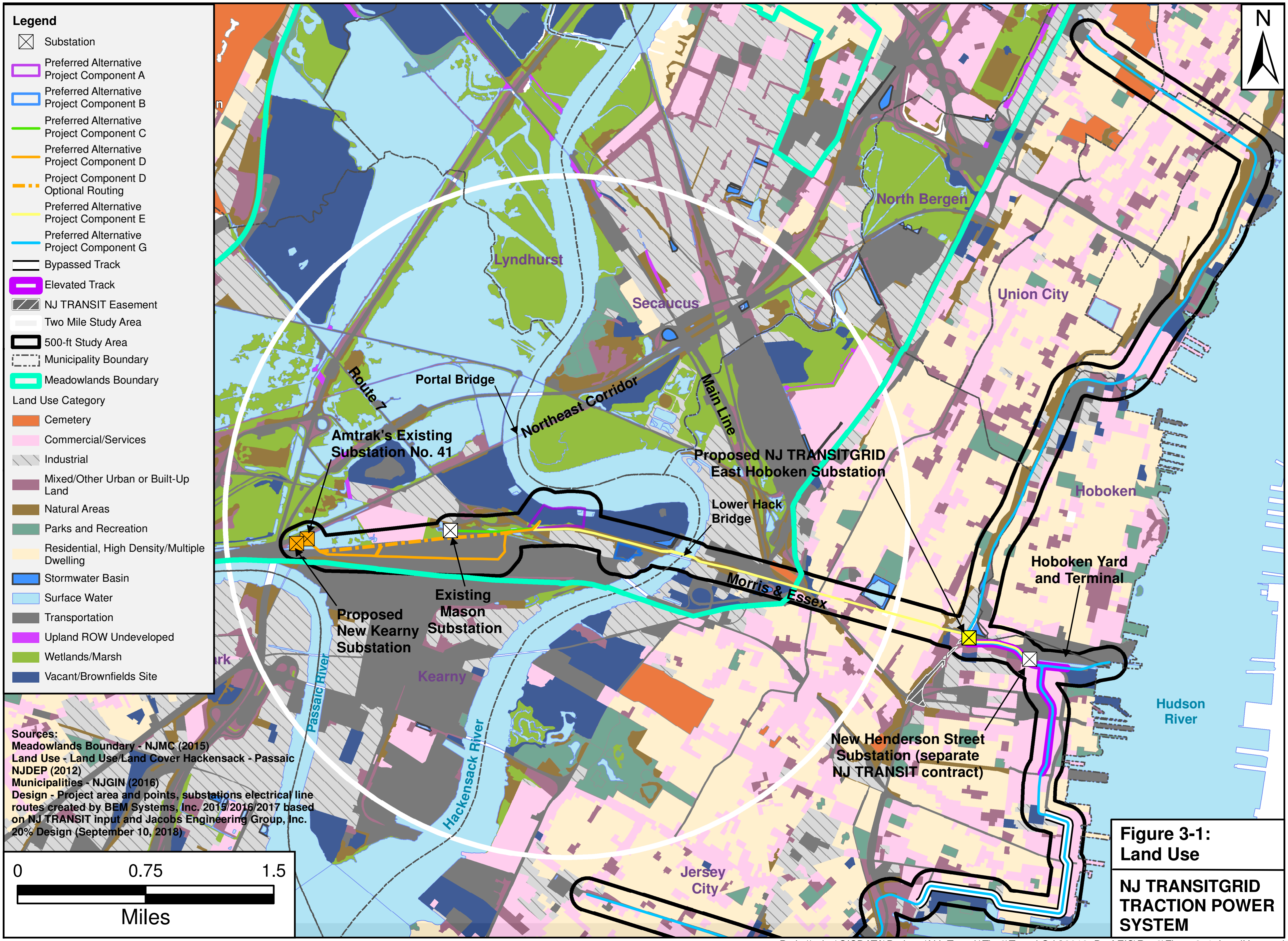

Figure 3-1: Land Use

NJ TRANSITGRID TRACTION POWER SYSTEM

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Figure 3-2: Land Use

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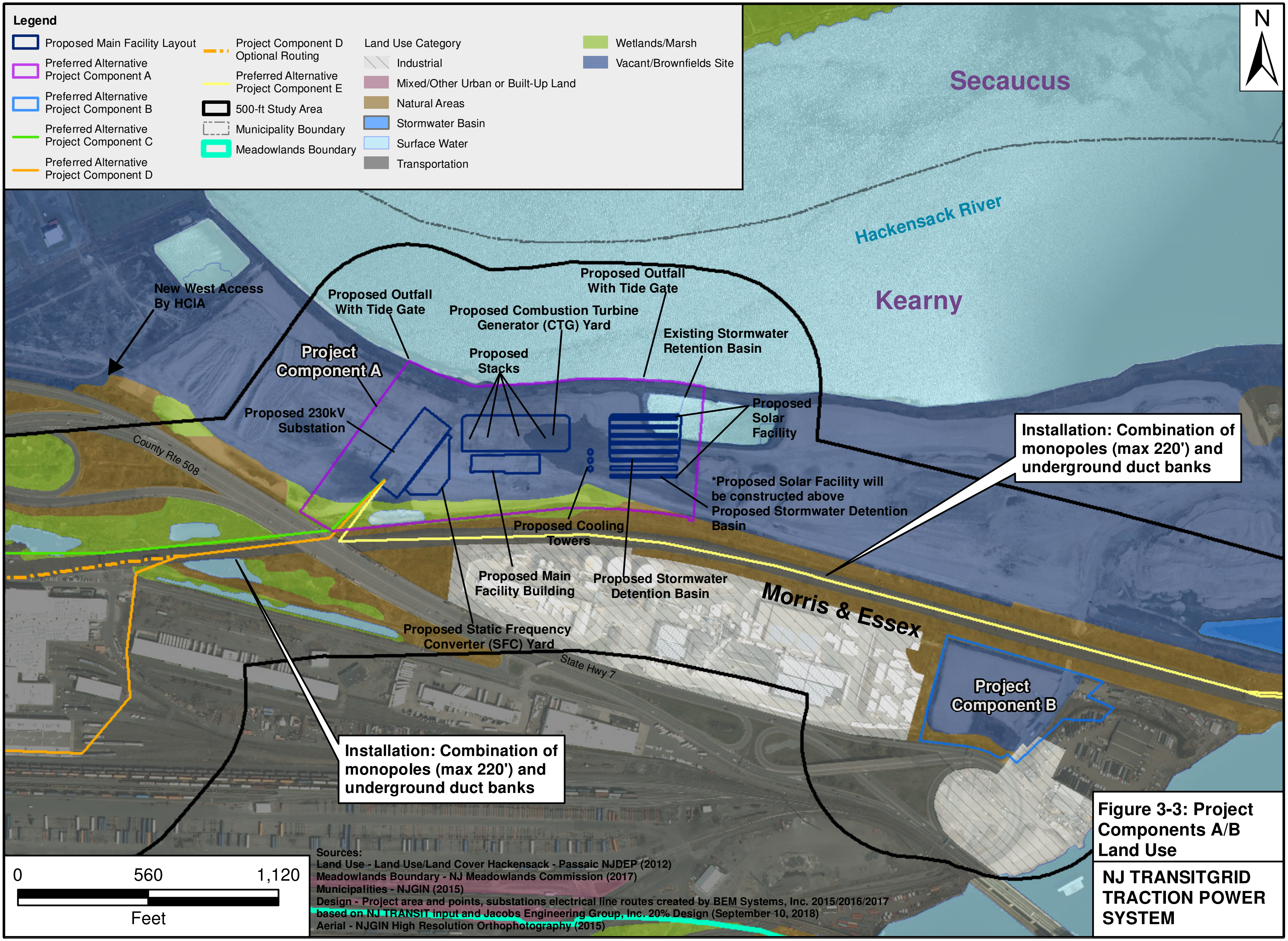

Figure 3-3: Project Components A/B Land Use

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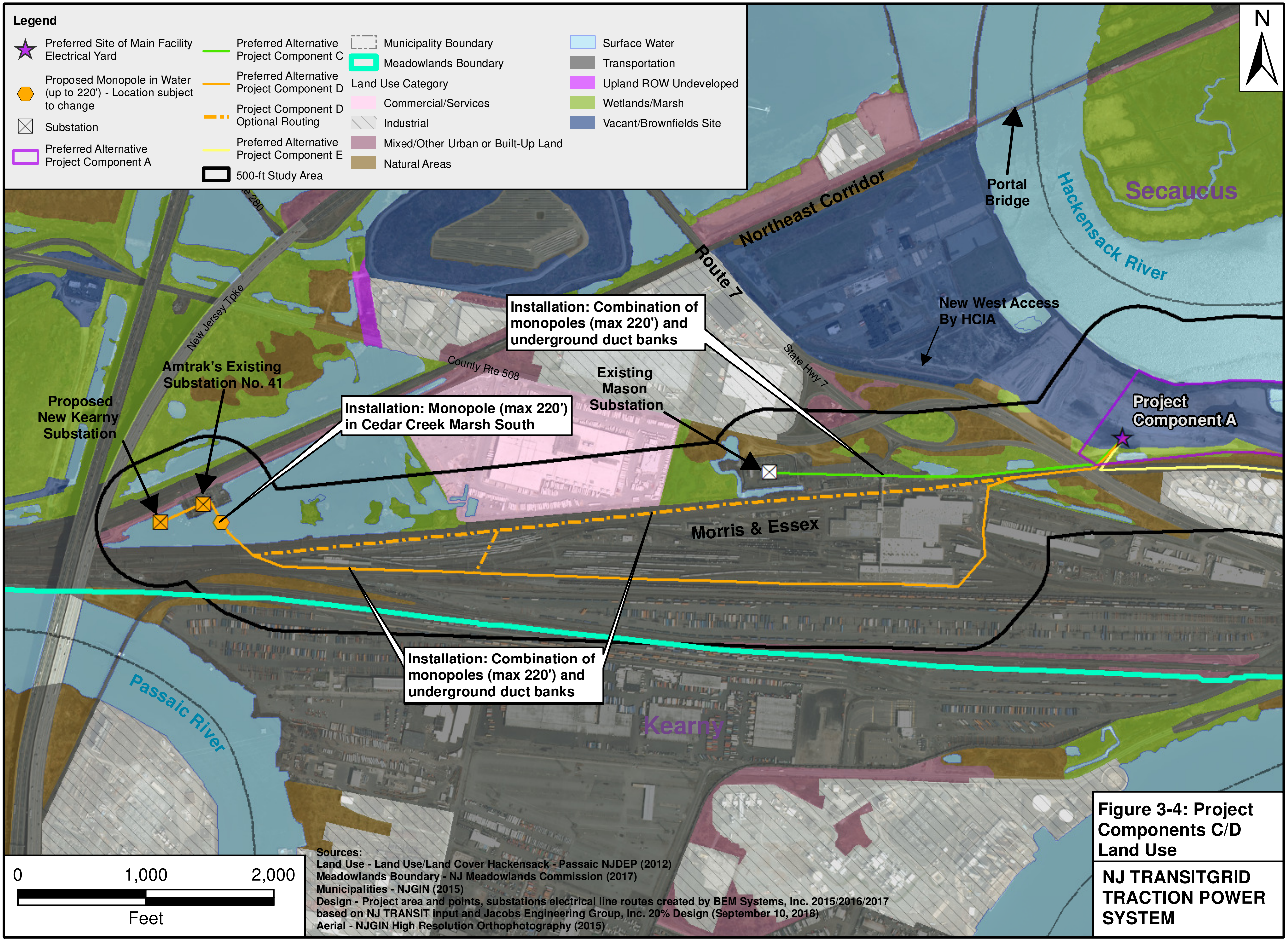

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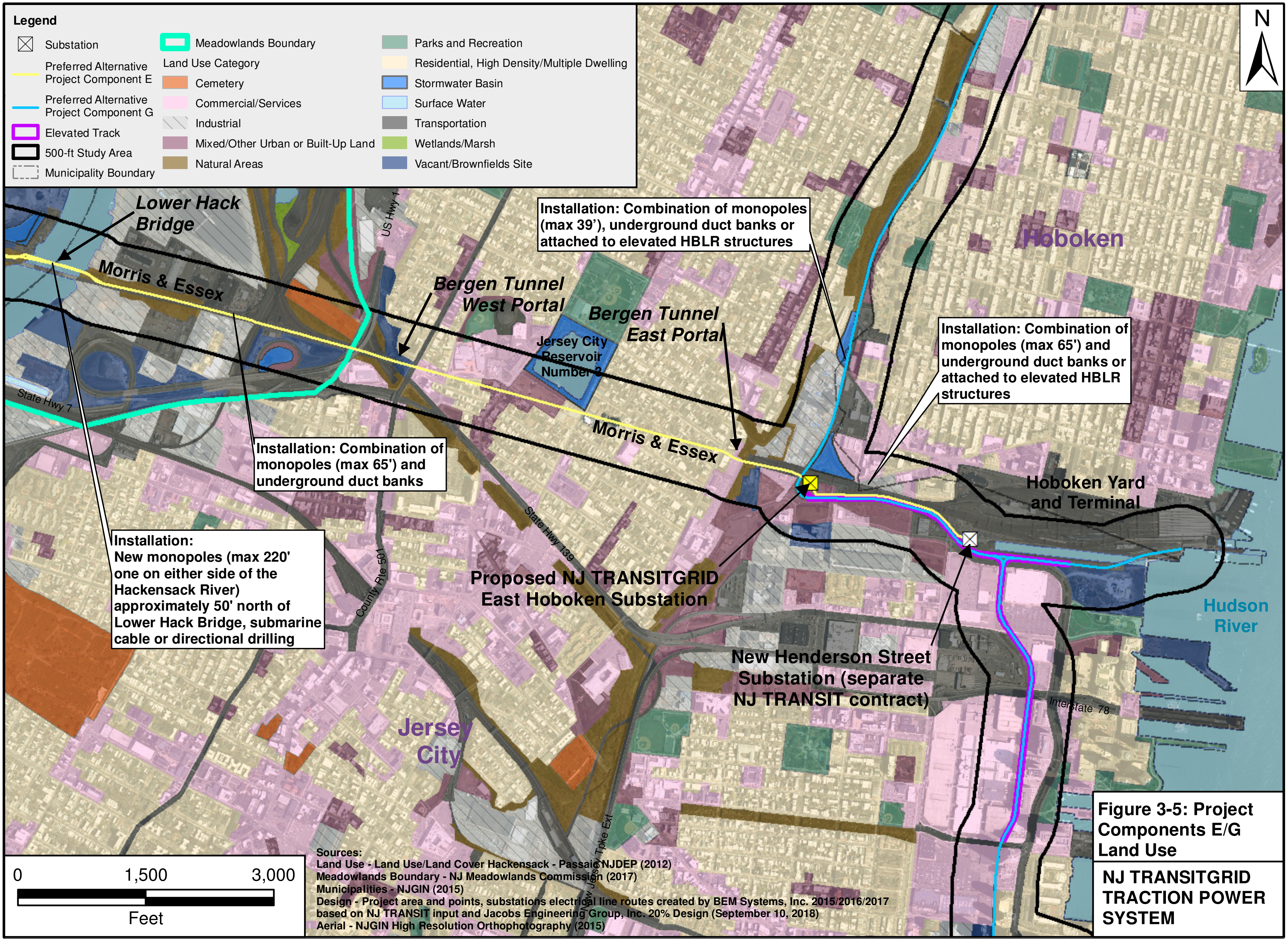

Figure 3-5: Project Components E/G Land Use

NJ TRANSITGRID TRACTION POWER SYSTEM

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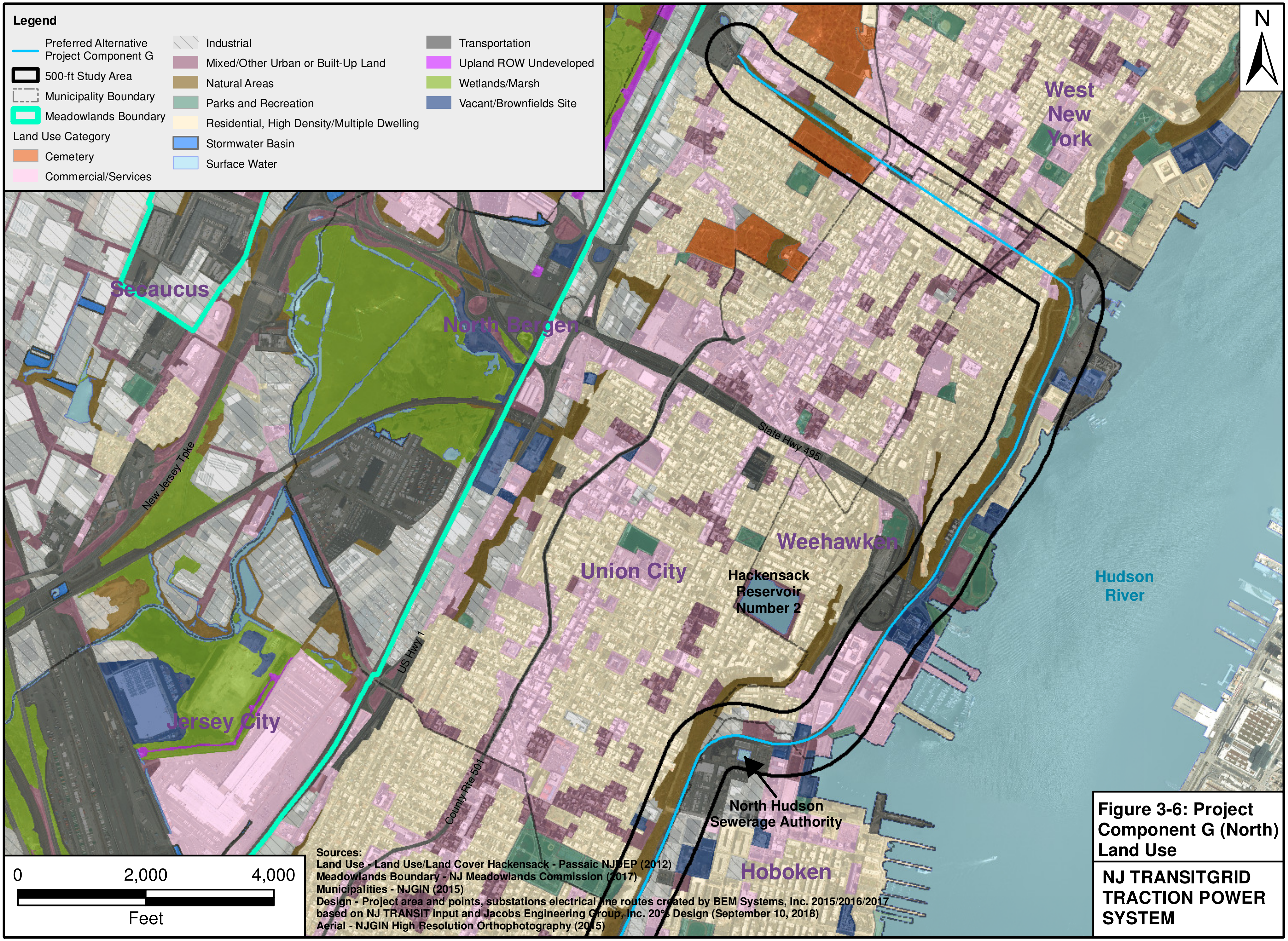

Figure 3-6: Project Component G (North) Land Use

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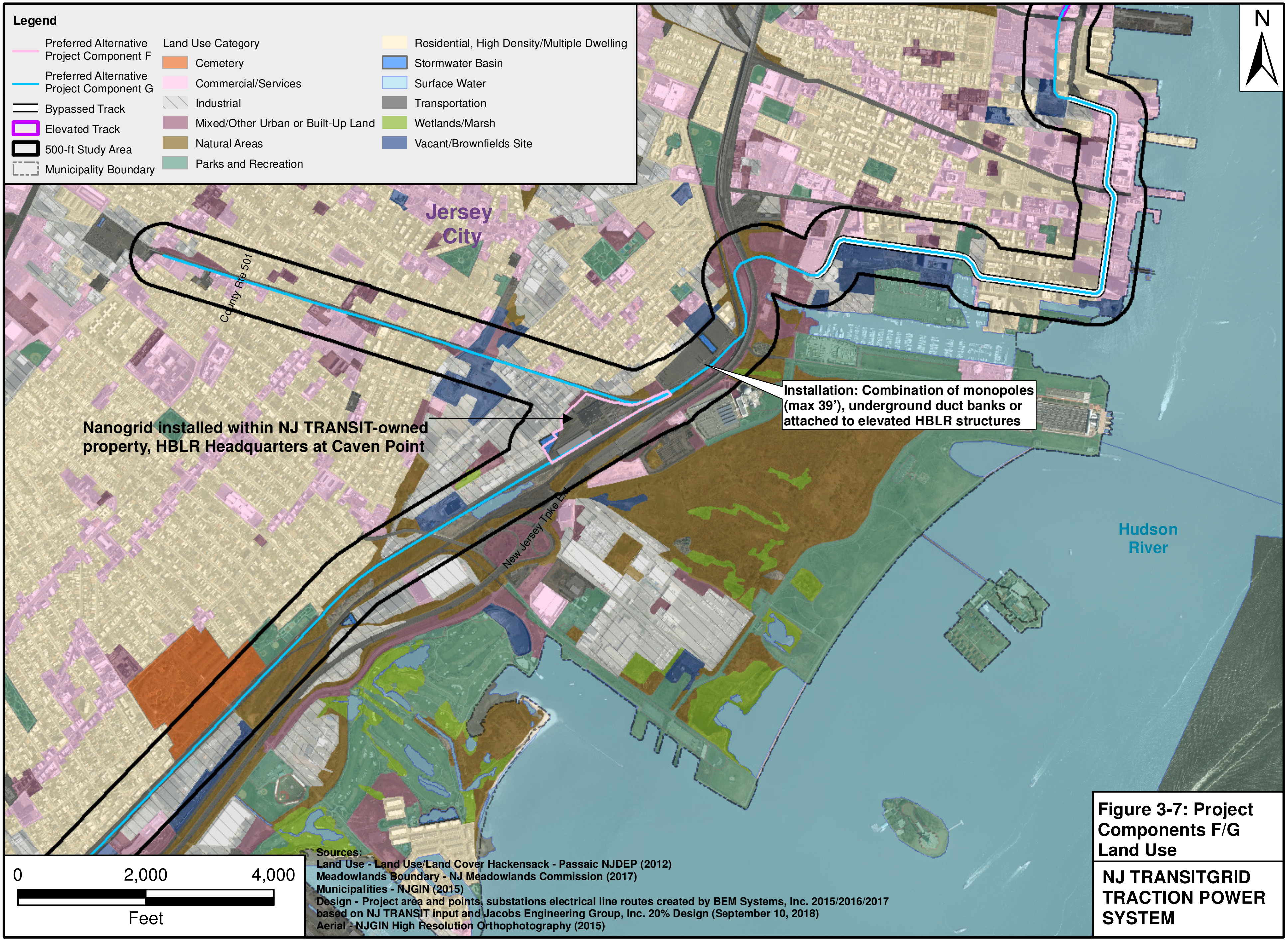

Figure 3-7: Project Components F/G Land Use

NJ TRANSITGRID TRACTION POWER SYSTEM

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Sources:
Land Use - Land Use/Land Cover Hackensack - Passaic NJDEP (2012)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
Municipalities - NJGIN (2015)
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)

Figure 3-8: Project Component G (South) Land Use

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure3_LandUse.mxd

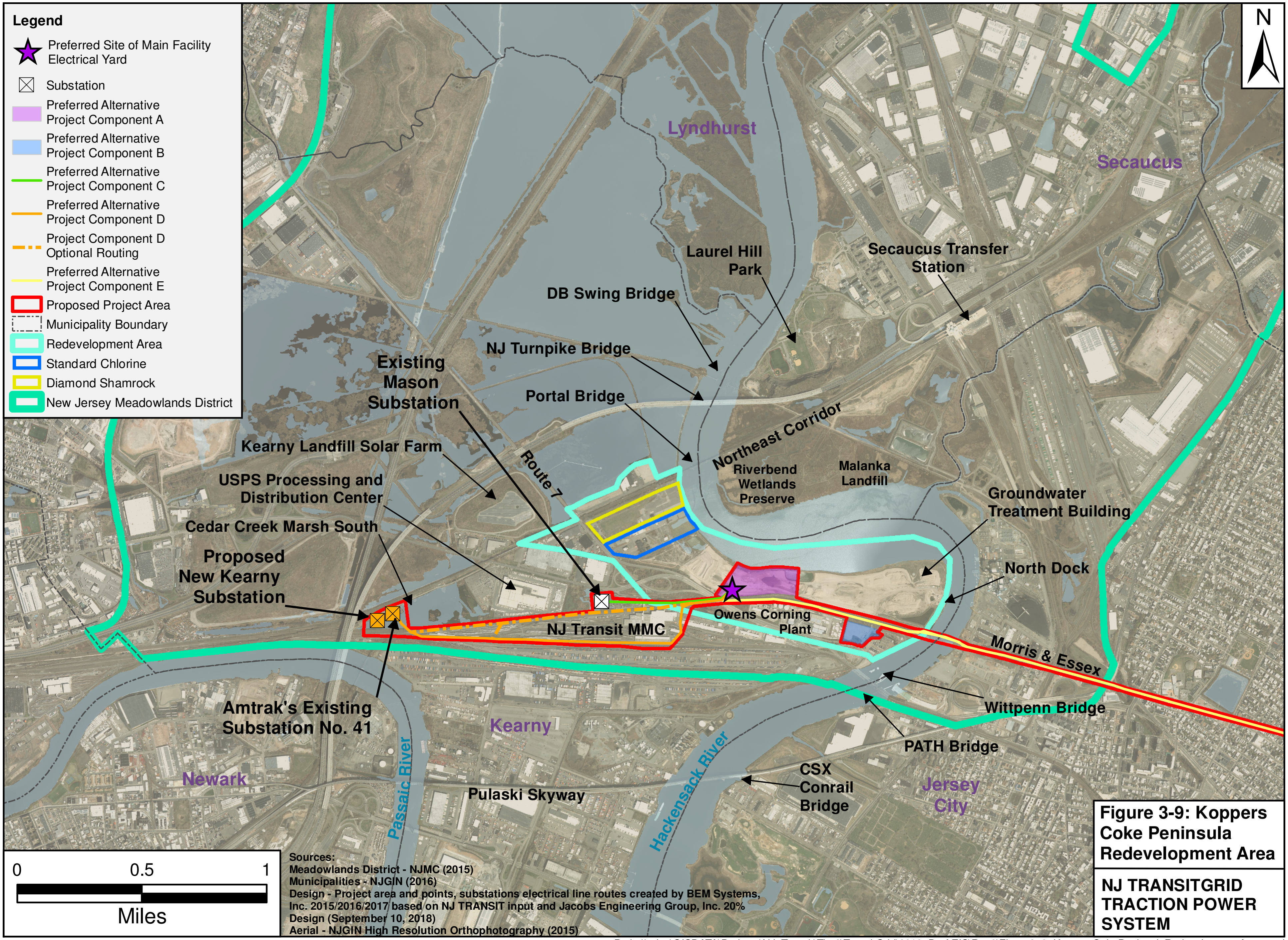

Figure 3-9: Koppers Coke Peninsula Redevelopment Area

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure3_9_KoppersCokePeninsulaRedevelopmentArea.mxd connects to Route 7. Both parcels are currently owned by HCIA. The large parcel was historically used for coke production and coal-tar processing. The Koppers Koke facility was constructed in 1917 and razed in 1979. The Koppers Koke Site includes Block 287, Lots 32.01, 54, 55, 56, 60, 61.02, 61.03, 62, 62.01, 63, 70, 70.01, 71, and 71.01. These block/lots are on the Known Contaminated Sites List (KCSL), maintained by the NJDEP to provide a record of sites with confirmed soil or water contamination at levels greater than the applicable cleanup criteria or standards. Bounded by the Hackensack River to the north and east, the Koppers Koke Site is generally flat, a result of recent site remediation efforts performed in accordance with an extensive Remedial Action Work Plan (discussed in detail in Chapter 14, "Contaminated Materials"). HCIA has prepared the site for redevelopment by placing processed dredged material (PDM) as a cap and to elevate the site. The Great Lakes Dredge & Dock Company (GLDD) operates a dredged material processing facility from the North Dock on the Hackensack River at the eastern end of the Koppers Koke Site. Two PSE&G high-voltage electrical towers are located on the site along the river, and a groundwater treatment building is located in the northeast portion of the site. NJ TRANSIT's Morris & Essex Line and Route 7 provide the southern boundary for the preferred site for the Main Facility (Project Component A) (see Figure 3-9).

The Koppers Koke Site is part of the Redevelopment Area, which encompasses approximately 367 acres and 74 former industrial properties that are either abandoned or vacant. These properties include the Owens Corning property and a liquid material receiving station and pipeline to the south of the Koppers Koke Site, and the Standard Chlorine Chemical Company (SCCC) and Diamond Shamrock properties to the northwest. The SCCC and Diamond Shamrock sites have extensive contamination and, together with the contiguous Koppers Koke Site, are considered brownfields sites—defined as "any former or current commercial or industrial site that is currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of a contaminant" (NJMC 2013). The SCCC site is also a Superfund site listed on the USEPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) database.

Several redevelopment projects within the Redevelopment Area are in the planning stages. Two notable planned projects include:

- Koppers Koke Site / Warehousing Development—HCIA is working with a developer to redevelop approximately 126 acres of the Koppers Koke Site into a warehousing facility. The planned project is anticipated to result in two million square feet of warehouse space, occupying three lots that flank Project Component A. This redevelopment will include utility improvements and a frontage road spanning the Koppers Koke Site with access to Route 7. On August 21, 2017, an agreement was signed between the Morris Kearny Associates, LLC and NJSEA, providing the rights to redevelop the site to Morris Kearny Associates, LLC. No construction is currently authorized. (NJSEA 2017)
- SCCC / Diamond Shamrock Sites—The Town of Kearny is working with a developer to redevelop the SCCC and Diamond Shamrock properties, located to the northwest of the Koppers Koke Site. The planned project includes redevelopment of approximately 50 acres for warehousing

purposes, potentially including one 849,000 square-foot building that would span the two parcels. As of the date of this report, the construction schedule is not known.

The route of the proposed electrical line for Preferred Alternative Project Component C travels along the Morris & Essex Line to the Mason Substation (Figure 3-4). To avoid existing utilities, under the preferred alternative, the electrical line for Project Component D would extend west from the Main Facility along the Morris & Essex Line and 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 and through Cedar Creek Marsh South to the existing Amtrak Substation No. 41 (total of 1.47 miles) (see Figure 3-4). As an optional routing, the electrical line could travel past Mason Substation through open water to the existing Amtrak Substation No. 41 in Cedar Creek Marsh South, (with possible brief south routing just before reaching the marsh) ending at the location of the new Kearny Substation. The study area for connectivity to the new Kearny Substation includes the rail yard that the electrical line will travel through. Existing land uses surrounding Preferred Alternative Project Components C and D, and the optional routing for Project Component D include the Cedar Creek Marsh South (surface water), a U.S. Postal Service processing and distribution center (commercial/services), Family Food Distributors (industrial), the MMC (transportation), and the CSX South Kearny Yard (transportation) (see Figure 3-4). Other land uses in this portion of the Project area include surface water, vegetated areas, and partially vegetated areas (designated by NJDEP as “up to 25% brush covered lands”). See Chapter 12, “Natural Resources,” for detailed discussion of the natural environment (i.e., vegetation, wetlands, and waters) within the project area.

The electrical line route for Preferred Alternative Project Component E follows the existing railroad right-of-way and extends east from the Main Facility site across the Hackensack River, continuing through an industrial section of Jersey City and past historic Saint Peter’s Cemetery to an intersection with John F. Kennedy Boulevard. Past John F. Kennedy Boulevard, the Preferred Alternative Project Component E electrical line route enters NJ TRANSIT’s Bergen Tunnel beneath neighborhoods dominated by residential and commercial uses (see Figure 3-3 and 3-5). Upon exiting the Bergen Tunnel, the electrical line would continue along the Morris & Essex Line through a transportation corridor and connect the new NJ TRANSITGRID East Hoboken Substation to the Henderson Street Substation, the line would be divided with a feeder headed north on the HBLR easement (Preferred Alternative Project Component G), and a feeder headed east to feed Hoboken Yard and a small section of the HBLR in Jersey City. The NJ TRANSIT-owned HBLR Headquarters property on Caven Point Avenue is also included in the study area for the proposed nanogrid (Preferred Alternative Project Component F). Several mixed-use developments are planned near Preferred Alternative Project Component E, near the Bergen Tunnel East Portal. According to the City of Jersey City’s Hoboken Avenue Redevelopment Plan (Jersey City 2015), the Hoboken Brownstone Company has plans to redevelop several properties near Hoboken Avenue and Monmouth Street:

- The former Van Leer Chocolate Factory site is being redeveloped into a residential condominium complex with a 1.5-acre public park. The two-phase project will entail two, six story apartment buildings with 568 residential units, 7,500 square feet of retail space, and parking. Construction is currently planned for completion in 2019 (Hoboken Brownstone Company 2017). This project is included under the Cumulative Effects analysis as part of Chapter 18, "Indirect and Cumulative Effects.

- Along Coles Street, about 5.5 acres of land is expected to be redeveloped into a large mixed-use development with a two-acre public park. The project is reported to include 1,181 residential units, about 90,000 square feet of retail space, and parking. The project received local Jersey City planning approvals in 2016, but the project has not commenced construction. No construction dates are currently available. (Hoboken Brownstone Company 2017)

Land uses along Preferred Alternative Project Component E are primarily transportation-related. Uses within the 500-foot buffer of Preferred Alternative Project Component E include vacant/brownfields sites, stormwater basins, industrial, commercial/services, mixed/other urban or built-up land, vegetation, surface water, residential (high density/multiple dwelling), cemetery, and up to 25% brush-covered land. Land uses over the Bergen Tunnel, which would not be impacted by the electrical line installation, include residential (high density/multiple dwelling), commercial/services, stormwater basin, and surface water Within the 500-foot buffer for Preferred Alternative Project Component F, land uses include commercial/services, mixed/other urban or built-up land, transportation, stormwater basin, industrial, and residential (high density/multiple dwelling).

Land uses within the 500-foot buffer for Preferred Alternative Project Component G in North Bergen are predominately industrial, commercial/services, residential, natural areas (vegetated buffers), and cemetery. Continuing east, the mapped land use of the study area in Union City and West New York includes commercial/services, residential, and transportation. As the HBLR alignment navigates south through Weehawken, adjacent land uses include primarily transportation, parks, and natural areas (vegetative buffers), with commercial, residential, industrial, and other uses nearby. To the south, where the HBLR alignment follows the border of Union City and Hoboken, the surrounding land uses are industrial (including a large bus depot and wastewater treatment plant), natural areas (vegetative buffers), commercial/services, and some residential areas. As the HBLR alignment continues south through Jersey City, the land uses vary but are predominately commercial/services, residential, park/open space, and industrial. Continuing south, land uses in the Bayonne portion of the study area include residential, industrial, commercial/services, and transportation.

<u>Two-Mile Study Area</u>

The two-mile study area is centered on the Main Facility site (Preferred Alternative Project Component A) and includes portions of Lyndhurst (Bergen County), Newark (Essex County), Kearny, Secaucus, and Jersey City (Hudson County). Much of the two-mile study area, including the Redevelopment Area, lies within the New Jersey Meadowlands District. The Hackensack River and the NJ TRANSIT Morris & Essex Line roughly divide the area into quadrants (see Figure 3-1).

The northwest quadrant (Lyndhurst and Kearny) is dominated by open water and wetland areas. It also contains numerous transportation rights-of-way and major roadways, Amtrak's Northeast Corridor, several landfills, warehouses, and brownfield redevelopment properties (including the Diamond

Shamrock and SCCC sites referenced above). The Kearny Landfill Solar Farm is a 3MW installation operated by PSE&G on a 13-acre section of a closed landfill known as “Landfill 1A.”

The southwest quadrant (Kearny and Newark) is dominated by rail yards, industrial uses, and utilities. These include NJ TRANSIT’s MMC and the CSX South Kearny Yard. There are no residential areas in this quadrant. The Hudson County Correctional Facility is located on South Hackensack Avenue in the southern portion of the Kearny Peninsula. Two of the three power generation facilities that are located within the two-mile study area are located in this quadrant: the PSE&G Fossil Kearny Generating Station (a 452MW gas-fired combustion turbine power generating station and retired 1925 power plant building), and the 81MW PSE&G Fossil Essex Generating Station, which is located across the Passaic River, in a heavy industrial area known as “Point No Point” in Newark (see Figure 3-10).

The northeast quadrant (Secaucus and Jersey City) is a mix of vegetation, recreational, transportation, industrial, vacant and residential and commercial areas. The 620MW PSE&G Fossil Hudson Generating Station is located along the Hackensack River in Jersey City (see Figure 3-10). Norfolk Southern’s Croxton Intermodal Terminal is located in Jersey City, adjacent to the NJ International and Bulk Mail Center. A residential Jersey City neighborhood referred to as “The Heights” is located east of Tonnelle Avenue. Land uses in the Secaucus portion include the Northeast Corridor, Riverbend Wetland Preserve, the former Malanka Landfill, the Frank R. Lautenberg Secaucus Transfer Station and an associated residential complex, and Laurel Hill Park (see Figure 3-9).

The southeast quadrant (Jersey City) is a mix of industrial, vacant, and other uses along the waterfront and parks, residential, and commercial areas towards inland areas. The Holy Name Cemetery and the 150-acre Lincoln Park are located in this quadrant. Residential and commercial areas are present east of U.S. Route 1/9 and Route 440.

3.3.2 Zoning and Public Policy

Zoning designations for the study areas for Project Components A through G are shown on Figures 3-11 through 3-16 and reflect the zoning codes of the individual municipalities except within the Meadowlands District, where the District’s zoning supersedes the local designation. Furthermore, within the designated Redevelopment Area, the Redevelopment Plan supersedes NJSEA prior zoning.

<u>Project Study Area Plus 500-Foot Buffer</u>

With the exception of the eastern portion of Preferred Alternative Project Component E and all of Preferred Alternative Project Components F and G, this study area lies within the Meadowlands District (formerly known as the Hackensack Meadowlands). The Meadowlands District encompasses about 32 square miles in Bergen and Hudson Counties, of which approximately 13 square miles are wetlands, waterways, and open space. The NJSEA, which recently incorporated the MRC, formerly the NJMC, is charged with environmental protection and stewardship and promoting orderly development in the Meadowlands District.

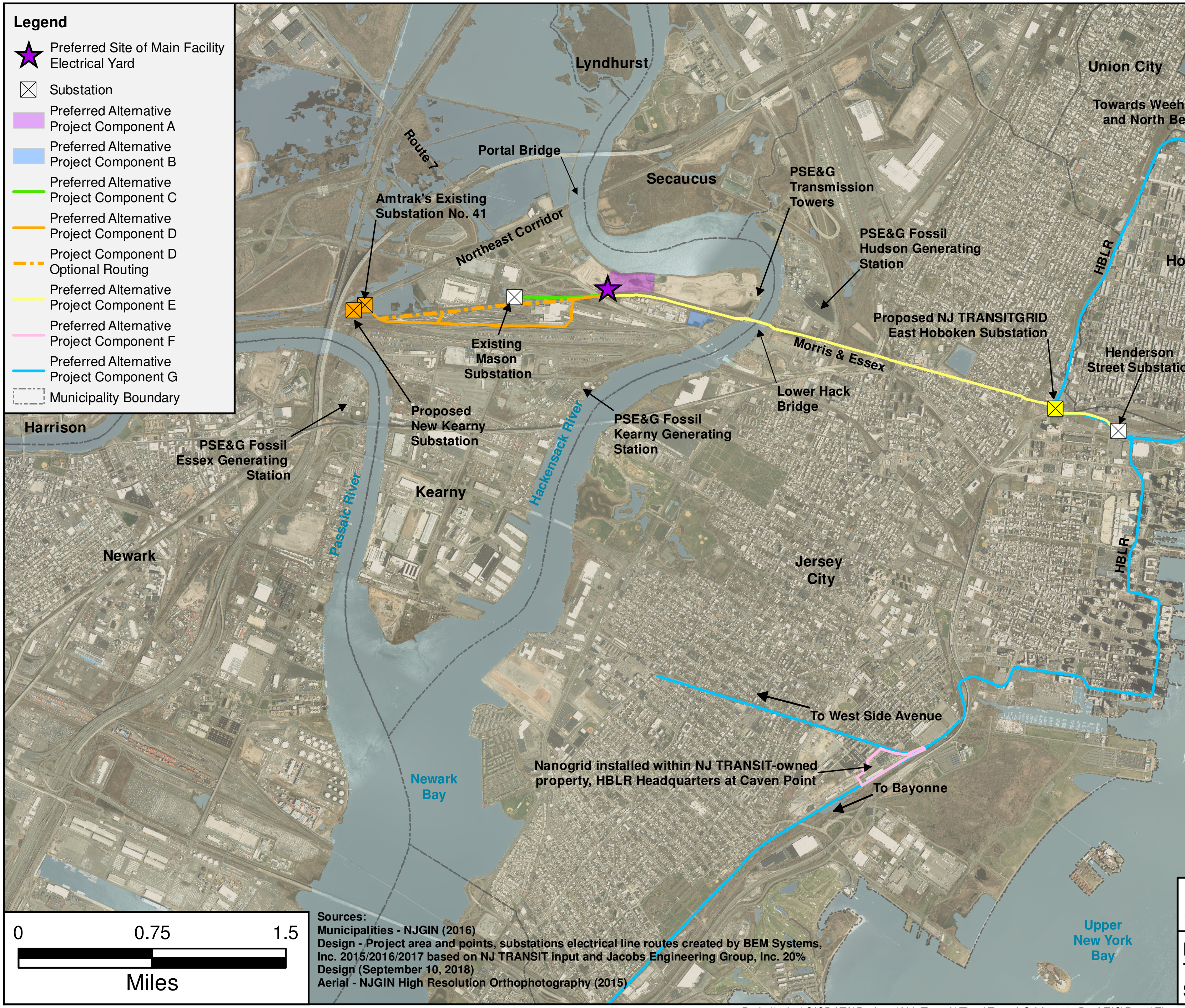

Figure 3-10: Power Generating Facilities

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Most of the area surrounding Project Components A, B, C, and D (including all options for Project Component D) is zoned as intermodal (see Figures 3-11 and 3-12). The area around Amtrak's Substation No. 41, including the location of the new Kearny Substation (Preferred Alternative Project Component D), is a designated Environmental Conservation Zone, which consists of areas designated for open space and habitat protection and enhancement, including wetland restoration and/or mitigation and potential wildlife management areas, and a Redevelopment Area is present at the western end of the 500-foot study area. Areas of Preferred Alternative Project Component E within the Kearny Peninsula are designated intermodal, until the electrical line route reaches the Hackensack River. The Preferred Alternative Project Component E electrical line route passes through the Meadowlands District Heavy Industrial zone in Jersey City and a Jersey City Highway Commercial zone prior to entering the Bergen Tunnel. Within the 500-foot buffer, areas are also zoned for Park/Open Space, Transportation, and Residential Redevelopment (see Figure 3-13). Upon exiting the tunnel portal on the Morris & Essex Line's right-of-way, the 500-foot buffer zone includes portions of Jersey City's Redevelopment Area, and Hoboken Industrial zones (see Figure 3-13). Areas are also zoned as Medical, Residential and Transportation in Jersey City.

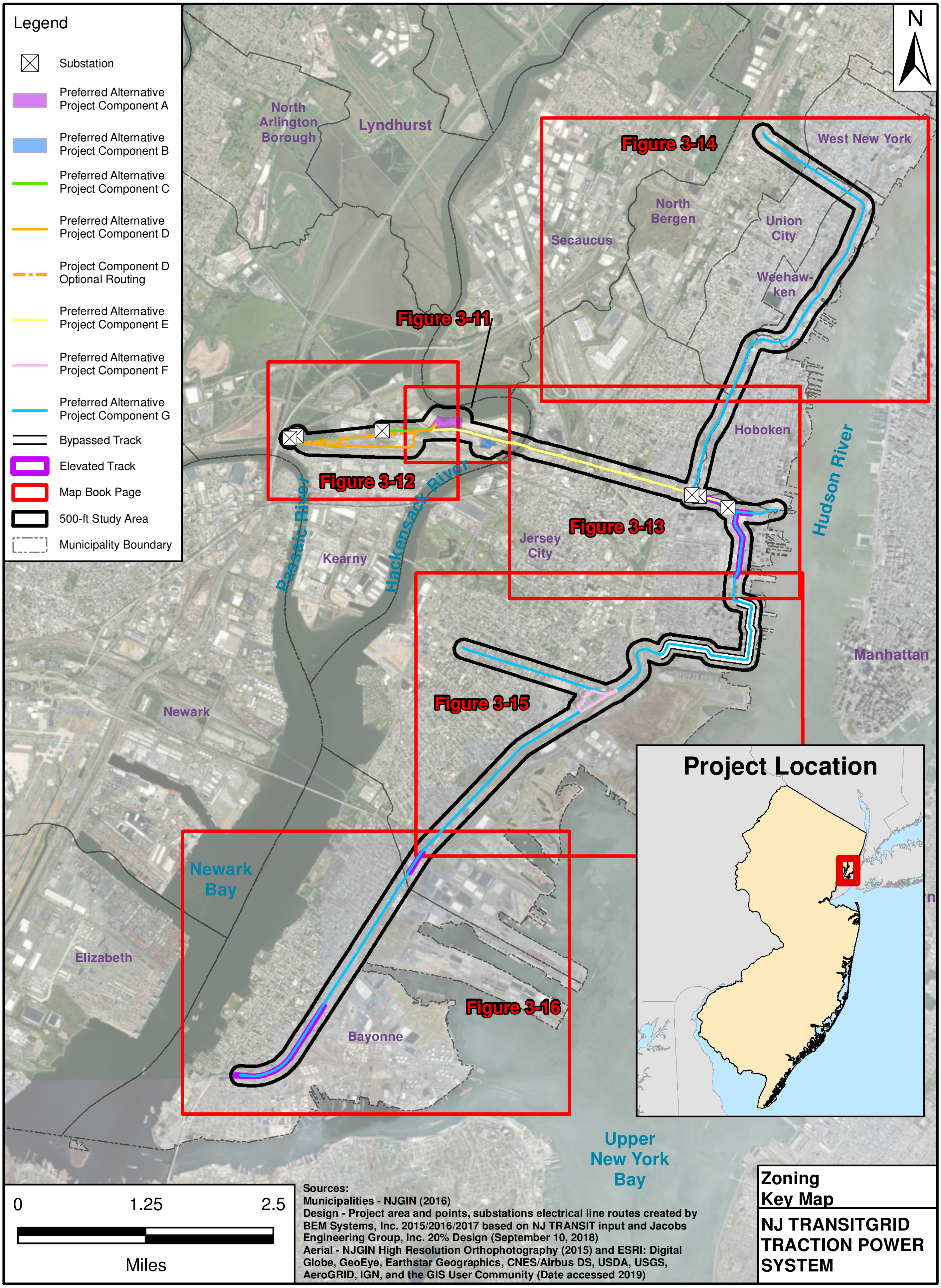
Preferred Alternative Project Component F consists of a smaller "nanogrid" that would be installed on NJ TRANSIT-owned property at the HBLR Headquarters on Caven Point Avenue in Jersey City. The nanogrid would consist of two approximately 2MW generators driven by natural gas reciprocating engines and will supply power to the southern half of the HBLR during emergencies. 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. The 500-foot buffer of Preferred Alternative Project Component F includes Redevelopment Areas (see Figure 3-14).

For Preferred Alternative Project Component G, from Tonnelle Avenue in North Bergen, the HBLR travels east toward Bergenline Avenue. The study area within North Bergen is zoned Commercial, Residential, Developed Area and Park/ Open Space. From Bergenline Avenue in Union City, the HBLR alignment continues east to the Weehawken Tunnel, where the HBLR is below ground through Union City, and surfaces west of Port Imperial in Weehawken. The study area extends into the southern portion of West New York. Zoning within the study area (above the Weehawken Tunnel) through Union City includes: Redevelopment Area, Industrial, Park/ Open Space, Commercial and Developed Space.

From Port Imperial, the HBLR alignment continues south through Weehawken, Hoboken, and Union City, toward Hoboken Terminal. The study area extends into the western border of Hoboken. The zoning in this area includes Redevelopment Area, Industrial, Park/ Open Space, Commercial and Historic District.

West and south of Hoboken Terminal, the HBLR alignment travels through Jersey City toward 45th Street, with a western spur terminating at West Side Avenue. The zoning in this area includes Redevelopment Area, Industrial, Park/ Open Space, Commercial and Historic District.

From 45th Street, the HBLR alignment continues south through the City of Bayonne toward the southern terminus at 8th Street. A large portion of the study area is zoned as Residential, Commercial, Industrial and Redevelopment Area.



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)

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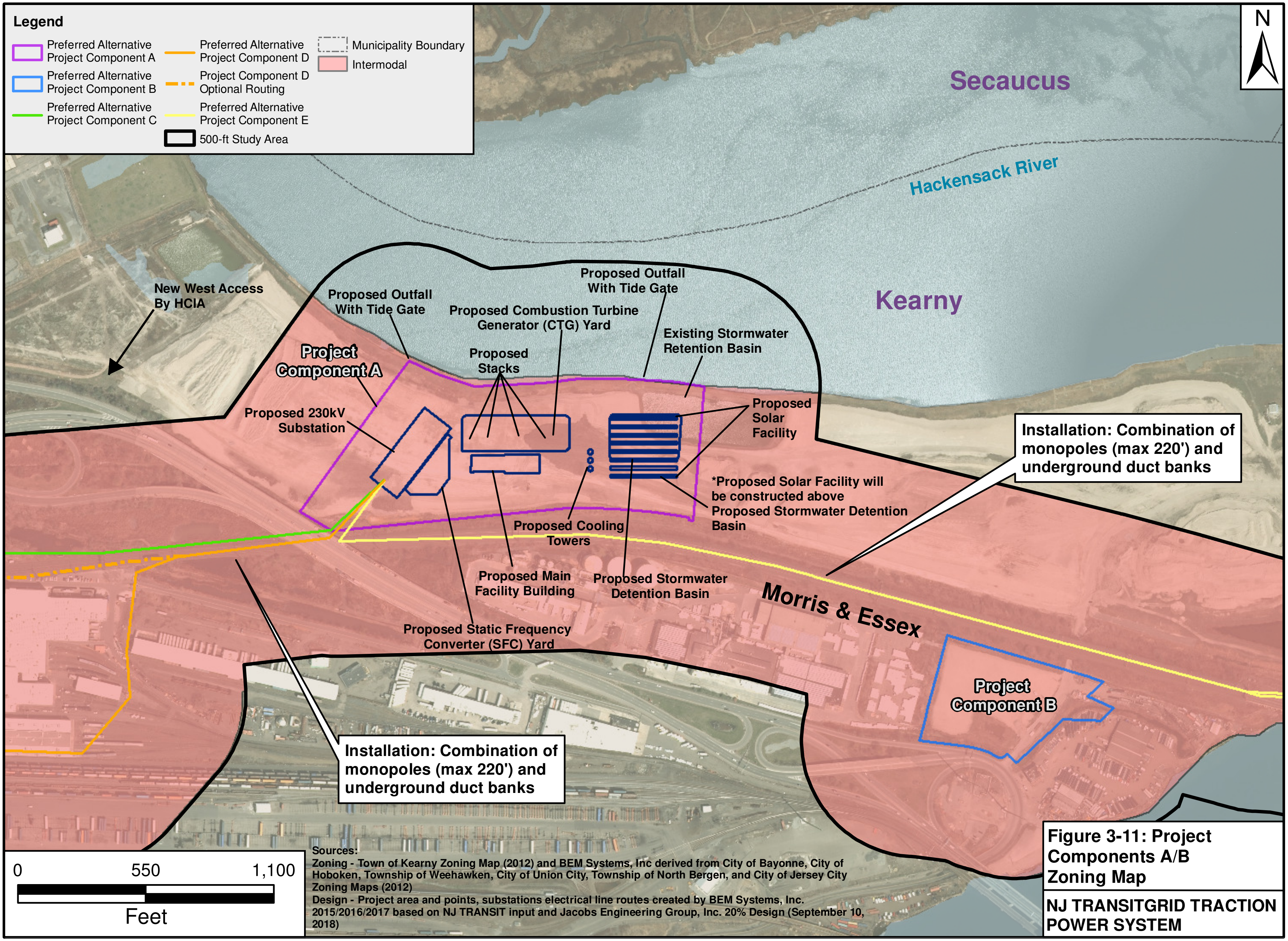

Figure 3-11: Project Components A/B Zoning Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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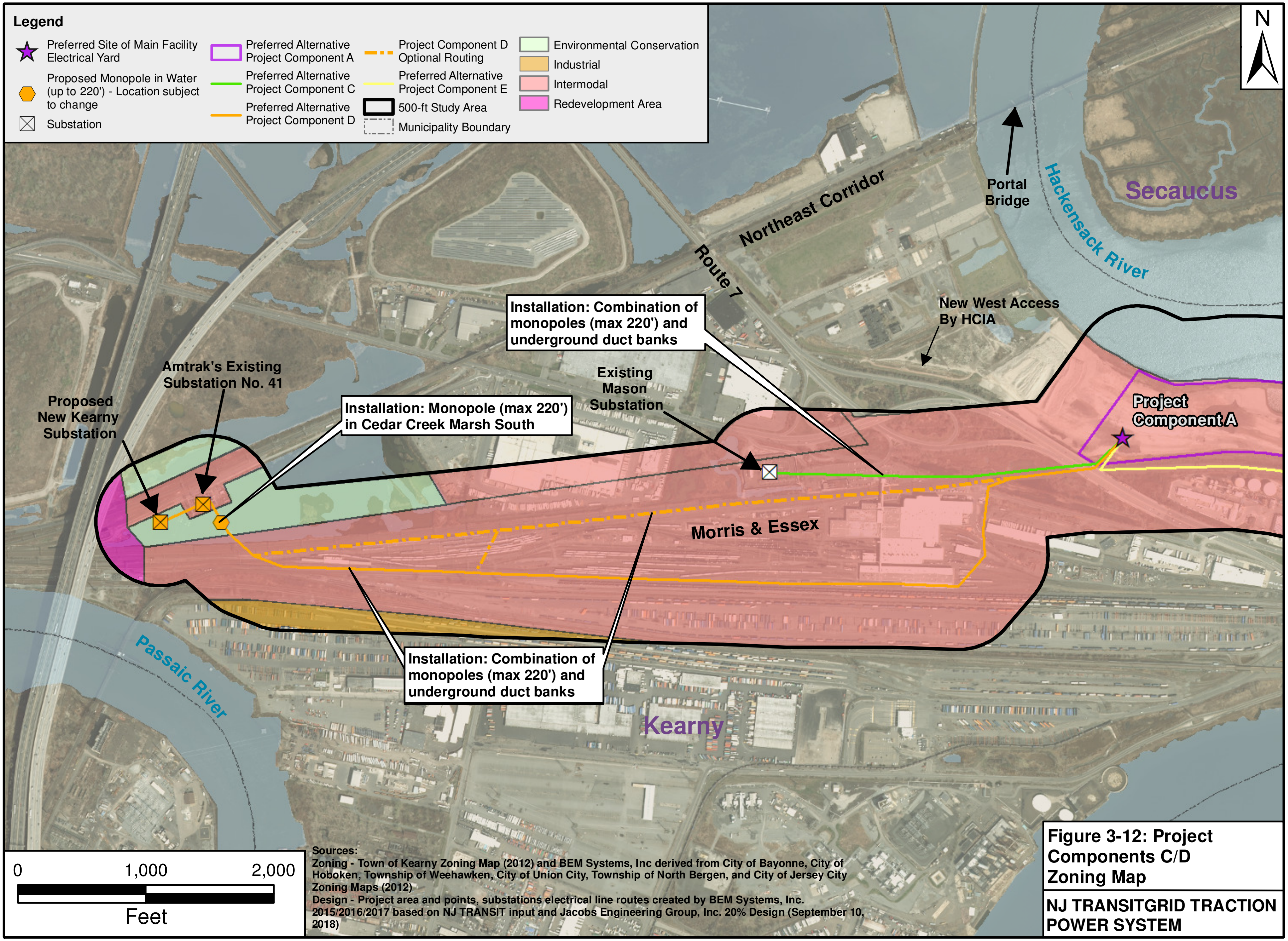

Sources:
Zoning - Town of Kearny Zoning Map (2012) and BEM Systems, Inc derived from City of Bayonne, City of Hoboken, Township of Weehawken, City of Union City, Township of North Bergen, and City of Jersey City Zoning Maps (2012)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)

Figure 3-12: Project Components C/D Zoning Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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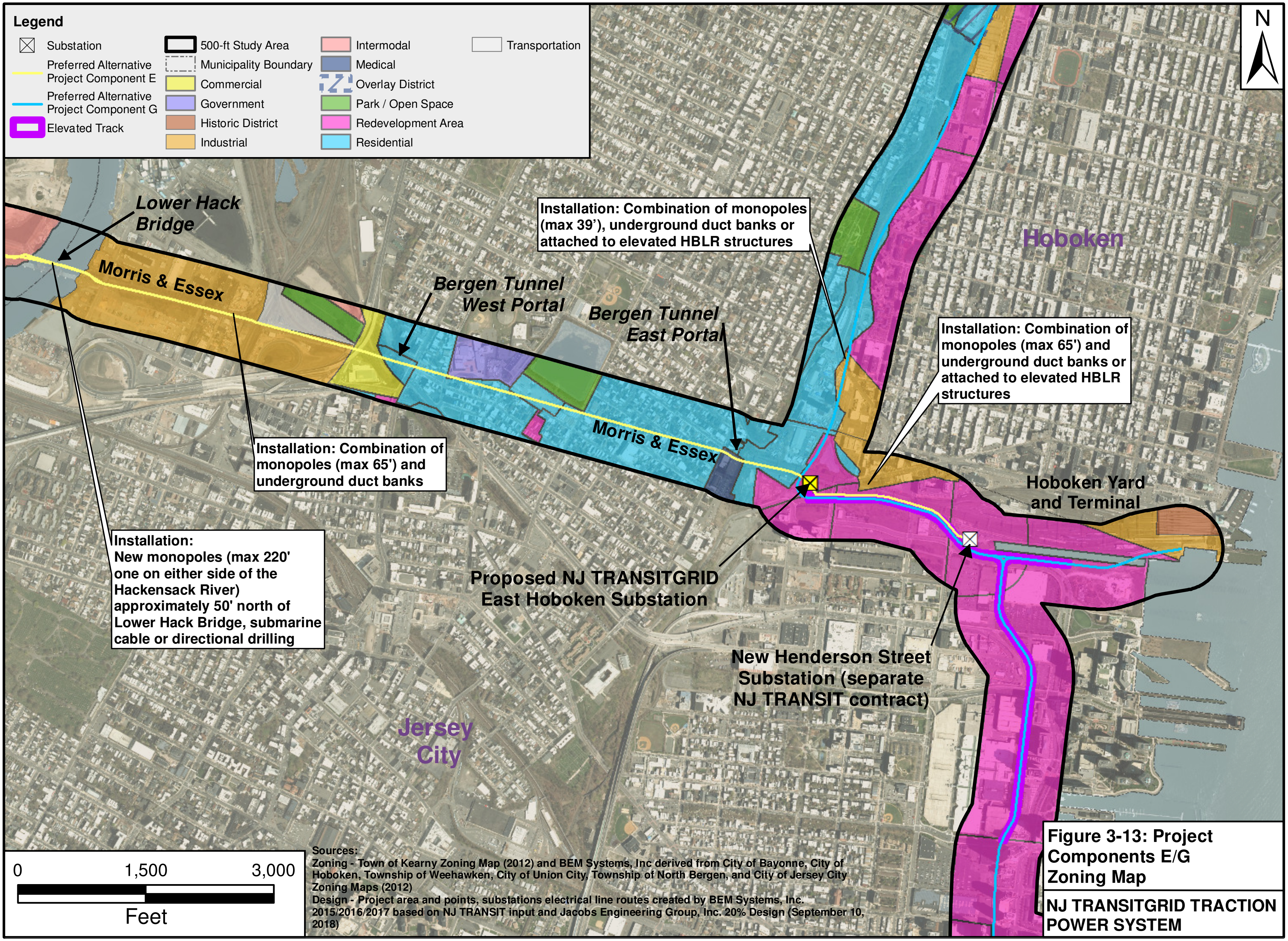

Figure 3-13: Project Components E/G Zoning Map

NJ TRANSITGRID TRACTION POWER SYSTEM

Sources:
Zoning - Town of Kearny Zoning Map (2012) and BEM Systems, Inc derived from City of Bayonne, City of Hoboken, Township of Weehawken, City of Union City, Township of North Bergen, and City of Jersey City Zoning Maps (2012)
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)

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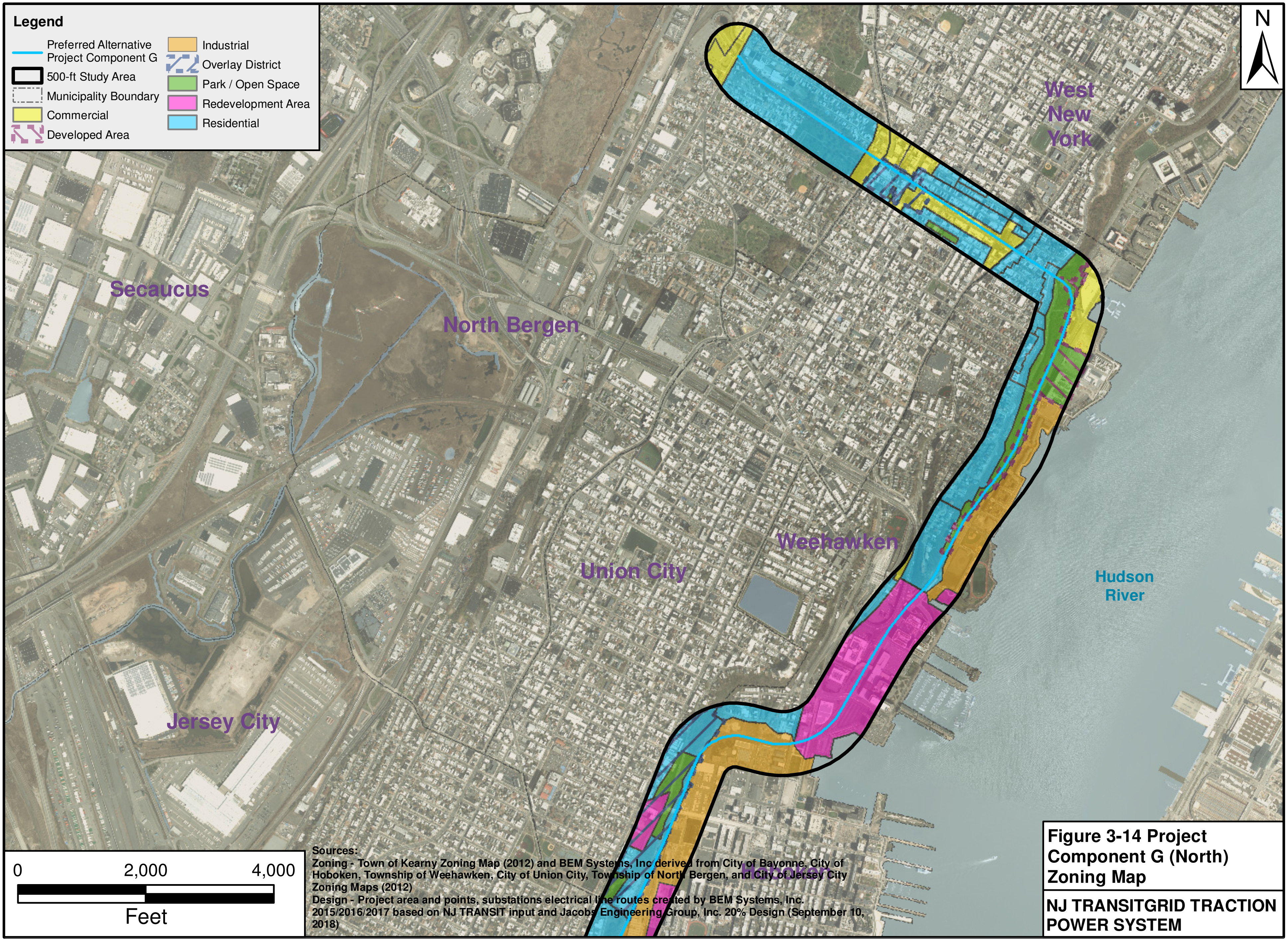

Figure 3-14 Project Component G (North) Zoning Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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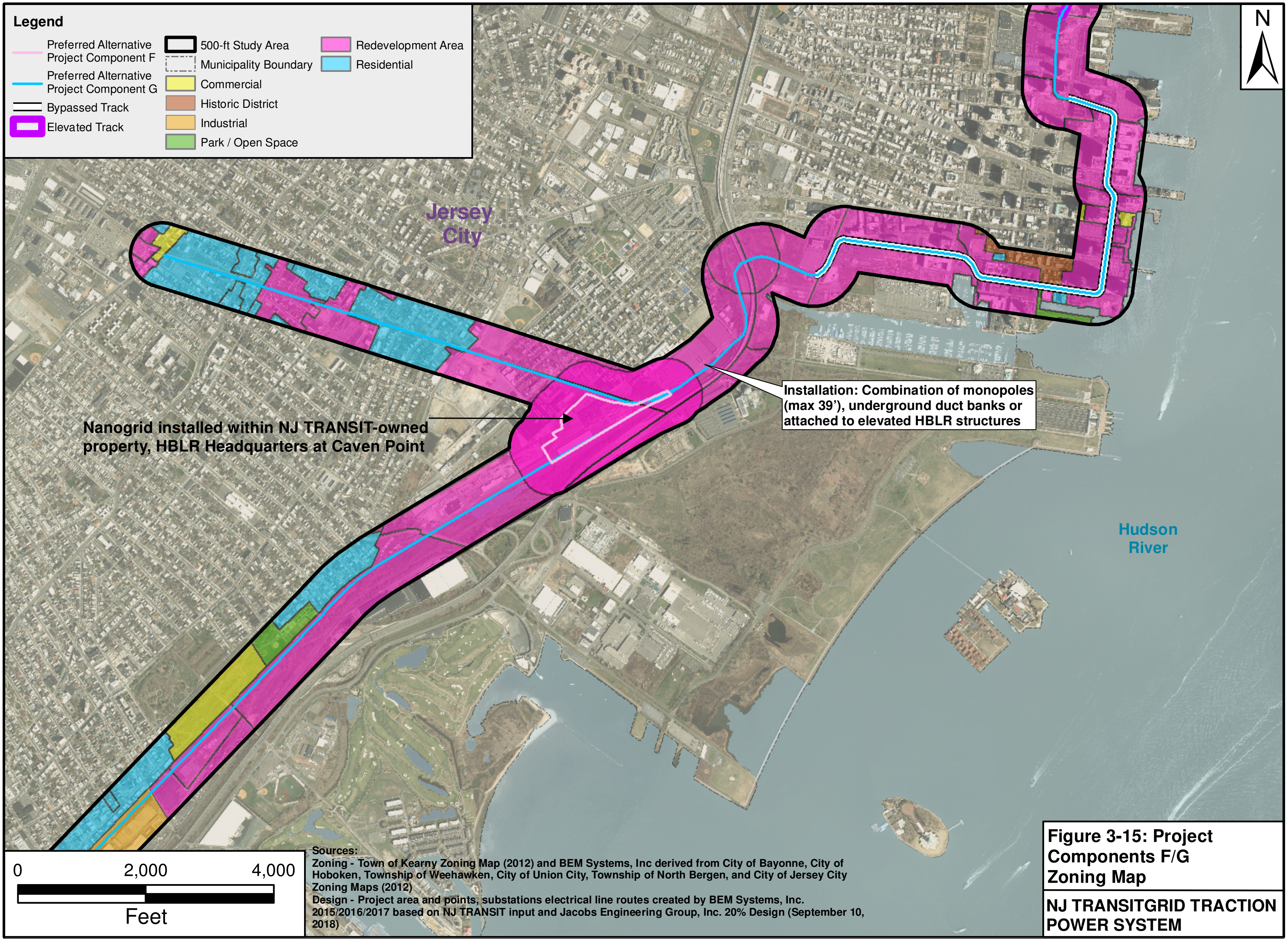

Figure 3-15: Project Components F/G Zoning Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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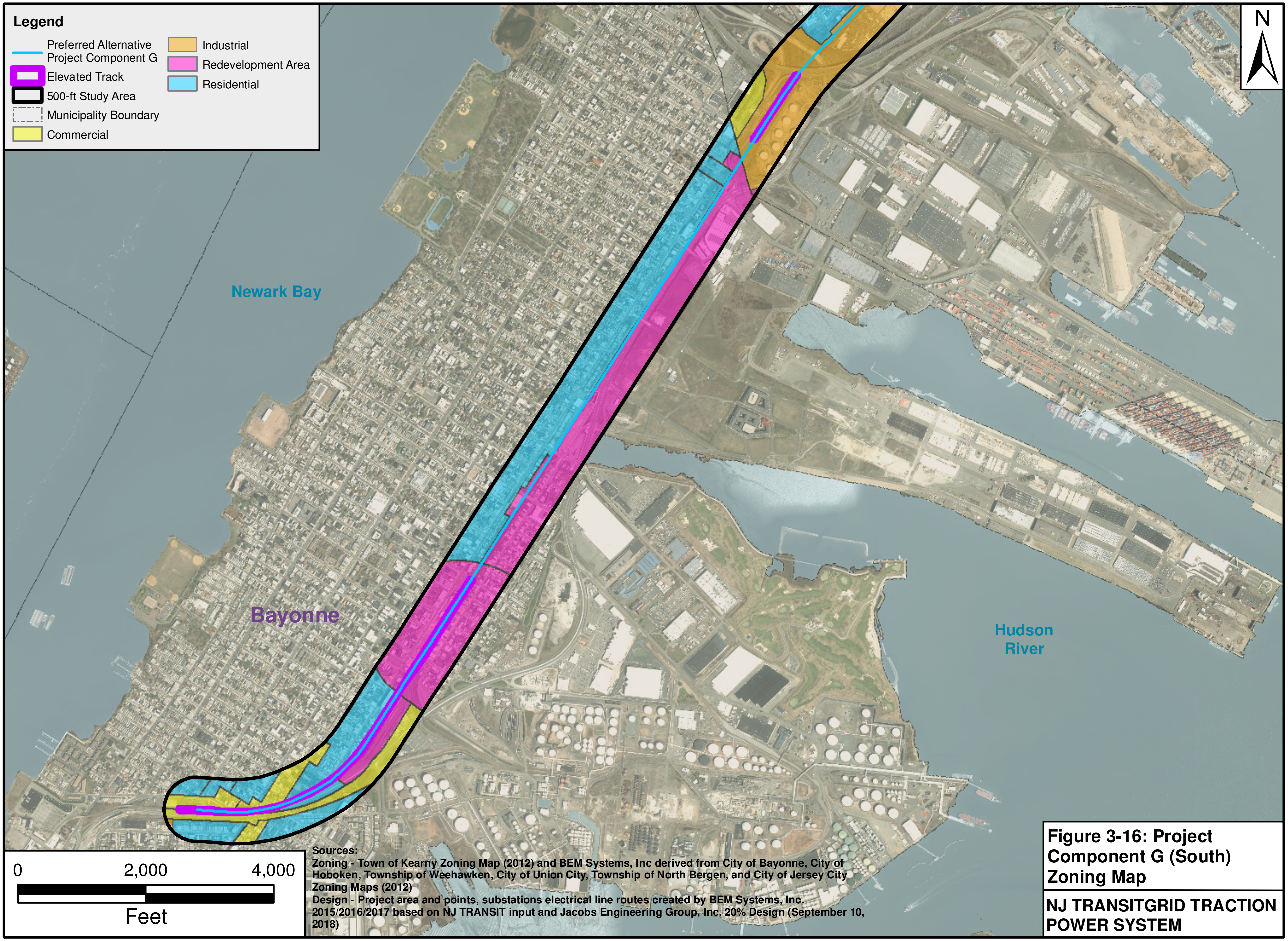

Sources:
Zoning - Town of Kearny Zoning Map (2012) and BEM Systems, Inc derived from City of Bayonne, City of Hoboken, Township of Weehawken, City of Union City, Township of North Bergen, and City of Jersey City Zoning Maps (2012)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)

Figure 3-16: Project Component G (South) Zoning Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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Zoning changes are not required or expected to result from the activities associated with Preferred Alternative Project Component G, as the existing light rail has operated along the alignment since 2000, and the land use and layout of the alignment would not change as a result of Preferred Alternative Project Component G. The proposed electrical lines associated with Preferred Alternative Project Component G would be installed within the existing transportation right-of-way where electrical lines are currently prevalent. No significant adverse impacts to zoning are expected under Preferred Alternative Project Component G.

Land development on the Koppers Koke Site is regulated by the Redevelopment Plan, which provides an outline for redevelopment to encourage the remediation of contaminated sites and return defunct and underutilized properties to active use, allowing them to contribute to the local economy. Prior to issuance of the Redevelopment Plan, the Koppers Koke Site was designated as a Meadowlands District Intermodal B zone, which is designed to accommodate high-intensity transportation facilities that are located proximate to rail lines in the Meadowlands District and whose operations are related to port and rail activities, including rail and trucking facilities and supporting uses. The Redevelopment Plan applies a zoning overlay onto certain properties within Blocks 286 and 287 in Kearny, including the Koppers Koke Site. The Redevelopment Plan proposes to provide for a variety of uses to support industrial usage of the properties while also providing opportunities for services to support industry within the Redevelopment Area. The recommended land uses for the planned development of the area can be classified into five planning categories; industrial/storage/truck uses, transport support services, neighborhood services, public/quasi-public uses (e.g., light public utilities), and water-dependent uses. The plan acknowledges that the historic contamination issues render the area unsuitable for residential development. The plan provides a comprehensive list of specific allowable uses, ranging from essential public services to heavy industry to "area-specific power generation facilities," defined as a facility producing power for the sole purpose of serving single or multiple properties within the redevelopment area boundary. In addition to permissible uses, the plan specifies bulk requirements, design criteria, and other redevelopment standards that supersede existing regulations. The Redevelopment Plan indicates that "unless superseded herein, all uses shall comply with the Category C environmental performance standards in N.J.A.C.§ 19:4-7.1 (2013)." (NJMC 2013).

Other public policy and adopted plans that guide development in the study area include:

- ***2004 NJMC Master Plan***. The latest Master Plan for the Meadowlands District includes land use plans for the entire district to guide future redevelopment and foster a healthy Meadowlands economy through the implementation of strategies that promote redevelopment and infill development, while minimizing the development of greenfields. Redevelopment of underutilized brownfield sites is one of the goals and the Redevelopment Area is identified as one of 20 planning areas, designated as Logistics Intermodal/Industrial. Traditionally associated with heavy industry, the Logistic Intermodal/ Industrial planning area provide the opportunity for meeting the demands of the logistics and intermodal industries. The intermodal designation is derived from the use of multiple transportation modes to move goods from manufacturing facilities to the consumer market. District zoning regulations and the Hackensack District Meadowlands Zoning

Map serve as the implementation tool for the land use planning objectives of the Master Plan. (NJMC 2004; (N.J.A.C. § 19:4 [2013]))

- ***The State Strategic Plan: New Jersey's State Development and Redevelopment Plan*** (and pending revisions), designates the Meadowlands District as a "Priority Growth Investment Area" – an area where more significant development and redevelopment is preferred and will be prioritized. The Redevelopment Plan cross-references the State plan and explains how it helps advance several of the State plan's goals, including targeted economic growth and effective regional planning. (New Jersey State Planning Commission [NJSPC] 2012)

- In 2008, the Town of Kearny adopted a ***Master Plan Reexamination Report / Master Plan Revision***. Several planning goals and objectives in this plan are promoted by and cross-referenced in the Redevelopment Plan, including the utilization of the redevelopment process as a tool for Kearny's revitalization, investments in the regional transportation network, and reclamation of contaminated sites. (Town of Kearny 2008)

- The Town of Kearny has been a New Jersey Urban Enterprise Zone (UEZ) Program municipality since November 1992. The UEZ program is intended "to foster an economic climate that revitalizes designated urban communities and stimulates their growth by encouraging businesses to develop and create private section jobs through public and private investment" (New Jersey Department of Community Affairs). Two properties in the redevelopment area, the Jana Company and Owens Corning sites, are currently included within the Town of Kearny's UEZ program. The Redevelopment Plan recommends the exploration of expanding the UEZ program to include all properties in the redevelopment area. (NJMC 2013)

- In 2006, the City of Jersey City adopted its ***Hoboken Avenue Redevelopment Plan*** (amended through 2015). The plan is intended to take a pro-active approach to addressing vacant land in generally poor condition and redevelop such lands to be more consistent with recently revitalized areas in the surrounding communities. (Jersey City 2015)

3.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

3.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed. With or without the proposed Project, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the adjacent six-acre parcel (Preferred Alternative Project Component B). As explained in Chapter 2, this acquisition is moving forward as part of a property settlement agreement between NJ TRANSIT and HCIA. Therefore, in the absence of the proposed Project, it is likely these portions of the Koppers Koke Site would be used for ancillary railroad purposes (storage, parking, etc.). Separately, Amtrak has plans to construct the new Kearny Substation, replacing the functions of the existing Substation No. 41 with or without the proposed Project; therefore, some changes to the land use within Cedar Creek Marsh South will occur, specifically to mapped surface water. This change however is consistent with current uses, and is located in an area that is not accessible for public recreation.

3.4.2 Build Alternative

Preferred Alternative Project Components A and B would occupy 20 acres and six acres, respectively, within the Redevelopment Area and result in a change in land use from vacant/brownfield to transportation, a positive impact. The utility improvements required to support the Main Facility would occur within NJ TRANSIT utility easements or within the 20-acre parcel and would not require any additional land use changes. The electrical lines for Project Components C, D, E and G would be located within railroad rights-of-way and would not require connection to public utilities. The preferred alternative for installation of electrical lines on a combination of monopoles, underground duct banks, and attachment to existing NJ TRANSIT infrastructure (i.e., HBLR elevated tracks and bridges) is consistent with current land use and zoning. Both the Preferred Alternative Project Component D through the rail yard and the optional routing along the Morris & Essex right-of-way would have the same impacts to land use and zoning. Preferred Alternative Project Component F is construction of an elevated platform for two emergency standby generators (i.e., the nanogrid) on NJ TRANSIT-owned property at the HBLR Headquarters facility. The proposed Project would be located primarily within NJ TRANSIT's existing right-of-way and entirely within transportation rights-of-way, and would not adversely affect land use, land use trends, future development, zoning, or public policy. Construction of the Build Alternative would further the goals of the Redevelopment Plan by returning a defunct and underutilized brownfield property to active use.

Use of the site for the Main Facility does not strictly adhere to the Redevelopment Plan's list of permitted uses, which includes: area-specific power generation facility, essential public services, heavy industry, rail terminals and yard, electric transmission tower, among other uses. An "area-specific power generation facility" is defined to be "a facility producing power for the sole purpose of serving single or multiple properties within the redevelopment area boundary" (NJMC 2013). The energy generated by the Main Facility would power railroad substations that are located beyond the boundaries of the Redevelopment Area. Nonetheless, the microgrid is consistent with the intent of the Redevelopment Plan, which includes supporting transportation services and restoring the property to active use. The Main Facility would be consistent with the intent of the underlying Intermodal B zoning designation, as it would support rail services. It is also consistent with the original Town of Kearny industrial zone designation. Additionally, implementing the proposed Project at the preferred location would not prevent the remainder of the Redevelopment Area from being developed in accordance with the Redevelopment Plan's intent and requirements. Where feasible and practical, the final design of Preferred Alternative Project Components A and B would conform to the applicable bulk requirements, design criteria, setbacks, and other redevelopment standards outlined in the Redevelopment Plan. NJ TRANSIT would continue to coordinate with NJSEA throughout the permitting and design phases as required.

The entirety of Cedar Creek Marsh is 60.5 acres of wetlands and open water; Cedar Creek Marsh North comprises 31.5 acres north of the Northeast Corridor and Cedar Creek Marsh South encompasses approximately 29 acres to the south of the Northeast Corridor. The new Kearny Substation and monopoles would occupy approximately two acres of waters in Cedar Creek Marsh South. The adjacent Amtrak

Substation No. 41 would be decommissioned once the new Kearny Substation is operational. While this two-acre portion would change to a transportation land use, the remainder of Cedar Creek Marsh South would maintain its existing natural land use. Cedar Creek Marsh South is a designated Environmental Conservation Zone, which consists of transportation corridors, areas designated for open space and habitat protection and enhancement, including wetland restoration and/or mitigation and potential wildlife management areas. The project area is located within the New Jersey Meadowlands District – an area of approximately 19,730 acres (32 square miles) in Bergen and Hudson Counties, of which approximately 8,400 acres (13 square miles) are wetlands, waterways, and open space (NJMC 2007). While the two acres of Cedar Creek Marsh South required for the new Kearny Substation and monopoles would not be used for open space or habitat protection or enhancement, it would not comprise a substantial percentage of the Meadowlands and would not adversely impact the effective regulatory land use policies. Furthermore, N.J.A.C. § 19:4-5.10 (2013) modified the Environmental Conservation Zone policy to include several special exception uses—including communication transmission towers and electrical transmission towers. The modification acknowledged that electrical transmission towers often require significant open spaces without obstructions from nearby buildings, and that the addition of electrical towers is consistent with the provision of the comprehensive regional plan not to exclude uses of a regional benefit. Overall, the proposed Project would not result in significant adverse impacts to the land use policies of the Meadowlands District, the NJDEP, or land use modifications governed by the USACE.

Where monopoles are installed for the electrical lines, they would be in areas where electrical lines, utility lines, and catenary systems are prevalent, and they would be in context with the existing infrastructure. The new monopoles will be designed to be consistent in color and texture to the existing monopoles, to further blend into the existing conditions of the corridor. The electrical line routes (Preferred Alternative Project Components E and G) would optimize the use of existing railroad right-of-way and easements and optimize the use of a NJ TRANSIT-owned tunnel and other transportation rights-of-way. Where electrical lines are installed in underground duct banks, there would be no effect on land use or zoning. Where the nanogrid (Preferred Alternative Project Component F) is proposed for connectivity to the southern portions of HBLR, it would be built entirely within NJ TRANSIT-owned property, already developed for transportation purposes.

As further discussed in Chapter 16, “Safety and Security,” the installation of monopoles within or near developed residential, commercial or mixed-use areas will not adversely affect public health from electromagnetic fields (EMFs). Electric fields from power lines, measured by voltage or the force behind the flow of electricity, rapidly become weaker with distance from its source and can be greatly reduced by trees, vehicles, walls and roofs of buildings. Underground power line electric fields are significantly reduced compared to its above ground counterparts. A more detailed analysis of EMFs for the Build Alternative is included in Chapter 16, “Safety and Security.” As the project corridor is currently a utility transmission corridor, the distance from power lines to occupied buildings and publicly accessible open areas will be within the guidelines and consistent with existing conditions.

Project Components A, B, C, D and E (portion within Kearny) will not affect the existing land use of adjacent properties, as the area is primarily heavy industry and transportation. The installation of electrical lines (both monopoles and underground duct banks) for Project Component 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. This existing infrastructure includes poles and towers at heights exceeding the maximum proposed monopole height (220 feet) for the proposed Project in industrial Kearny.

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 monopoles would be designed to be consistent with existing infrastructure. Where the electrical line is installed within underground duct banks, there would be no impact to adjacent land use since they would be installed within transportation rights-of-way and would not be visible, once the Build Alternative is operational.

Preferred Alternative Project Component F is proposed within the existing HBLR Headquarters property. Views of the nanogrid would be obstructed from nearby residential properties due to the existing HBLR Headquarters building. Therefore, there would be no impact to adjacent land use or zoning with construction of Preferred Alternative Project Component F.

Preferred Alternative Project Component G would be located entirely within NJ TRANSIT's existing right-of-way and travels through highly developed areas, as described above in Section 3.3.1. Where electrical lines are installed on monopoles (up to 39 feet tall) the monopoles would be designed to reflect the existing character of the particular areas (i.e., the new monopoles would be consistent in color and texture to existing monopoles in particular areas) to avoid aesthetic impacts. Where electrical lines are installed in underground duct banks or attached to the elevated HBLR tracks, the lines would not be visible. Therefore, the adjacent land uses will not change with the installation of the electrical lines on a combination of monopoles and underground duct banks for Preferred Alternative Project Component G.

Table 3-1 presents a summary of the changes in land use and zoning for each project component associated with the Build Alternative. As demonstrated in the table and in the analysis presented above, no significant impacts to land use, zoning, and public policy would result from implementation of the Build Alternative.

Table 3-1 Summary of Build Alternative's Effects on Land Use and Zoning

Project Element	Current Land Use	Current Zoning	Proposed Land Use	Proposed Zoning	Effects
Preferred Alternative Project Component A: Main Facility Site	Vacant Brownfields	Meadowlands District - Intermodal B Zone and Redevelopment Area	Transportation	Meadowlands District - Roads, Railroad Right-of-Way	Land Use: Positive Zoning: Neutral

Project Element	Current Land Use	Current Zoning	Proposed Land Use	Proposed Zoning	Effects
Preferred Alternative Project Component B: Natural Gas Pipeline Connection	Vacant Brownfields	Meadowlands District - Intermodal B Zone and Redevelopment Area	Transportation	Meadowlands District - Roads, Railroad Right-of-Way	Land Use: Positive Zoning: Neutral
Project Components C, D (all potential route options) and E: Proposed Electrical Line Routes (New Monopoles and Duct Banks)	Transportation	Meadowlands District - Intermodal B Zone, Environmental Conservation Area and Redevelopment Area, Heavy Industrial Jersey City – Highway Commercial, Transportation Right-of-Way, Residential, Redevelopment Area	Railroad Right-of-Way	Railroad Right-of-Way, Transportation	Land Use: Neutral Zoning: Neutral
Preferred Alternative Project Component D: New Kearny Substation and Towers in Cedar Creek Marsh South	Surface Water	Meadowlands District - Environmental Conservation Area	Transportation	Meadowlands District - Roads, Railroad Right-of-Way	Land Use: Adverse Zoning: Adverse
Preferred Alternative Project Component E: New NJ TRANSITGRID East Hoboken Substation	Mixed/Other Urban or Built-up Land	Jersey City - Redevelopment Area	Transportation	Transportation	Land Use: Neutral Zoning: Neutral

Project Element	Current Land Use	Current Zoning	Proposed Land Use	Proposed Zoning	Effects
Preferred Alternative Project Component F: Nanogrid at HBLR Headquarters	Commercial Services, Transportation	Jersey City - Redevelopment Area, Residential, Open/Space, Commercial	No change. Improvements on NJ TRANSIT owned property.	No change. Improvements on NJ TRANSIT owned property.	Land Use: Neutral Zoning: Neutral
Preferred Alternative Project Component G: Utility Work within existing HBLR Right-of-Way	Transportation	Residential, Industrial, Overlay District, Developed Area, Redevelopment Area, Commercial	No change. Electrical line within existing HBLR right-of-way	No change. Electrical line within existing HBLR right-of-way	Land Use: Neutral Zoning: Neutral

As shown in this table, 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. However, the area is within a restricted water body and is adjacent to two railroads and an interstate. This area is not publicly accessible and is a low value for natural resources, making any potential effects minor and insignificant. Other effects are positive or neutral for land use and zoning designations of the proposed Project area. Please refer to Chapter 8, “Visual Resources” for visual impacts, mitigation requirements for impacts within Cedar Creek Marsh South are discussed in Chapter 12, “Natural Resources.”

3.5 PROPERTY ACQUISITION REQUIREMENTS

As discussed in Chapter 2, “Project Alternatives,” and above, NJ TRANSIT’s acquisition of the two parcels within the Redevelopment Area would proceed as part of the No Action Alternative and is not an element of the proposed Project. Two new permanent easements would be utilized for the proposed Project. No active businesses or residences would be displaced. Preferred Alternative Project Components A and B would utilize the fee acquisition of 26 acres within the Koppers Koke Site—approximately 20 acres for Preferred Alternative Project Component A and six acres for the connection to the natural gas pipeline and the associated metering station (Preferred Alternative Project Component B).

Project Components C and D (all route options) would be entirely within NJ TRANSIT’s right-of-way, except for the monopole in Cedar Creek Marsh South and the acreage needed for the new Kearny Substation, which would be located on Amtrak property. The monopole would be installed on an existing railroad easement through a privately-owned portion of Cedar Creek Marsh South (owned by 42 Monmouth Street, LLC). Preferred Alternative Project Component E would be located entirely within NJ TRANSIT right-of-way. Preferred Alternative Project Component F would be within NJ TRANSIT-owned property (HBLR Headquarters). A description of the fee acquisitions and the permanent easements required for construction of the Build Alternative are presented in Table 3-2. The permanent easements include the land needed to construct the proposed Project and for ongoing maintenance requirements. A temporary floating access easement would be secured for construction access.

In the event that it becomes necessary for NJ TRANSIT to acquire additional properties, all acquisitions will be performed in accordance with the requirements of the Uniform Relocation Act. All FTA real property requirements, including FTA's early acquisition guidance, will be maintained if early acquisition of real property is required prior to the completion of NEPA. Identification of additional property acquisitions, although not currently anticipated, will be identified prior to final design of the project.

Table 3-2 Property Acquisition and Easements from the Build Alternative

Description/Need for Property	Block/Lot	Current Owner	Acquisition Type	Estimated Acreage
Preferred Alternative Project Component A: Main Facility Site [Note: this property is being acquired as part of No Action Alternative]	Portions of Block 287, Lots 60, 61.02, 61.03, 62, 63, 70	HCIA	Fee acquisition	19.38. HCIA and NJ TRANSIT would maintain various non-exclusive agreements for site access, drainage/stormwater system, construction, maintenance and mooring easements within this parcel.
Preferred Alternative Project Component B: Natural Gas Pipeline Connection and Metering Station [Note: this property is being acquired as part of No Action Alternative]	Block 287 Lot 73	HCIA	Fee Acquisition	6.05. HCIA would retain a non-exclusive Fish House Road access easement totaling 0.52 acres.
Preferred Alternative Project Component D: New Kearny Substation and Monopoles in Cedar Creek Marsh South	Block 284 Lot, 28.01, 28.03,	Amtrak (Lot 28.03) 42 Monmouth Street, LLC (Lot 28.01)	Permanent Easement	Minimum of 30-foot radius for construction and maintenance of electrical towers (Lot 28.01) and approximately 1.7 acres for new Kearny Substation (Lot 28.03).
Access/construction access	Portion of Block 287, Lot 70	HCIA	Temporary Floating Access Easement	Minimum of 30-foot width, total of 1.2 acres

3.6 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The Build Alternative would not result in significant adverse impacts to land use in the study area and would be consistent with zoning and public policy. While no mitigation is required for land use or zoning, 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. As discussed in Chapter 2, "Project Alternatives," under the No Action Alternative, the new Kearny Substation would still be constructed. Other effects from the proposed Project are positive (returning vacant Brownfield to active use) or neutral for land use and zoning designations.

Chapter 4 Community Facilities

4.1 INTRODUCTION

This chapter provides an inventory of community facilities, parkland, and open space within the study area and evaluates the potential for the No Action and Build Alternative to affect such resources and the services they provide. The analysis considers the same study areas as identified in Chapter 3, “Land Use, Zoning, and Public Policy.” Community facilities include publicly-accessible or publicly-funded facilities or services such as police and fire stations, schools, hospitals, nursing homes, day care centers, and libraries. Parkland and publicly-accessible open spaces are also addressed in this chapter. Parkland means land acquired, developed, and/or used for recreation and conservation purposes, and includes funded and unfunded parkland (NJDEP 2011). Open space is defined as publicly or privately-owned land that is publicly accessible and available for leisure, play, or sport, or is set aside for the protection and/or enhancement of the natural environment. Open space can be described as active or passive—active open space is used for sports, exercise, or active play and passive open space is used for relaxation, such as sitting or strolling.

The inventory was created to support the land use analysis prepared in accordance with the *Guideline on Air Quality Impact Modeling Analysis* (NJDEP 2009). The inventory identified centers where the elderly, young or the infirmed congregate. This chapter also evaluates the applicability of additional laws and permits that pertain to parkland—including the New Jersey Green Acres Program, which includes properties subject to Section 6(f) of the Land and Water Conservation Fund Act (16 U.S.C. § 460 [2005]).

Since the Build Alternative would not include residential construction or new transit service that would induce additional development, it would not place additional demand on community services such as schools, parks, or hospitals. A description of the extent to which the Build Alternative would influence the local police and fire departments and emergency medical service response to an event at the facilities within the study area is addressed below.

4.2 AFFECTED ENVIRONMENT

Community facilities as well as parklands, open spaces and cemeteries in the study areas for Project Components A through G are listed in Table 4-1 and are identified by Map ID # on Figures 4-1 and 4-2.

4.2.1 Project Area Plus 500-Foot Buffer

Due to the heavy industrial nature of the area, no community facilities or parks are located within the 500-foot buffer in Kearny (Project Components A through D). In Weehawken, Jersey City, Hoboken, Union City, North Bergen, West New York and Bayonne. There are seventeen educational facilities (public and private), four fire departments, three healthcare facilities, three cemeteries and twenty-eight parks within 500 feet of Preferred Alternative Project Components E and G. Six of the educational facilities (Map ID #s 24, 39, 77, 78, 79. 82) are located within the 500-foot buffer where electrical lines will either travel through a tunnel or within the bypassed track section of Preferred Alternative Project Component G. One

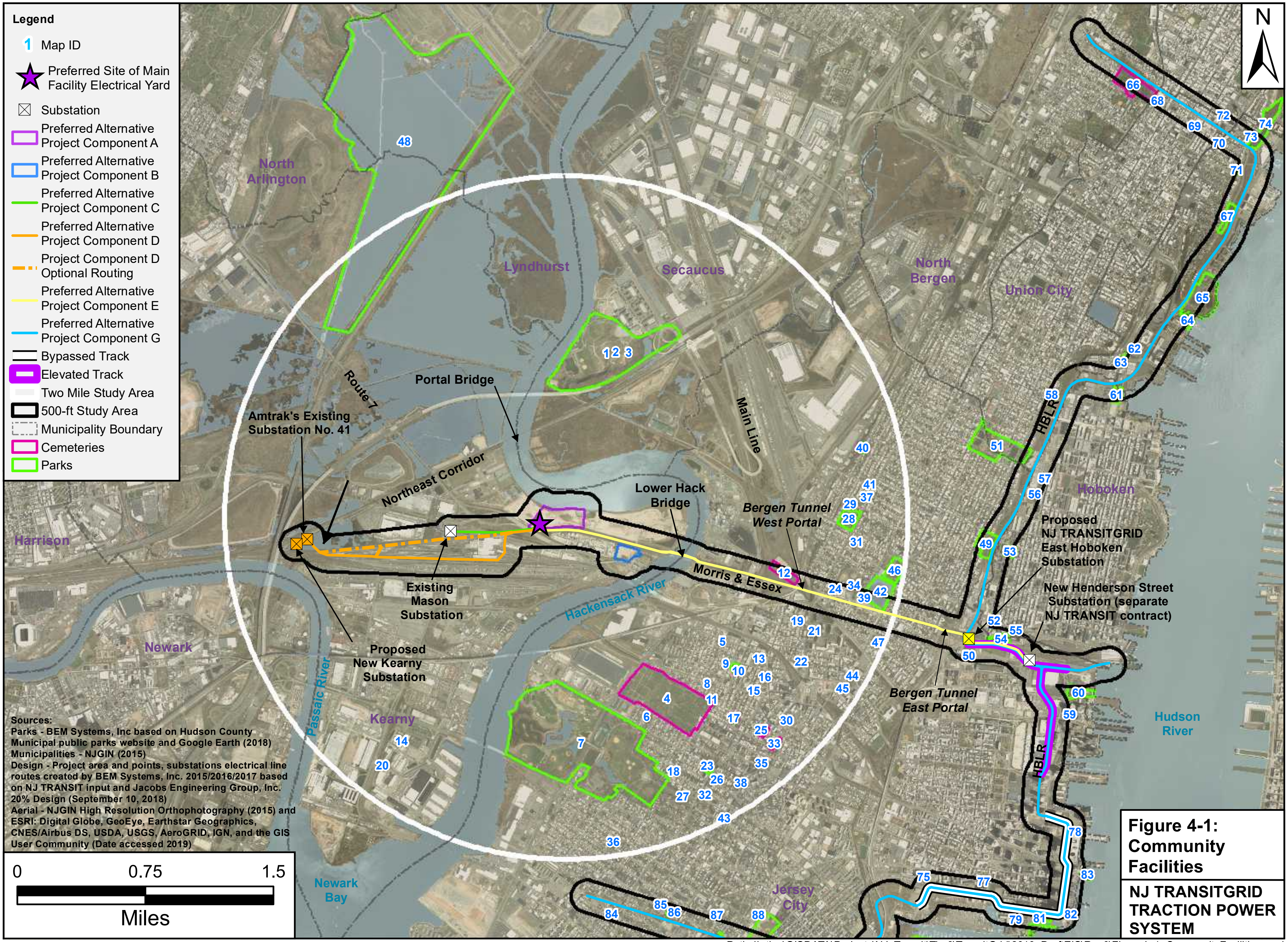

Figure 4-1: Community Facilities

NJ TRANSITGRID TRACTION POWER SYSTEM

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Figure 4-2: Community Facilities

NJ TRANSITGRID TRACTION POWER SYSTEM

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<u>Educational and Day Care Facilities</u>

There are 11 educational and day care facilities located within the 500-foot buffer of Preferred Alternative Project Component G where the electrical line would be installed through a combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks). These educational and day care facilities are summarized below and are listed in Table 4-1.

The Viaquenti Academy (Map ID #50) - The Viaquenti Academy is a private school serving children from the age of three months (in the form of day care, early pre-school, pre-school, and pre-kindergarten) through second grade. It is located at 837 Jersey Avenue in Jersey City. It has a licensed capacity of 105 children.

The Learning Experience (Map ID #56) – The Learning Experience is a private school serving children from the age of six weeks through eight years, located at 900 Monroe Street in Hoboken. It has a licensed capacity of 161 children.

The Smart Start Academy (Map ID #57) – The Smart Start Academy is a private school serving children from the age of six months through nine years (in the form of infant programs through pre-kindergarten, day care, and after school programs for children until the age of 9), located at 552 9th street in Hoboken. It has a licensed capacity of 73 children.

The River School Newport (Map ID #59) – The River School Newport is a private school serving children from the age of eight weeks through six years (corresponding to day care through pre-kindergarten), located at 30 Newport Parkway in Jersey City. There are currently approximately 160 students enrolled for the 2018-2019 school year. It has a licensed capacity of 175 children.

The Liberty Science Center (Map ID #76) – The Liberty Science Center is a 300,000 square foot interactive science museum and learning center that accepts guests of all ages, located at 222 Jersey City Boulevard in Jersey City. More than 750,000 students, teachers, and parents visit the Liberty Science Center each year.

Advanced Services International DayCare Center (Map ID #84) – Advanced Services International DayCare Center is an adult day care that accepts senior citizens and disabled adults over 18 years of age, located at 49-51 Morton Place in Jersey City.

The Learning Tree (Map ID #86) – The Learning Tree is a private school designed for young children. It offers child care/ day care, pre-school, and pre-kindergarten services, and is located at 411-413 Martin Luther King Drive in Jersey City. It has a licensed capacity of 30 children.

Lincoln Community School #5 (Map ID #95) – Lincoln Community School #5 is a public-school serving pre-kindergarten through eighth grades, located at 208 Prospect Avenue in Bayonne. Enrollment is 481 students in the 2018-2019 school year.

Nicholas Oresko Community School #14 (Map ID #97) - Nicholas Oresko Community School #14 is a public-school serving pre-kindergarten through eighth grades, located at 33 East 24th Street in Bayonne. Enrollment is 466 students in the 2018-2019 school year.

Beacon Christian Academy (Map ID #99) – The Beacon Christian Academy is a private school serving pre-school through eighth grades and includes over 80% children of color. It is located at 21 West 8th Street in Bayonne and has 184 students enrolled for the 2018-2019 school year.

Bayonne Head Start Program (Map ID #102) – Bayonne Head Start Program is a public program for low-income and special needs children from the age of three to five years to succeed in future schooling. It has a licensed capacity of 89 children.

<u>Law Enforcement and Fire Departments</u>

There are four fire departments and no law enforcement facilities located within the 500-foot buffer of Preferred Alternative Project Components E and G where the electrical line would be installed through a combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks). These facilities are summarized below and are listed in Table 4-1.

Hoboken Fire Department (Map ID #55) – The Hoboken Fire Department (Engine Company 1/Ladder Company 2) is located at 43 Madison Street in Hoboken near Hoboken Yard and within the 500-foot buffer of Preferred Alternative Project Component E.

North Hudson Regional Fire and Rescue 3 (Map ID #63) – The North Hudson Regional Fire and Rescue 3 is located at 1900 Willow Avenue in Weehawken within the 500-foot buffer of Preferred Alternative Project Component G.

North Hudson Regional Fire and Rescue Ladder 3 (Map ID #70) – The *North Hudson Regional Fire and Rescue Ladder 3* is located at 4610 Park Avenue in Weehawken within the 500-foot buffer of Preferred Alternative Project Component G.

North Hudson Regional Fire and Rescue Squad 1/Battalion 2 (Map ID #72) – The North Hudson Regional Fire and Rescue Squad 1/Battalion 2 is located at 4911 Broadway in West New York and is within the 500-foot buffer of Preferred Alternative Project Component G.

Health Care and Emergency Services

There are two health care facilities located within the 500-foot buffer of Preferred Alternative Project Component G where the electrical line would be installed through a combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks). These facilities are summarized below and are listed in Table 4-1.

Metropolitan Family Care Hospital (Map ID #89) – Metropolitan Family Care hospital is located at 935 Garfield Avenue in Jersey City within the 500-foot buffer of Preferred Alternative Project Component G where the electrical line would be installed through a combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks).

Bayonne Medical Center (Map ID #94) – Bayonne Medical Center is located at 29 East 29th Street in Bayonne within the 500-foot buffer of Preferred Alternative Project Component G where the electrical line would be installed through a combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks).

Cemeteries

There are two cemeteries located within the 500-foot buffer of Preferred Alternative Project Component G where the electrical line would be installed through a combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks). These educational and day care facilities are summarized below and are listed in Table 4-1.

Saint Peters Cemetery (Map ID #12) – The Saint Peters Cemetery was established in 1849 at 309 Tonnelle Avenue in Jersey City. The cemetery is approximately 4.29 acres in size and is no longer active. As this is also a Historic Resource, it is further discussed in Chapter 9, “Historic Resources.”

Bay View New York Bay Cemetery (Map ID #91) – Bay View New York Bay Cemetery is located at 321 Garfield Avenue in Jersey City and was established in 1848. It extends to the sloped terrain from Garfield Avenue to the bottom of a hill that oversees New York City. The cemetery is still operational.

Parkland and Open Space

There are currently no publicly-accessible parks or open space near Preferred Alternative Project Components A, B, C, or D. As noted in Chapter 3, “Land Use, Zoning, and Public Policy,” two planned residential developments near Project Component E will include publicly-accessible open space:

- The former Van Leer Chocolate Factory residential condominium complex will include a 1.5-acre public park. This development is currently under construction.

- Along Coles Street, about 5.5 acres of land will be redeveloped into a large mixed-use development with a two-acre public park. While this project has been approved by Jersey City, a construction start date is not currently available from the developer.

The twenty-eight parks that are located within the 500-foot study area of Preferred Alternative Project Components E, F, and G are summarized below and shown on Figures 4-1 and 4-2. Note that only the Liberty State Park (Map ID #80) is located within the 500-foot study area of both Preferred Alternative Project Components F and G while Southwest (Map ID #52), and Gateway (Map ID #54) Parks are the only parks within the 500-foot study area of both Preferred Alternative Components E and G. All other parks discussed below are partially or completely located within the 500-foot buffer of Preferred Alternative Project Component G where the electrical line would be installed through combination of monopoles (maximum of 39 feet tall), underground duct banks, or attached to existing infrastructure (i.e., HBLR elevated tracks).

Riverview-Fisk Park, Jersey City (Map ID #49) – Riverview-Fisk Park, encompassing 8.55 acres, is owned by the City of Jersey City and is located on Ogden Avenue. It consists of multiple basketball courts and a playground. It also has a view of the Hudson River waterfront and New York City skyline.

Washington Park, Jersey City and Union City (Map ID #51) – Washington Park, encompassing 26.55 acres, is owned by Hudson County and is located along Central and New York Avenues within Jersey City and Union City. It consists of four baseball fields, nine tennis courts, a basketball court, and a playground.

Southwest Resiliency Park, Hoboken (Map ID #52)– Southwest Resiliency Park encompassing 0.69 acres, is owned by the City of Hoboken, and is located at 58 Jackson Street. It consists of a dog run, outdoor amphitheater, flower gardens, sitting areas with tables and benches.

Mama Johnson Field, Hoboken (Map ID #53) – Mama Johnson Field, encompassing 1.70 acres, is owned by the City of Hoboken and is located at 400 Jackson Street. It consists of a multi-use athletic field.

Gateway Park, Hoboken (Map ID #54) – Gateway Park, encompassing 2.74 acres, is owned by the City of Hoboken and is located on the corner of Newark and Jackson Streets. It consists of a grassy area with landscaped shrubbery.

Firefighters Memorial Park, Union City (Map ID #58) – Firefighters Memorial Park, encompassing 0.66 acres, is owned by the City of Union City and is located at 9th Street and Palisades Avenue. It consists of an Olympic sized pool with handicapped access, a children’s wading facility, and a sprinkler playground. The park is dedicated to North Hudson Regional Fire and Rescue.

Newport Green Park, Jersey City (Map ID #60) – Newport Green Park, encompassing 5.08 acres, is owned by the City of Jersey City and is located at the intersection of Washington Boulevard and 14th Street. It consists of a sandy beach, playground area, and landscaped grass area. The park is located along the Hudson River waterfront walkway with views of the River as well as New York City.

Sixteen Hundred Park, Hoboken (Map ID #61) – Sixteen Hundred Park, encompassing 2.80 acres, is owned by the City of Hoboken and is located at 1600 Park Avenue. It consists of a multi-use field and a dog run.

19th Street Basketball Courts, Weehawken (Map ID #62) – 19th Street Basketball Courts, encompassing 0.24 acres, is owned by the Township of Weehawken and is located at the intersection of 19th Street and Park Avenue. It consists of basketball and handball courts.

Weehawken Pier and Lincoln Harbor Park, Weehawken (Map ID #64) – The pier stretches 450 feet into the Hudson River and includes five piers connected by aluminum bridges, with seating and lighting. The pier is collocated to Lincoln Harbor Park, which includes space for relaxation and sight-seeing. Both are at the intersection of Harbor and Port Imperial Boulevards.

Weehawken Waterfront Park and Recreation Center, Weehawken (Map ID #65) – The Waterfront Park and Recreation Center, encompassing 22.34 acres, is owned by the Township of Weehawken and is located along the Hudson River at Port Imperial Boulevard. It consists of two small playgrounds and the Hudson River Walk. The recreation facilities include turf soccer fields, two softball fields, a track, three tennis courts, and a workout area.

Hamilton Park, Weehawken (Map ID #67) – Hamilton Park, encompassing 3.86 acres, is owned by the Township of Weehawken and is located at 773 Boulevard East at Hudson Place. It consists of a landscaped lawn area with benches and a view of the New York City skyline. It also consists of several monuments and a Soldiers and Sailors Memorial.

Louisa Park, Weehawken (Map ID #71) – Louisa Park, encompassing 0.40 acres, is owned by the Township of Weehawken and is located at 915 JFK Boulevard East. It consists of a playground, two basketball courts, benches, and picnic tables and has views of the New York City skyline.

Township of Weehawken Veterans Park, Weehawken (Map ID #73) – Township of Weehawken Veterans Park, encompassing 0.16 acres, is owned by the Township of Weehawken and is located at 10 49th Street. It consists of a fenced-in grass area with benches and a view of the New York City skyline.

Old Glory Park, Weehawken (Map ID #74) – Old Glory Park, encompassing 10.32 acres, is owned by the Township of Weehawken and is located on John F. Kennedy Boulevard. It consists of a small landscaped area with benches and a view of New York City and the Hudson River.

Berry Lane Park, Jersey City (Map ID #88) – Berry Lane Park, encompassing 12.76 acres, is owned by the City of Jersey City and is located along Garfield Avenue. It consists of a baseball diamond, basketball courts, multi-purpose athletic fields, tennis courts, skate park, spray park, playground, and dog run. It also has a fitness court, walking path, and rain garden. The area was originally designated as a brownfield but was remediated through funding obtained by federal, state, county and local agencies and developed into parkland.

Virginia Avenue Park, Jersey City (Map ID #85) – Virginia Avenue Park, encompassing 0.28 acres, is owned by the City of Jersey City and is located at 74-80 Virginia Avenue. It consists of a gated playground as well as basketball courts.

Arthur Ashe Basketball Court, Jersey City (Map ID # 86) – Arthur Ashe basketball court, encompassing 0.13 acres, is owned by the City of Jersey City and is located at 285 Arlington Avenue. It consists of a fenced-in basketball court.

Bayside Park, Jersey City (Map ID #90) – Bayside Park, encompassing 9.27 acres, is owned by the City of Jersey City and is located at 99 Bayside Park Avenue. It consists of a baseball court, basketball court, playgrounds, and tennis courts. It also has a landscaped lawn and walking paths.

Russell Golding Park, Bayonne (Map ID #92) – Russell Golding Park, encompassing 0.41 acres, is owned by the City of Bayonne and is located along Avenue E. It consists of a spray park, basketball court, seating area, playground, and walking paths.

Sigmund "Ziggy" Mackiewicz Park, Bayonne (Map ID #93) – Sigmund "Ziggy" Mackiewicz Park, encompassing 0.15 acres, is owned by the City of Bayonne and is located at the corner of 40th Street and Avenue E. The park is dedicated to a Korean war veteran and Bayonne Fire Department Captain. The park consists of a fenced-in playground.

28th Street Playground, Bayonne – (Map ID #96) 28th Street Playground, encompassing 0.98 acres, is owned by the City of Bayonne and is located at Avenue F and East 28th Street. It consists of a walking trail, benches, playground, and basketball courts.

Sister Miriam Teresa Park, Bayonne (Map ID #98) – Sister Miriam Teresa Park, encompassing 0.87 acres, is owned by the City of Bayonne and is located at 2 Gregg Lane. It consists of a walking path, benches, and flowering gardens.

11th Street Oval Park, Bayonne (Map ID #100) – 11th Street Oval Park, encompassing 0.68 acres, is owned by the City of Bayonne and is located at the intersection of Avenue E and East 10th Street. It consists of a walking trail, benches, baseball field, and a playground.

Edward F. Clark Park, Bayonne (Map ID #101) – Mayor Edward Clark Park, encompassing 0.58 acres, is owned by the City of Bayonne and is located at the intersection of Avenue C and West 8th Street. It consists of a walking trail, benches, basketball court, wading pool, and playground.

4.2.2 Two-Mile Study Area (Project Component A)

Similar to Chapter 3, "Land Use, Zoning, and Public Policy", a two-mile radius around the Main Facility (Preferred Alternative Project Component A) was delineated. Community facilities in this two-mile study area are discussed below.

<u>Educational and Day Care Facilities</u>

There are twenty-four educational facilities located within the two-mile study area, which are in Jersey City and Secaucus. The nearest school (The Ethical Community Charter School in Jersey City [Map ID #5]) is approximately 1.3 miles away from the Main Facility site. The educational facilities are listed in Table 4-1 below.

Law Enforcement and Fire Departments

There are five fire departments located in the two-mile study area. The closest fire department is Kearny Fire Department Station 4 (Map ID #20), located at 2 John Miller Way in the southern portion of the Kearny peninsula. The Jersey City Fire Department operates and maintains a hazardous materials response unit out of their locations.

There are four law enforcements facilities located within the two-mile study area (i.e., Map ID #14, 22, 44, and 45). The Hudson County Correctional Center (Map ID #14) is the closest law enforcement facility to Preferred Alternative Project Component A.

Healthcare and Emergency Services

There are no emergency service facilities located within the two-mile study.

Parkland and Publicly-Accessible Open Space

There are ten public parks within the two-mile study area:

Laurel Hill Park, Secaucus (Map ID #1) - Laurel Hill Park is owned by Hudson County and is considered a landmark in the North Jersey region because of its large igneous rock formations. Formerly a quarry, the remaining rock forms the southern edge of the park. This bedrock juts up approximately 111.83 feet at its highest point. The park offers ball fields, cricket and batting cages, playgrounds and picnic areas on the Hackensack waterfront.

Lincoln Park and Lincoln Park West, Jersey City (Map ID #7) - Lincoln Park, dating back to 1905, is owned by Hudson County and is situated on 252.52 acres with many historic points of interest, memorials and monuments. The park hosts a variety of athletic facilities, including 21 tennis courts, 7 baseball/softball diamonds, basketball courts, handball courts, soccer fields, an artificial surface multipurpose field, a running track, a cross-country course, and a horseshoe pit. There are also two playgrounds and a spray pool area for children. Visitors can take advantage of full-length trails, barbeque areas, and an enclosed dog run. The county recently added a 9-hole public golf course in Lincoln Park West and there are also fishing facilities.

*Michael Martucci Sr. Memorial Little League Park, Jersey City (*Map ID #10*)* – Michael Martucci Sr. Memorial Little League Park, encompassing 0.98 acres, is owned by the City of Jersey City and is located at 1020 Westside Avenue. It consists of a fenced-in little league park and soccer field.

LaPointe Park, Jersey City (Map ID #17) - LaPointe Park, encompassing 0.28 acres, is owned by Jersey City and located on Stuyvesant Avenue and Dekalb Avenue. The park is gated and locked when not in use. Facilities include a children’s playground, a spray bollard, a plaza with seating, a picnic area, and benches.

Boyd McGuiness Park, Jersey City (Map ID #23) - Boyd McGuiness Park, encompassing 0.64 acres, is owned by the City of Jersey City and located on Kennedy Boulevard and Duncan Avenue. It consists primarily of a memorial, with a diagonal path running through the pocket park.

Leonard Gordon Park, Jersey City (Map ID #28) - Leonard Gordon Park is owned by Jersey City and is situated on 5.99 acres on the western slope of the Palisades between Kennedy Boulevard and Liberty Avenue in Jersey City Heights. The park contains a gazebo, a fenced children's playground, two basketball courts, a tennis court, and passive open space. Park statuary includes the *Buffalo and Bears,* a World War I Memorial Doughboy, a bronze reclining lion, and a granite memorial from the Raymond Sipnick Post of the Jewish War Veterans.

Terrace Avenue Park (Edward Crincoli Park, RA Park), Jersey City (Map ID #40) – These two parks encompass approximately 0.83 acre, owned by the City of Jersey City on Thorne Street. Wooded and gently sloping, these parks feature a tennis court, playground, spray bollard, and passive open space.

Reservoir No. 3, Jersey City (Map ID #42) - Reservoir No. 3, encompassing 13.94 acres, is owned by Jersey City and located on Central, Summit and Jefferson Avenues. It is contiguous to Pershing Field. It was a water-holding facility until it was closed in the 1970s and is still entirely surrounded by imposing stone walls. The park is used for only passive recreation due to the existing natural habitats on the park site.

Pershing Field Park, Jersey City (Map ID #46) - Pershing Field, encompassing 7.04 acres, is owned by the City of Jersey City and located on Central Avenue. It is one of the largest Jersey City-owned parks and is opposite the Reservoir No. 3 site. Facilities include an adult baseball field, a youth/little league baseball field, two basketball courts, bocce/shuffleboard courts, a running track, spray bollards, an indoor swimming pool and swimming bathhouses, a children's playground, community center, an ice-skating rink, and four tennis courts.

Richard W. DeKorte Park, Lyndhurst (Map ID #48) - Richard W. DeKorte Park is owned by the NJSEA. The 625.27-acre park features a landscaped capped landfill and trails leading out into wildlife observation areas and bird blinds. The 640-acre park also includes the Meadowlands Environment Center, which contains informative exhibits on the Meadowlands and its ecology, and the William D. McDowell Observatory.

<u>Cemeteries</u>

Cemeteries found within the two-mile study area of Project Component A are described below.

Holy Name Cemetery & Mausoleum (Map ID #4) – The Holy Name Cemetery & Mausoleum was established in 1866 at 823 West Side Avenue in Jersey City. The cemetery is approximately 63 acres in size and is an active cemetery for Catholic families.

Speer Cemetery (Map ID #25) – The Speer Cemetery was established in 1866 and is located at 145 Vroom Street in the City of Jersey City. The earliest grave marker is dated 1756. The cemetery is slightly larger than one acre in size. The last interments occurred during World War I.

Old Bergen Cemetery (Map ID #33) – The Old Bergen Cemetery was established in 1668 at the southwest corner of Bergen and Vroom Street in Jersey City. The last burial took place in 1945.

Table 4-1 Community Facilities within 500 Feet of Proposed Electrical Line and/ or Two-Mile Study Area

MAP ID #	FACILITY	ADDRESS	CITY	STUDY AREA
	EDUCATIONAL AND DAY CARE FACILITIES			
2	High Tech High School	1 High Tech Way	Secaucus	2 Mile
3	Knowledge Advanced Skills	1 High Tech Way	Secaucus	2 Mile
5	The Ethical Community Charter School	95 Broadway	Jersey City	2 Mile
6	Dr. Charles P. DeFuccio No. 39 Elementary School	214 Plainfield Avenue	Jersey City	2 Mile
8	Liberty High School	299 Sip Avenue	Jersey City	2 Mile
11	Mosdos Of Greenville	925 West Side Avenue	Jersey City	2 Mile
13	Mahatma K. Gandhi School – PS 23	143 Romaine Avenue	Jersey City	2 Mile
16	Saint Elizabeth Child Care	129 Garrison Avenue	Jersey City	2 Mile
18	Saint Aloysius Elementary Academy	721 West Side Avenue	Jersey City	2 Mile
19	Anthony J. Infante No. 31 Elementary School	3055 Kennedy Boulevard	Jersey City	2 Mile
21	Jersey City Golden Door Charter School	3044 Kennedy Boulevard	Jersey City	2 Mile
24	Franklin L. Williams School – MS 7	222 Laidlaw Ave	Jersey City	2 Mile
26	Saint Dominic Academy	2572 John F. Kennedy Boulevard	Jersey City	2 Mile
27	Learning Community Charter School	2495 John F. Kennedy Boulevard	Jersey City	2 Mile
29	Oasis Child Care	260 Hutton Street	Jersey City	2 Mile
30	Martin Luther King, Jr. – PS 11	886 Bergen Avenue	Jersey City	2 Mile
31	Little Smiles Preschool	70 Beach Street	Jersey City	2 Mile
32	Primary Prep	41 Tuers Avenue	Jersey City	2 Mile
35	Hudson Catholic Regional High School	790 Bergen Avenue	Jersey City	2 Mile
36	Dr. Paul Rafalides School PS #33	362 Union Street	Jersey City	2 Mile
37	Nicolaus Copernicus School – PS 25	3385 Kennedy Boulevard	Jersey City	2 Mile
39	Patricia M. Noonan School, PS#26	164 Laidlaw Avenue	Jersey City	2 Mile
43	Joseph H. Brensinger School – PS 17	600 Bergen Avenue	Jersey City	2 Mile
47	Jotham W. Wakeman No. 6 Elementary School	100 St. Pauls Avenue	Jersey City	2 Mile
50	Viaquenti Academy	837 Jersey Avenue	Jersey City	500-Foot
56	The Learning Experience	900 Monroe Street	Hoboken	500-Foot
57	Smart Start Academy	552 9th Street	Hoboken	500-Foot
59	River School Newport	30 Newport Parkway	Jersey City	500-Foot
68	Hudson County Community College	4800 Kennedy Boulevard	Union City	500-Foot
69	Union City Day Care	219 47th Street	Union City	500-Foot
76	Liberty Science Center	222 Jersey City Boulevard	Jersey City	500-Foot
77	Early Learning Academy	201 Marin Boulevard Unit 1A	Jersey City	500-Foot
78	Bright Horizons at Plaza 3- Waterfront	152 Plaza 3	Jersey City	500-Foot
79	Waterfront Montessori	150 Warren Street, Suite 108	Jersey City	500-Foot
82	Learning Ladders	33 Hudson Street	Jersey City	500-Foot

MAP ID #	FACILITY	ADDRESS	CITY	STUDY AREA
84	Advanced Services International DayCare Center	49-51 Morton Place	Jersey City	500-Foot
86	Learning Tree	411-413 Martin Luther King Drive	Jersey City	500-Foot
95	Lincoln Community School #5	208 Prospect Avenue	Bayonne	500-Foot
97	Nicholas Oresko #14	33 East 24th Street	Bayonne	500-Foot
99	Beacon Christian Academy	30 Prospect Avenue	Bayonne	500-Foot
102	Bayonne Head Start Program	21 West 8th Street	Bayonne	500-Foot
	LIBRARIES			
9	Marion Library	1017 West Side Avenue	Jersey City	2 Mile
	LAW ENFORCEMENT & FIRE DEPARTMENTS			
14	Hudson County Correctional Center	30-35 Hackensack Avenue	Kearny	2 Mile
15	Jersey City Fire Department - Engine 15 Ladder 9	200 Sip Avenue	Jersey City	2 Mile
20	Kearny Fire Department Station 4	2 John Miller Way	Kearny	2 Mile
22	Jersey City Police Department	1 Journal Square Plaza – Division of Police - Floor 4	Jersey City	2 Mile
34	Jersey City Fire Department - Engine 7 Ladder 3	715 Summit Avenue	Jersey City	2 Mile
38	Jersey City Fire Department Engine 9	697 Bergen Avenue	Jersey City	2 Mile
41	Jersey City Fire Department - Engine 11	152 Lincoln Street	Jersey City	2 Mile
44	Hudson County Prosecutor's Office	595 Newark Avenue	Jersey City	2 Mile
45	Hudson County Sheriff's Office	595 Newark Avenue	Jersey City	2 Mile
55	Hoboken Fire Department Engine Company 1/ Ladder Company 2	43 Madison Street	Hoboken	500-Foot
63	North Hudson Regional Fire and Rescue	11 Port Imperial Boulevard	West New York	500-Foot
70	North Hudson Regional Fire and Rescue Ladder 3	1900 Willow Avenue in Weehawken	Weehawken	500-Foot
72	North Hudson Regional Fire and Rescue Squad 1	4911 Broadway	West New York	500-Foot
	HEALTHCARE AND EMERGENCY SERVICES			
75	Jersey City Medical Center	355 Grand Street	Jersey City	500-Foot
89	Metropolitan Family Health Network	935 Garfield Avenue	Jersey City	500-Foot
94	Bayonne Medical Center	29 East 29th Street	Bayonne	500-Foot
	PARKLAND AND PUBLICLY-ACCESSIBLE OPEN SPACE			
1	Laurel Hill Park	Laurel Hill Road	Secaucus	2 Mile
7	Lincoln Park	Duncan Avenue	Jersey City	2 Mile
10	Michael Martucci Sr. Memorial Little League	1020 Westside Avenue	Jersey City	2 Mile
17	LaPointe Park	Dekalb Avenue	Jersey City	2 Mile
23	Boyd McGuiness Park	Duncan Avenue	Jersey City	2 Mile
28	Leonard Gordon Park	John F. Kennedy Boulevard	Jersey City	2 Mile
40	Terrace Avenue Park (Edward Crincoli Park, RA Park)	Thorne Street	Jersey City	2 Mile
42	Reservoir No. 3	Reservoir Avenue	Jersey City	2 Mile
46	Pershing Field Park	201 Central Avenue	Jersey City	2 Mile

MAP ID #	FACILITY	ADDRESS	CITY	STUDY AREA
48	Richard W. DeKorte Park	1 DeKorte Park	Lyndhurst	2 Mile
49	Riverview-Fisk Park	Ogden Avenue	Hoboken	500-Foot
51	Washington Park	198 New York Avenue	Union City	500-Foot
52	Southwest Resiliency Park	58 Jackson Street	Hoboken	500-Foot
53	Mama Johnson Park	400 Jackson Street	Hoboken	500-Foot
54	Gateway Park	653 Newark Street	Hoboken	500-Foot
58	Firefighters Memorial Park	906 Palisade Avenue	Union City	500-Foot
60	Newport Green Park	Washington Boulevard & 14th Street	Jersey City	500-Foot
61	Sixteen Hundred Park	1600 Park Avenue	Hoboken	500-Foot
62	19th Street Basketball Courts	19th Street and Park Ave.	Weehawken	500-Foot
64	Weehawken Pier and Lincoln Harbor Park	Port Imperial Boulevard	Weehawken	500-Foot
65	Weehawken Waterfront Park and Recreation Center	1 Port Imperial Boulevard	Weehawken	500-Foot
67	Hamilton Park	773 Boulevard East	Weehawken	500-Foot
71	Louisa Park	915 JFK Boulevard East	Weehawken	500-Foot
73	Township of Weehawken Veterans Park	10 49th Street	Weehawken	500-Foot
74	Old Glory Park	John F. Kennedy Boulevard	Weehawken	500-Foot
80	Liberty State Park	200 Morris Pesin Drive	Jersey City	500-Foot
81	Korean War Veterans Park	Washington Street	Jersey City	500-Foot
83	J. Owen Grundy Park	Hudson Street	Jersey City	500-Foot
85	Virginia Avenue Park	74-80 Virginia Avenue	Jersey City	500-Foot
87	Arthur Ashe Basketball Court	285 Arlington Avenue	Jersey City	500-Foot
88	Berry Lane Park	1000 Garfield Avenue	Jersey City	500-Foot
90	Bayside Park	99 Bayside Park Drive	Jersey City	500-Foot
92	Russell Golding Park	Avenue E and East 49th Street	Bayonne	500-Foot
93	Sigmund Mackiewicz Park	40th Street	Bayonne	500-Foot
96	28th Street Park and Avenue F	28th Street	Bayonne	500-Foot
98	Sister Mariam Theresa Park	2 Gregg Lane	Bayonne	500-Foot
100	11th Street Oval Park	Avenue E and East 10th Street	Bayonne	500-Foot
101	Edward F. Clark Park	Avenue C and West 8th Street	Bayonne	500-Foot
	CEMETERIES			
4	Holy Name Cemetery & Mausoleum	823 West Side Avenue	Jersey City	2 Mile
25	Speer Cemetery	145 Vroom Street	Jersey City	2 Mile
33	Old Bergen Church Cemetery	806 Bergen Avenue	Jersey City	2 Mile
12	Saint Peters Cemetery	309 Tonnelle Avenue	Jersey City	500-Foot
66	Grove Church Cemetery	1132 46th Street	North Bergen	500-Foot
91	Bay View- New York Bay Cemetery	321 Garfield Avenue	Jersey City	500-Foot

4.3 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

4.3.1 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. There would be a missed opportunity to increase commuter safety and security in future widespread power outages. Under the No Action Alternative, other planned and programmed transportation improvements for which commitment and financing have been identified would be implemented 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 Site.

As stated above, there are two planned residential developments 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 (currently under construction) 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. These residential developments will be completed under the No Action Alternative.

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 Site 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). The No Action Alternative will not result in any changes or impacts to community facilities or services, parkland, or open space in the study areas.

4.3.2 Build Alternative

There are no community facilities, parklands, or publicly accessible open space resources within the construction footprint of the Build Alternative. As previously noted, the community facilities identified on Figure 4-1 and Table 4-1 (Map IDs 2, 3, 19, 21, 24, 34, 42, 66, 68, 69, 75, 77, 78, 82 and 83) are located where Preferred Alternative Project Component E travels through the Bergen Tunnels or where Preferred Alternative Project Component G travels through the Weehawken Tunnel or along the bypassed track for Preferred Alternative Project Component G. Although community facilities are located along these project components, these transportation and utility uses have co-existed with such facilities and therefore, no direct or indirect impact on community facilities would result from operation of the proposed Project.

According to NJDEP's Recreation and Open Space Inventory (ROSI) (NJDEP 1996) and a Green Acres Program letter dated November 22, 2017, three properties within the 500-foot study areas of Preferred Alternative Project Component G are Green Acres encumbered. However, no construction from the proposed Project will occur within these 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 proposed Project will not impact properties encumbered by NJDEP Green Acres (see Appendix D).

As described in Chapter 6, “Air Quality,” and Appendix B, “Air Quality Technical Appendix,” the proposed Main Facility (Preferred Alternative Project Component A) would utilize combined-cycle natural gas turbine technology, and efficient and modern combustion equipment and control devices. Air quality modeling was conducted for the project using standard EPA modeling techniques and meteorological data. The receptor grid extended five miles from the facility’s stacks, more than covering the study area, and receptors were placed at schools, health care facilities, and other sensitive receptor locations, such as parklands. Impacts for all of the criteria pollutants were below the applicable ambient air quality standards at all receptors. Therefore, no significant air quality impacts would occur from the operation of the Main Facility. Preferred Alternative Project Component F includes a nanogrid (i.e., two emergency generators) at HBLR Headquarters that will provide emergency power to the southern portion of the HBLR independently of the microgrid during emergencies only. During normal conditions, both engines of the nanogrid would only be run for maintenance once a month for one hour. During emergency conditions, the nanogrid in Preferred Alternative Project Component F would be in full-time operation, but the commercial grid would not be producing power for Preferred Alternative Project Components F and G (i.e., by definition these would not be receiving power from the commercial grid), so emissions from operating the nanogrid during emergencies would be somewhat offset by the reduction in emissions from the reduced output of the commercial grid.

As indicated in Chapter 16, “Safety and Security,” the operation of the Build Alternative would not result in adverse health or safety impacts at community facilities or to the general public. Based on the electrical characteristics of the transmission system, no electromagnetic field (EMF) effects on public health would occur. Additionally, under evacuation scenarios, commuters would have access to designated central meeting points, such as schools, hospitals, and safe shelters.

Operation of the Main Facility would employ approximately 30 full-time staff, who may or may not reside locally. As a result, there would be little measurable population impact (if any) attributable to the proposed Project and thus, operation of the new facility would not place additional demand on community services or have an adverse impact on the ability of local service providers to provide such services.

Operation of the Main Facility is not expected to have an adverse impact on the ability of local departments to provide police and fire services (or on the NJ TRANSIT Police Department). Preferred Alternative Project Components A and B would be fenced and access-controlled. Personnel would be on duty 24 hours a day and available to respond to concerns within the Main Facility. Onsite security features would minimize opportunities for theft and vandalism. The Main Facility would have its own fire prevention, protection, and fire detection system. This would include a non-water based fire suppression system and dedicated water storage system, hose stations, and fire pump systems. Water storage dedicated to fire protection use would be provided onsite in accordance with or exceeding code requirements. Facility staff would receive basic fire suppression training, which would cover only small fires that can 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. The Main Facility would be designed to allow full access for firefighting and hazardous materials response vehicles.

4.4 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS MITIGATION MEASURES

Under normal operating conditions, there would be no impact (adverse or favorable) to community facilities, parkland, or publicly-accessible open space resources in the project area. Since the Build Alternative will provide resilient electric power to Amtrak and NJ TRANSIT rail lines, including during emergency conditions that disrupt the commercial power grid, there would be a realized positive impact for the local community to have access to central meeting points. The proposed Project would not result in temporary or permanent impacts to parkland or Green Acres/6(f) parkland properties, and no further documentation is required. As a result, mitigation measures for the Build Alternative are not required.

Chapter 5 Socioeconomic Conditions

5.1 INTRODUCTION

A project could affect social conditions if it results in impacts on the local population or causes a change in neighborhood cohesion or character. As such, this chapter examines the potential for the Build Alternative to affect social conditions, including neighborhood character and relevant population characteristics. This chapter also assesses the potential effects on economic conditions. The analysis considers the same study areas as identified in Chapter 3, “Land Use, Zoning and Public Policy.”

5.2 METHODOLOGY

The assessment of potential socioeconomic conditions includes:

- Two study areas defined as follows:

  1) The proposed Project area plus a 500-foot buffer on either side of the electrical line routes, new substations, HBLR Headquarters and HBLR alignment. The proposed Project area is defined as the potential construction footprint of the Build Alternative, and includes the:

     - Main Facility and natural gas pipeline connection to the Main Facility (Preferred Alternative Project Components A and B);
     - Railroad right-of-way that would be used for the proposed electrical lines (Preferred Alternative Project Components C, D, E and optional routing for Project Component D);
     - NJ TRANSIT-owned HBLR Headquarters property on Caven Point Avenue (Preferred Alternative Project Component F);
     - HBLR right-of-way (Preferred Alternative Project Component G).

  2) A two-mile study area that includes the area within a two-mile radius of the Main Facility’s stacks on the Koppers Koke Site.

- Presentation of 2016 American Community Survey (ACS) data from the U.S. Census Bureau for each census tract in the study areas and comparison to relevant county and state data for population density, elderly population, and disability status. In addition, population projections from the North Jersey Transportation Planning Authority (NJTPA), the region’s Metropolitan Planning Organization, are presented to highlight future population trends (NJTPA 2017). While some of the census tracks are only partially within a study area, for the purpose of this analysis, these census tracts were evaluated as if they were fully within the study areas. The census data for Kearny, NJ (location of the Main Facility) is presented at the census block group level. As stated in FTA's Environmental Justice Circular, "Small area Census data such as blocks and block groups is generally more appropriate for projects and local planning activities. Large scale Census data, such as tracts and counties, may be more appropriate for Statewide and metropolitan planning activities." Given the extent of the project alignment, the proposed Project is qualified as a metropolitan project and therefore census tract level data are appropriate for electrical lines in Jersey City, Hoboken, Bayonne, Weehawken and Union City. However, as the Main Facility could have impacts that are more localized, census block groups were assessed for this portion of the proposed Project.

- Assessment of the potential effect on neighborhood cohesiveness and community character.
- Estimated number of permanent jobs that would be generated by the proposed Project.

Data on race/ethnicity and poverty rates, and the potential for impacts to minorities and low-income populations are included in Chapter 19, "Environmental Justice."

5.3 AFFECTED ENVIRONMENT

Socioeconomic conditions in the study areas for Project Components A through G are discussed below.

5.3.1 Population Density

The 80 census tracts and two census block groups used for analysis of demographic data are shown in Figures 5-1 and 5-2, while population density per square mile is presented on Figures 5-3 and 5-4. Since the census block group where the Main Facility is proposed (census tract 127, block group 6) is primarily industrial and open space, no population or demographic data are available for this census block group. It should also be noted that census tract 9801 in Jersey City comprises Liberty State Park, and therefore no demographic information is available for this census tract. Although no residential areas are located in the Kearny, Lyndhurst, or Secaucus portions of the study area, population data for these areas are included in this analysis as there are residential areas within the overall census tracts, but outside of the study area. As mentioned above, to be comprehensive, those portions of the census tracts that are not within the study area were still included as part of this assessment. The 500-foot buffer for Project Component D within Kearny includes census tract 127, block group 5, which has a population of 832 and a population density of 529; however, this number reflects those residing in the Hudson County Correctional Facility that is located near the southern tip of the Kearny peninsula (U.S. Census 2016). The nearest resident to the Main Facility site is located approximately 0.7 miles away in Jersey City.

Hudson County is one of the most populous counties in the state of New Jersey, with 10,687 residents per square mile of total area in 2016. Within Hudson County, the towns of Kearny and Secaucus have the lowest population densities at about 4,109 and 2,753 residents per square mile, respectively while West New York and Union City have among the highest at about 51,888 and 55,172 residents per square mile, respectively (U.S. Census 2016).

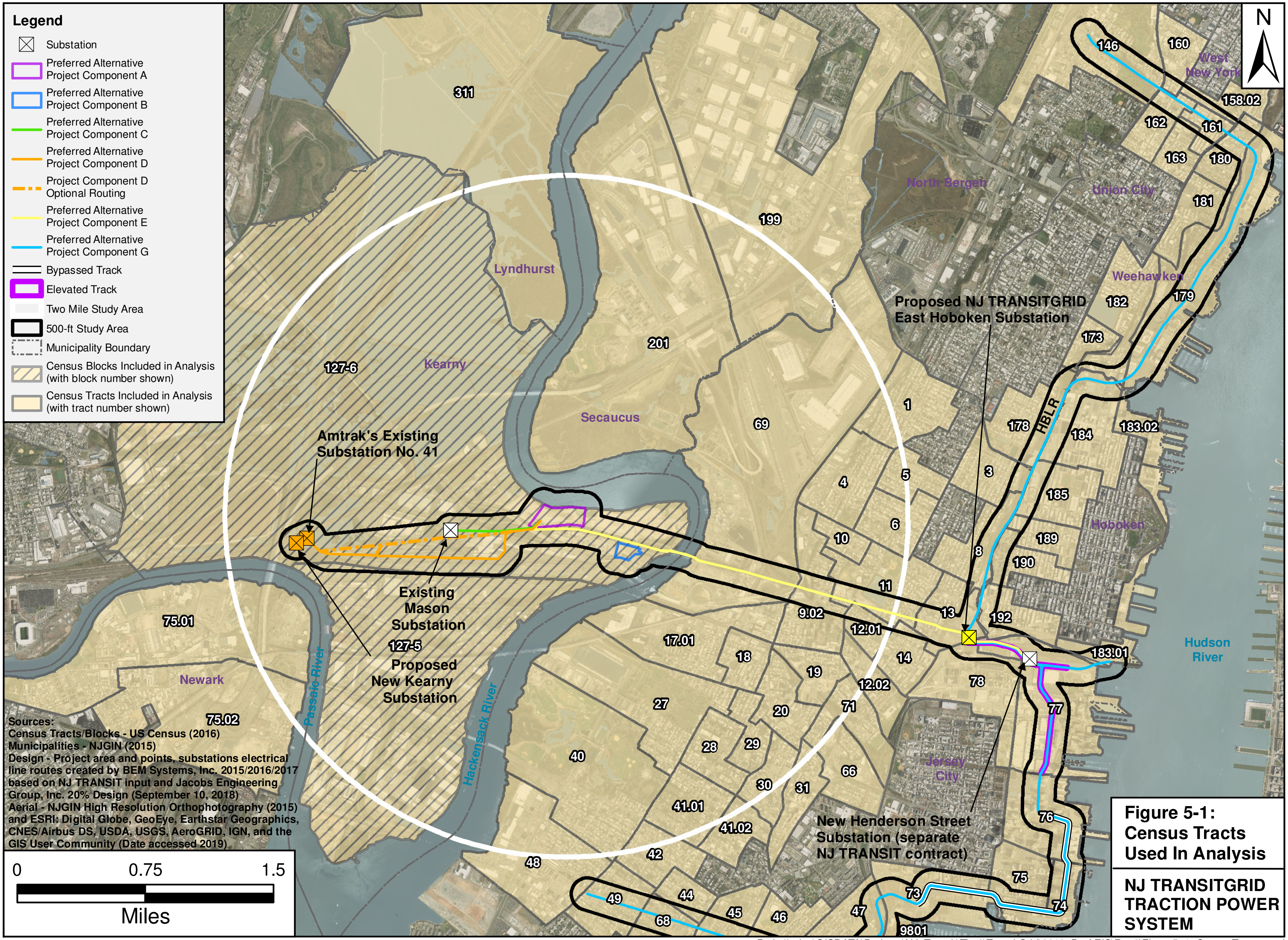

Figure 5-1: Census Tracts Used In Analysis

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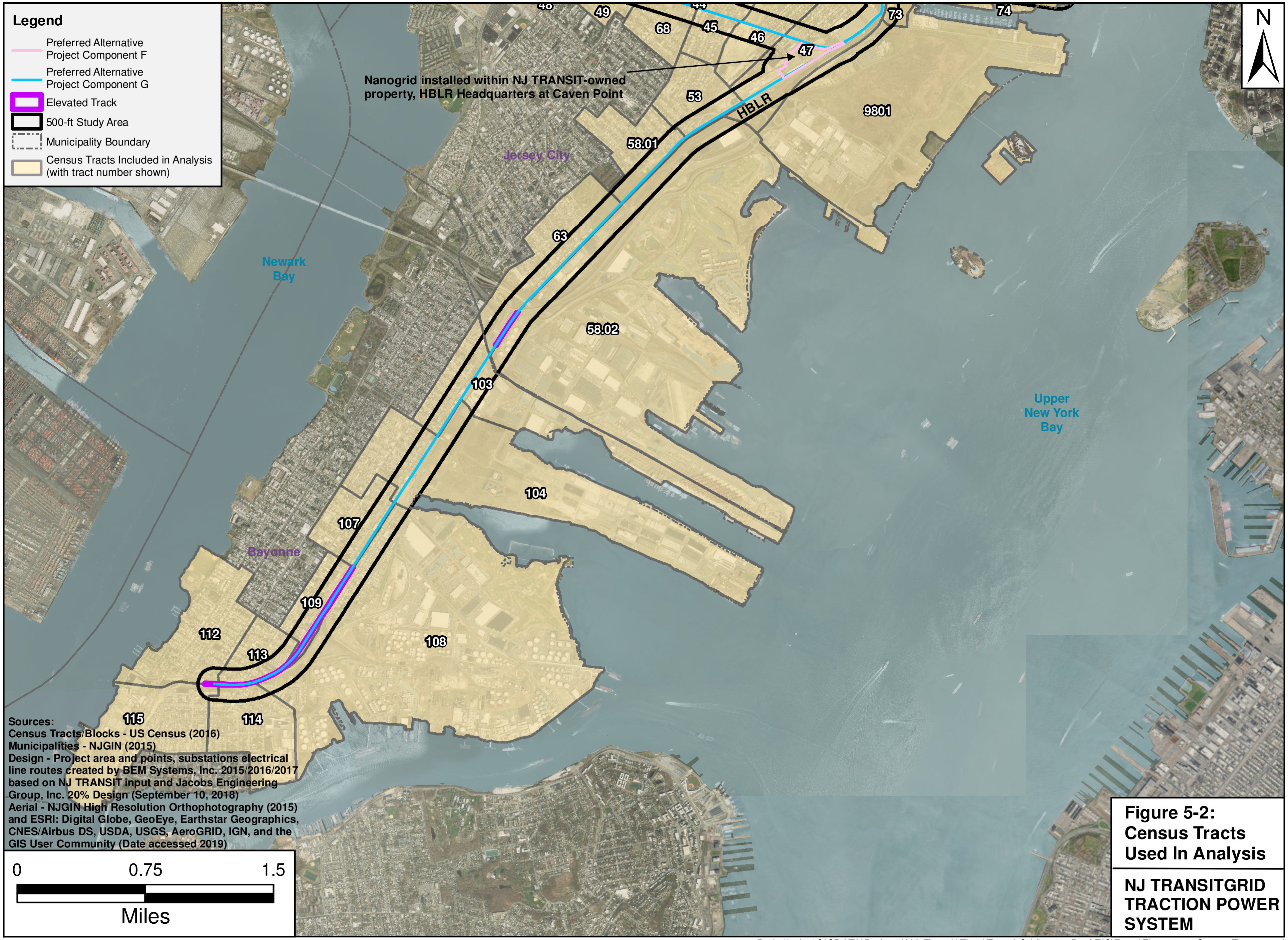

Figure 5-2: Census Tracts Used In Analysis

NJ TRANSITGRID TRACTION POWER SYSTEM

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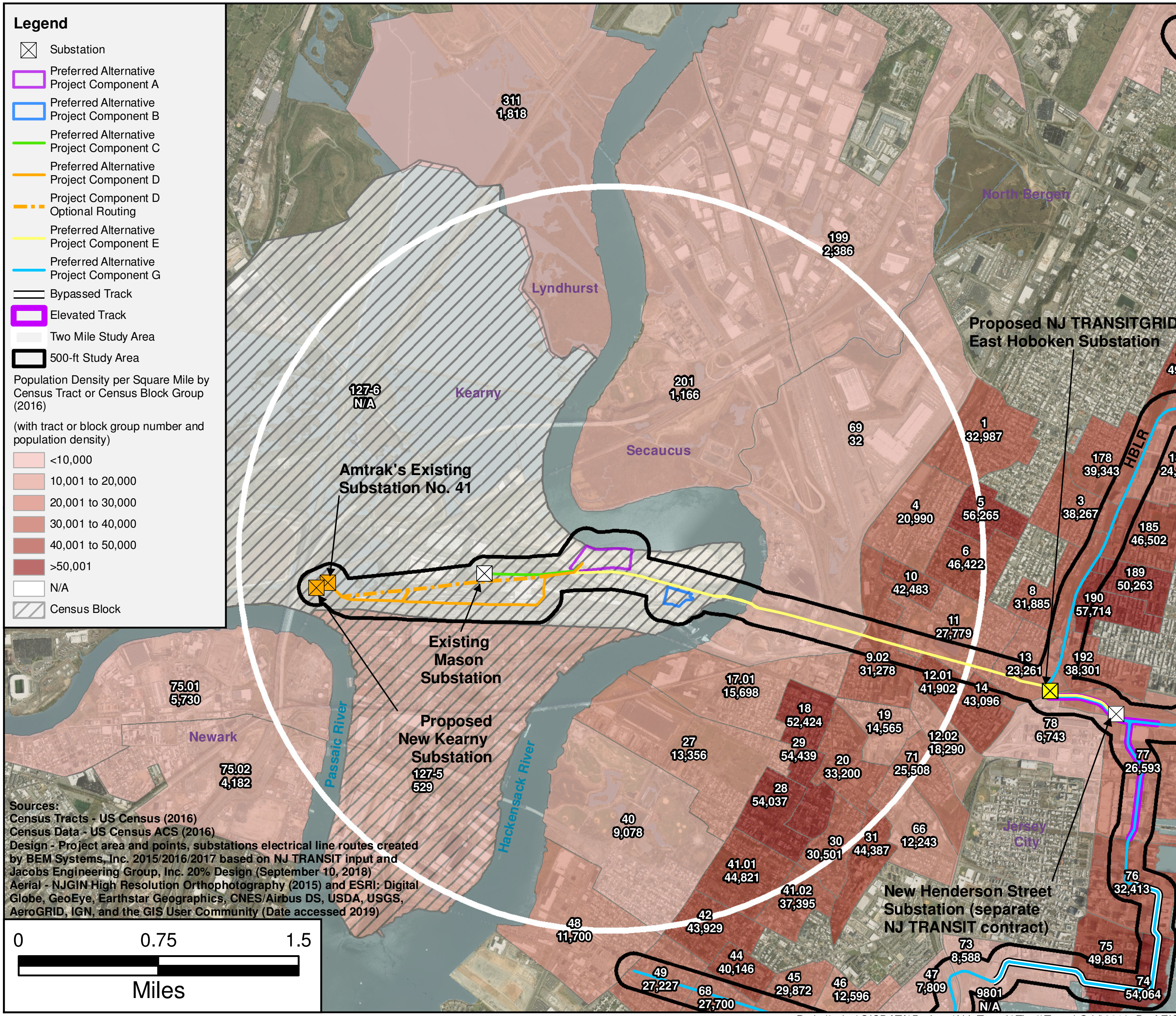

Figure 5-3: Population Density per Square Mile (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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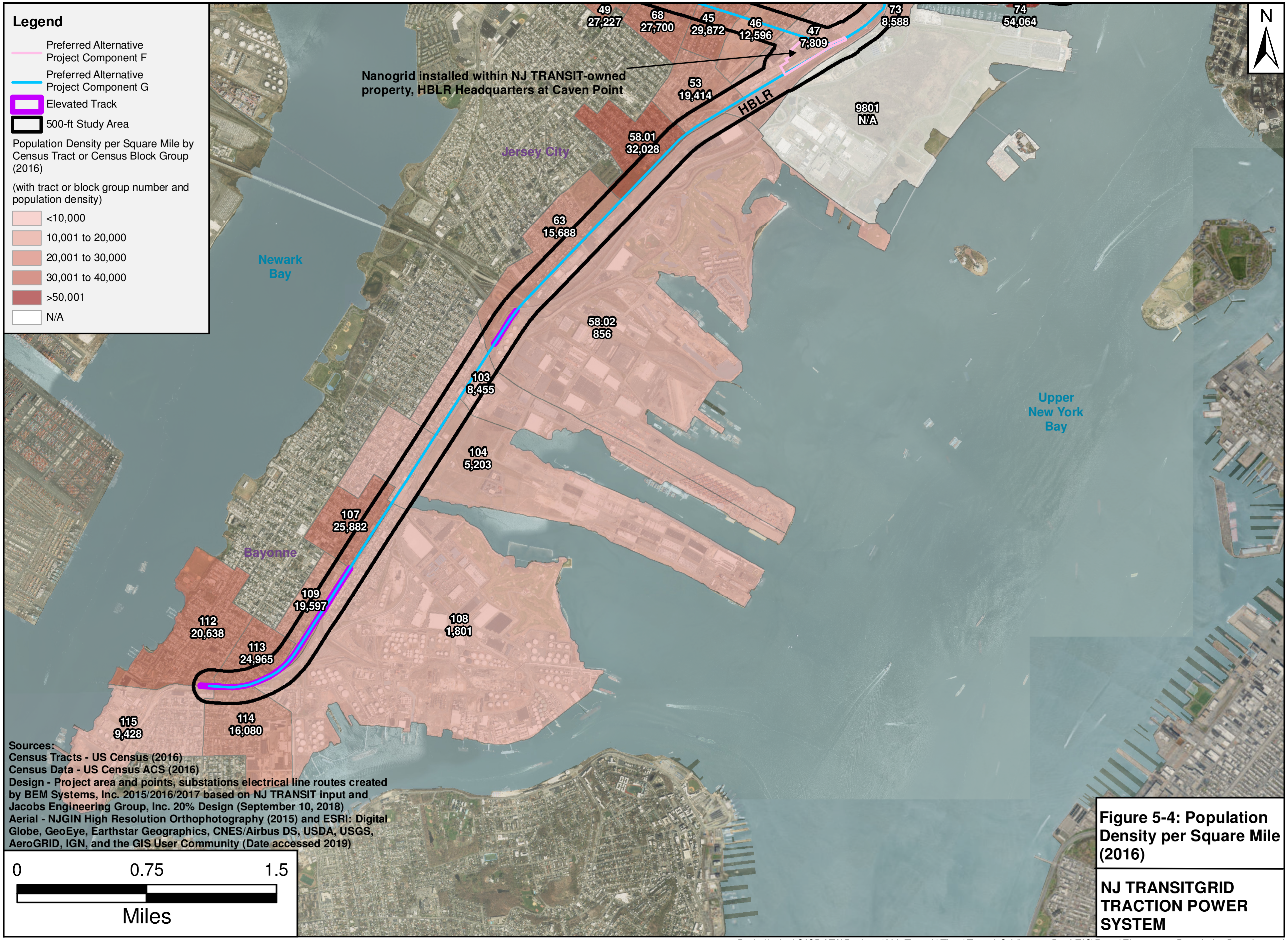

Sources:
Census Tracts - US Census (2016)
Census Data - US Census ACS (2016)
Design - Project area and points, substations electrical line routes created by BEM Systems, Inc. 2015/2016/2017 based on NJ TRANSIT input and Jacobs Engineering Group, Inc. 20% Design (September 10, 2018)
Aerial - NJGIN High 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 5-4: Population Density per Square Mile (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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The population density per square mile in the two-mile study area ranges from 32 in census tract 69 in Jersey City to 56,265 in census tract 5, also within Jersey City. The census block groups in Kearny and census tracts in Jersey City and Secaucus, closest to Project Components A and B, have very low population densities and are primarily industrial in nature. The population density increases along Project Component E through Jersey City and into Hoboken. The census tracts closest to HBLR Headquarters (Project Component F) are also lower in population density (U.S. Census 2016).

The population density per square mile by census tract (census block group in Kearny, NJ) was compared to that of the State of New Jersey and New Jersey counties and municipalities within the study area, see Table 5-1.

Table 5-1 Population Density per Square Mile by Municipality, County, State

Area	Population Density per Square Mile
Town of Kearny	4,109
Jersey City	12,317
Hoboken City	26,083
Township of Lyndhurst	4,360
City of Newark	10,716
Township of Weehawken	16,878
Township of West New York	51,888
Township of North Bergen	9,925
City of Bayonne	11,301
Union City	55,172
Town of Secaucus	2,753
Hudson County	10,687
Essex County	6,108
Bergen County	3,755
New Jersey	1,020

Source: *U.S. Census 2016*

5.3.2 Population Projections

Population projections from NJTPA indicate relatively low growth rates for the towns and counties in the study area (see Table 5-2). However, Jersey City is reportedly the fastest growing metropolitan area in New Jersey and currently has 7,000 housing units under construction and another 19,000 units planned (Fulop 2017). Development would continue to be focused in the areas near the Grove Street and Journal Square PATH stations in Jersey City, which offer short commutes to Manhattan. These areas are greater than one mile from the Main Facility (Preferred Alternative Project Component A).

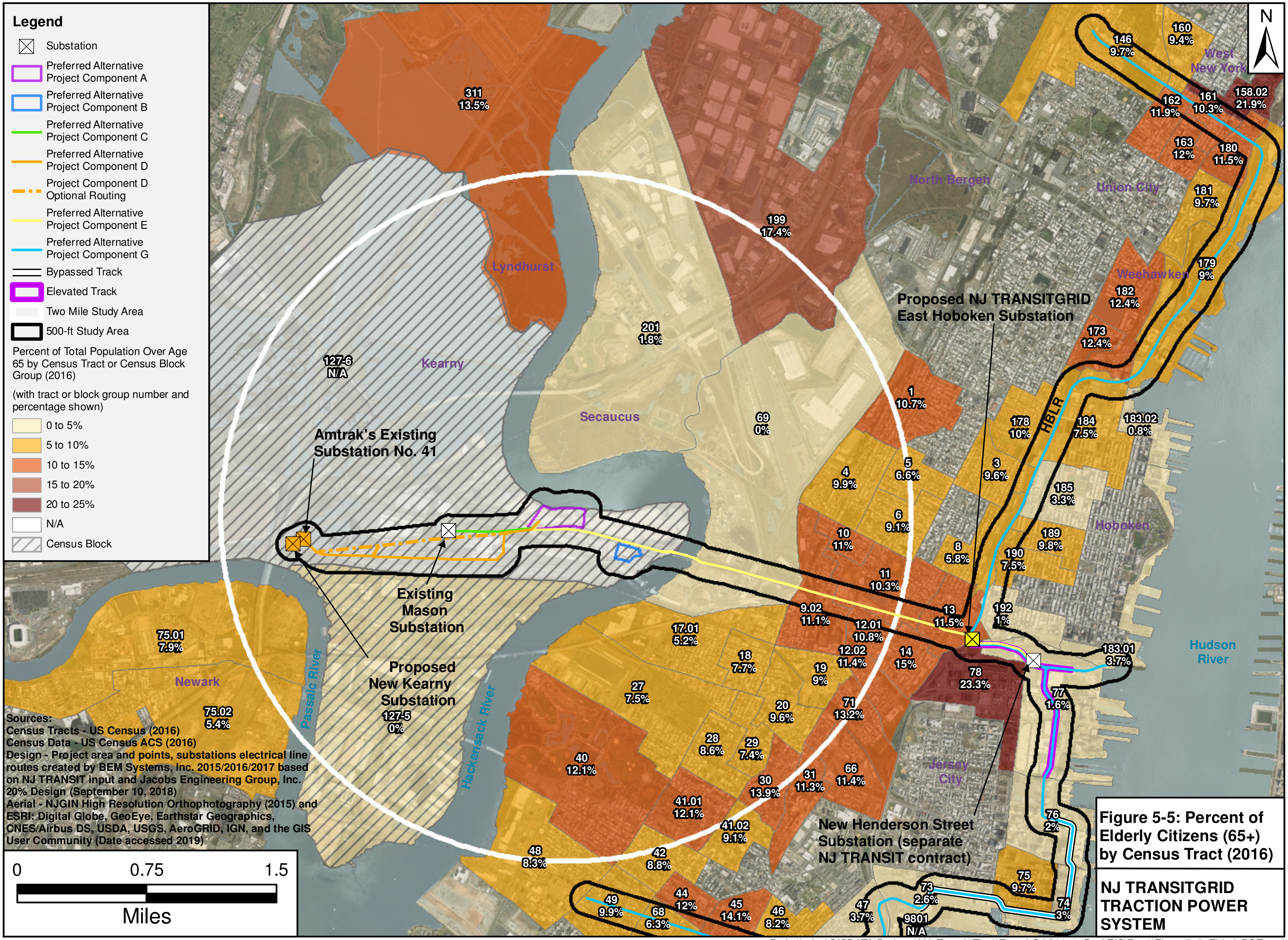
Table 5-2 NJTPA Population Projections

Area	2015 Population	2045 Population	Annualized % Population Change 2015-2016
Town of Kearny	41,693	44,757	0.2%
Jersey City	260,335	369,381	1.2%
Hoboken City	52,899	55,899	0.5%
Township of Lyndhurst	21,039	23,989	0.4%
City of Newark	282,102	328,809	0.7%
Township of Weehawken	13,706	14,868	0.3%
Township of West New York	52,236	55,219	0.2%
Township of North Bergen	62,374	67,599	0.3%
City of Bayonne	65,606	70,939	0.3%
Union City	68,390	71,954	0.2%
Town of Secaucus	18,147	19,910	1.1%
Hudson County	664,767	815,684	0.8%
Essex County	790,342	909,021	0.5%
Bergen County	928,735	1,030,503	0.4%

Source: *NJTPA 2017*

5.3.3 Percentage Elderly and Disabled

The percentage of elderly citizens (above age 65 years) in 2015 ranged from 0 percent (census tract 127, block group 5 and census tract 69) to 23.3 percent (census tract 78) within the 80 census tracts with documented population within the two study areas. The percentage of elderly citizens and disabled persons within the study areas are presented in Table 5-3 and Table 5-4 and on Figures 5-5 through 5-6 and 5-7 through 5-8, respectively. The percentage of elderly citizens per census tract was compared to that of the state of New Jersey (14.7 percent), the Town of Kearny (11.6 percent), Jersey City (9.7 percent), Hoboken City (6.1 percent), City of Newark (9.1 percent), City of Secaucus (16.2 percent), Town of Lyndhurst (16.1 percent), Township of Weehawken (11.0 percent), Township of West New York (11.9 percent), Township of North Bergen (13.1 percent), City of Bayonne (13.4 percent), Union City (10.4 percent), Hudson County (10.7 percent), Essex County (12.5 percent), and Bergen County (16.0 percent) (U.S. Census 2016). Although the Township of Lyndhurst has a higher elderly population than the state of New Jersey, the percentage is similar to the percentage in Bergen County, where Lyndhurst is located.



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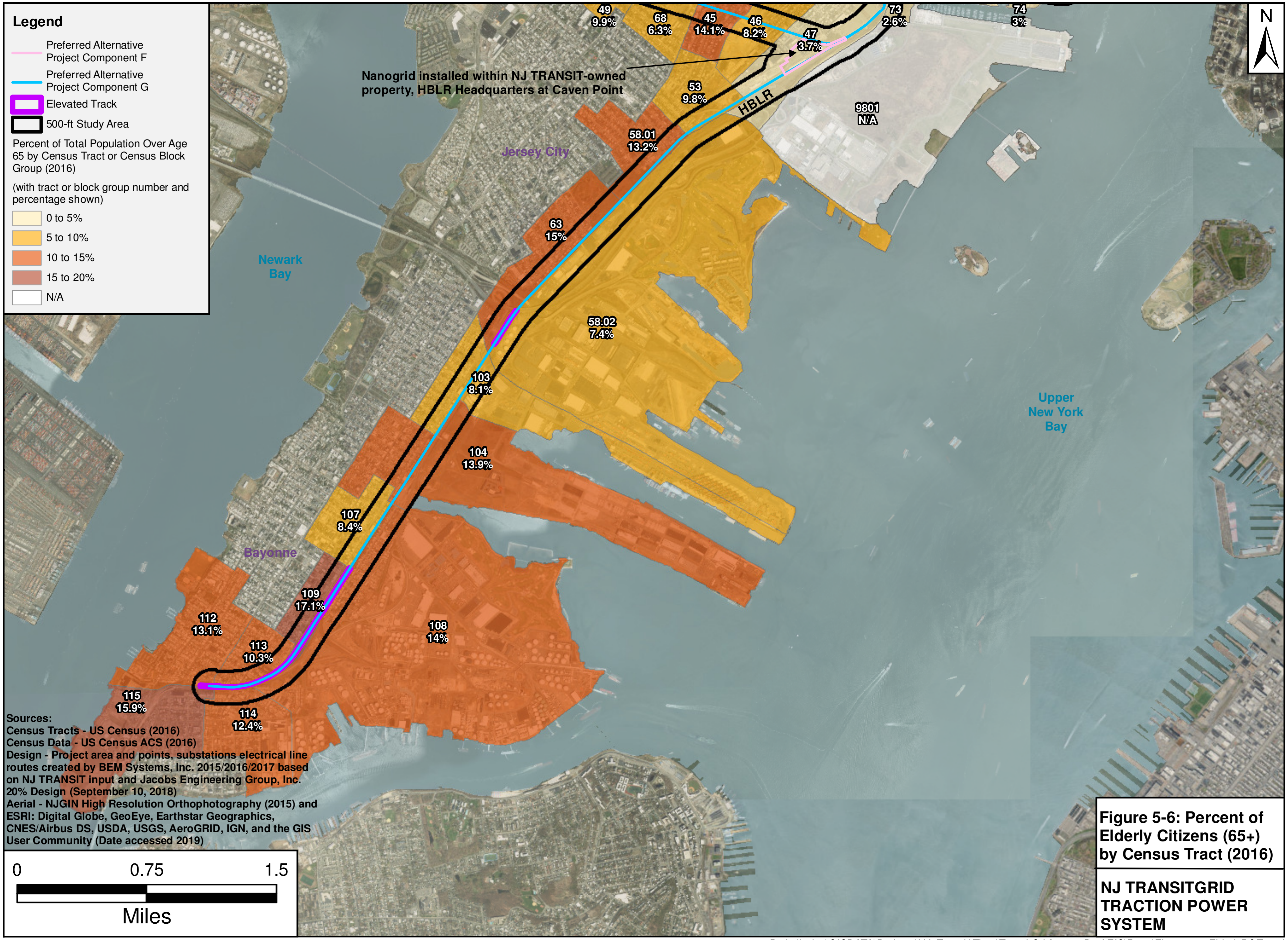

Figure 5-6: Percent of Elderly Citizens (65+) by Census Tract (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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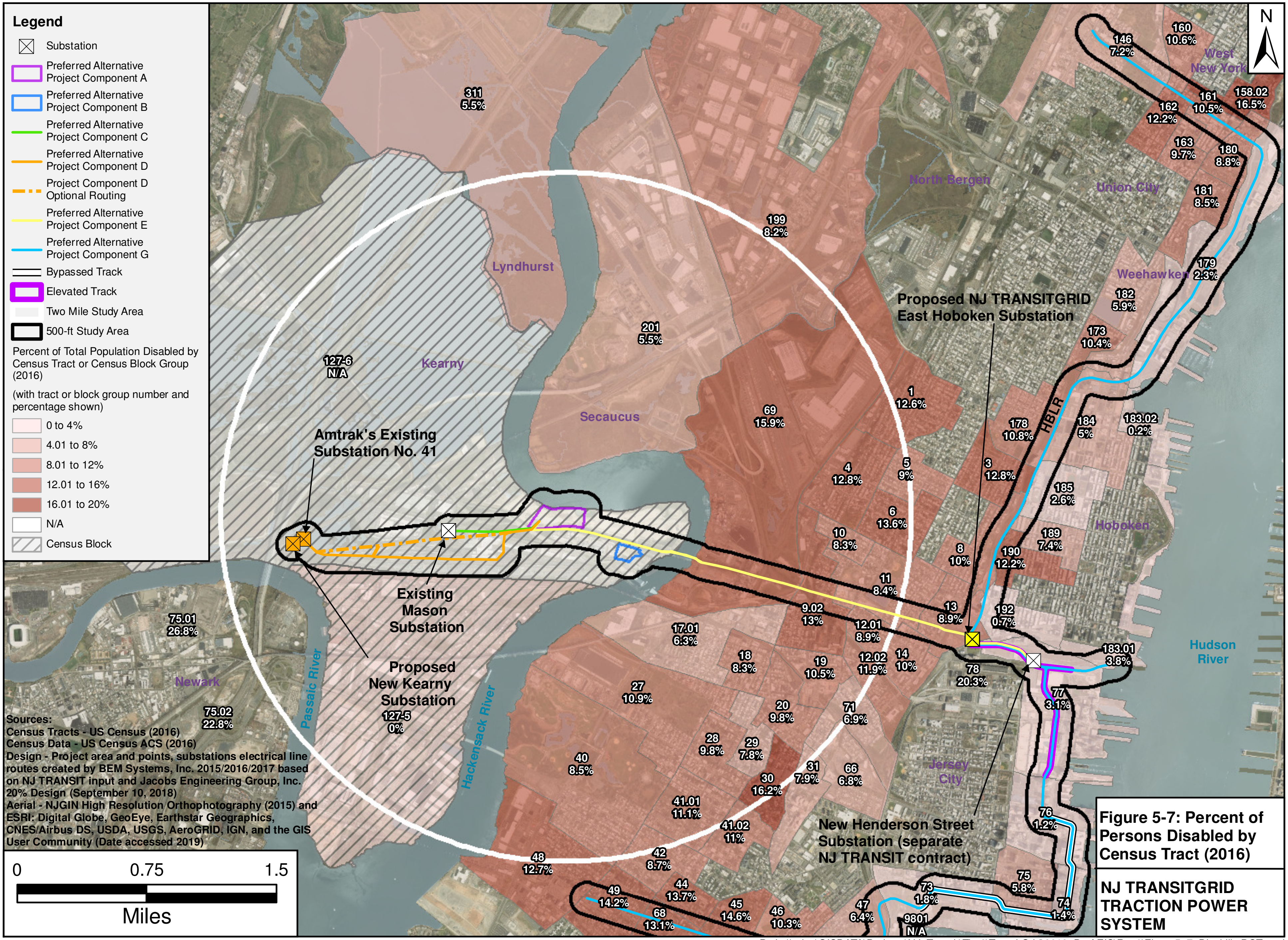

Figure 5-7: Percent of Persons Disabled by Census Tract (2016)

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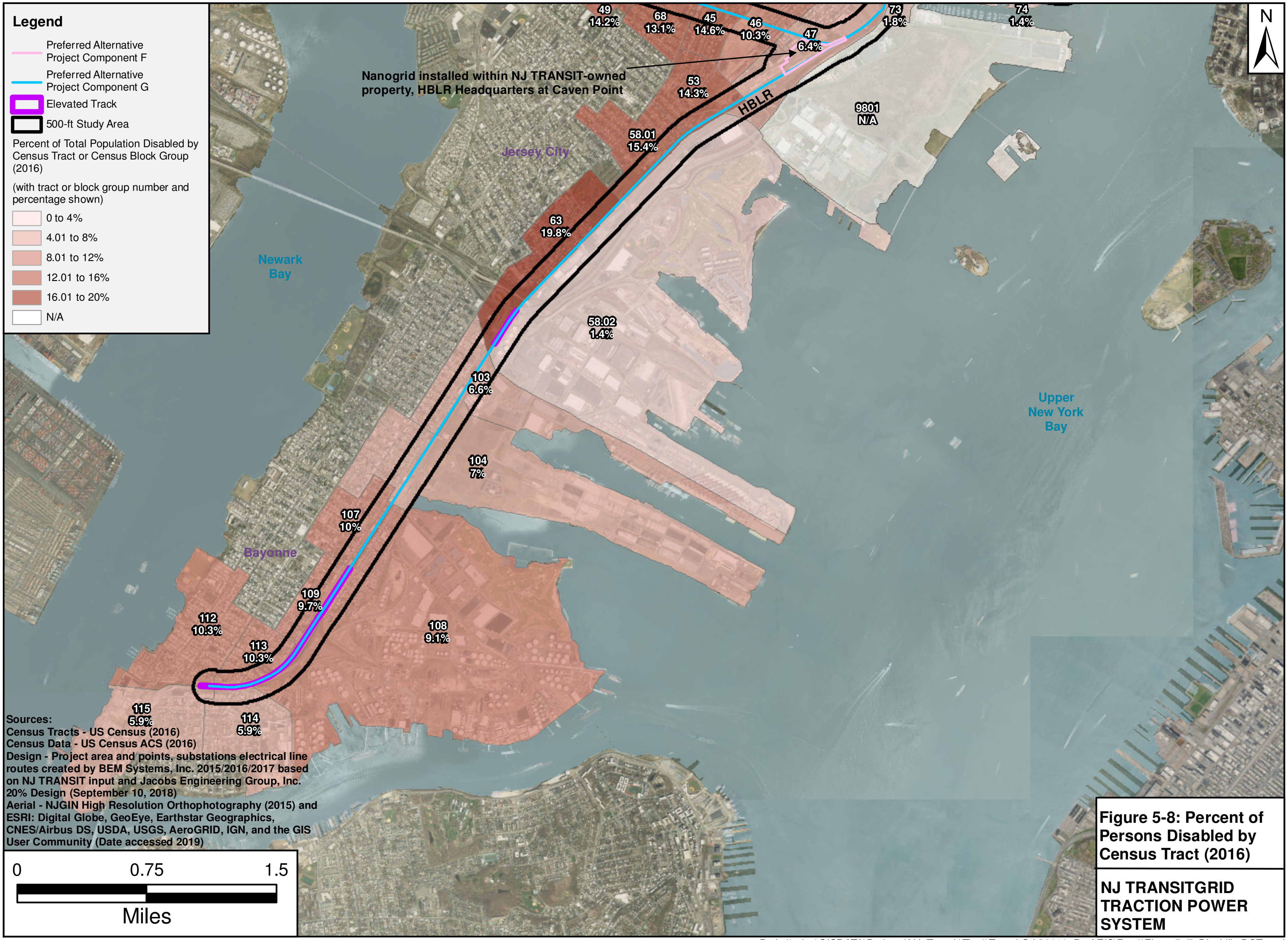

Legend

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

Percent of Total Population Disabled by Census Tract or Census Block Group (2016)

(with tract or block group number and percentage shown)

- 0 to 4%
- 4.01 to 8%
- 8.01 to 12%
- 12.01 to 16%
- 16.01 to 20%
- 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 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)

0 0.75 1.5
Miles

Figure 5-8: Percent of Persons Disabled by Census Tract (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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Table 5-3 Percentage of Elderly Citizens by Municipality, County, State

Area	Percentage of Elderly Citizens
Town of Kearny	11.6
Jersey City	9.7
Hoboken City	6.1
Township of Lyndhurst	16.1
City of Newark	9.1
Township of Weehawken	11.0
Township of West New York	11.9
Township of North Bergen	13.1
City of Bayonne	13.4
Union City	10.4
Town of Secaucus	16.2
Hudson County	10.7
Essex County	12.5
Bergen County	16.0
New Jersey	14.7

Source: *U.S. Census 2016*

The percentage of disabled persons in the 80 census tracts and two census block groups within the two study areas in 2016 ranged from 0.2 percent (census tract 183.02) to 26.8 percent (census tract 75.01). Census tract 75.01 in Bayonne contains the highest percent (26.8 percent) of disabled persons in the study area. The median of the range is comparable to the percentage of disabled persons living in the state of New Jersey (10.5 percent), Town of Kearny (9.4 percent), Jersey City (9.9 percent), Hoboken City (5.7 percent), Township of Lyndhurst (11.5 percent), City of Newark (13.7 percent), City of Weehawken (6.7 percent), Township of West New York (10.1 percent), Township of North Bergen (9.6 percent), City of Bayonne (8.9 percent), Union City 10.0 percent), Town of Secaucus (10.3 percent), Hudson County (9.4 percent), Bergen County (7.6 percent), and Essex County (11.2 percent) (U.S. Census 2016).

Table 5-4 Percentage of Disabled Citizens by Municipality, County, State

Area	Percentage of Disabled Citizens
Town of Kearny	9.4
Jersey City	9.9
Hoboken City	5.7
Township of Lyndhurst	11.5
City of Newark	13.7
Township of Weehawken	6.7
Township of West New York	10.1
Township of North Bergen	9.6
City of Bayonne	8.9
Union City	10.0
Town of Secaucus	10.3
Hudson County	9.4
Essex County	11.2
Bergen County	7.6
New Jersey	10.5

***Source: U.S**. Census 2016*

5.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

5.4.1 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 Site.

In the absence of the proposed Project, Amtrak plans to completely replace and rebuild Substation No. 41. The existing lattice towers in Cedar Creek Marsh South will be replaced with a monopole. 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). Since NJ TRANSIT-owned property is exempt from property tax obligations, any land acquired by NJ TRANSIT would not generate tax revenue for the municipalities in the Meadowlands District. In addition, the Koppers Koke Site is in a redevelopment zone that is tax exempt and therefore any development in this area would not generate revenue for the municipalities in the Meadowlands District. As such, under the No Action Alternative, properties will be taken off the tax rolls as part of NJ TRANSIT's property tax exemptions. No changes to social conditions would be expected under the No Action Alternative and no new employment opportunities would be realized.

5.4.2 Build Alternative

The Build Alternative would not increase commuter rail service, and would not affect population or otherwise induce population growth or development. There would be no direct or indirect displacement of businesses or residences in the study areas. Electrical lines would be installed within existing, active railroad corridors that are prevalent with utility lines. As discussed in Chapter 16, "Safety and Security," there would be no impact to the public from electromagnetic fields (EMFs). 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, components of the proposed Project would not affect neighborhood cohesiveness or demographics. Construction of the proposed Project, including installation of new monopoles, would be consistent with the existing railroad infrastructure and the general characteristics of the study areas. Therefore, the Build Alternative would not adversely affect attributes that contribute to community character, such as air quality, visual considerations, and public safety.

Similar to the No Action Alternative, since NJ TRANSIT-owned property is exempt from property tax obligations, the 26 acres that would be acquired for Project Components A and B would not generate tax revenue for the municipalities in the Meadowlands District[8]. As with the No Action Alternative, the Koppers Koke Site is in a redevelopment zone that is tax exempt and therefore any development in this area would not generate revenue for the municipalities in the Meadowlands District. Some temporary jobs would be created during construction, which is expected to last no more than 48 months. A small number of permanent jobs would be created to operate the Main Facility (approximately 30 full-time positions), which would not be expected to meaningfully affect employment statistics or the economic base of the study area, but nonetheless is a positive impact.

The proposed Project would benefit the regional economy during power outages of the commercial grid by providing a reliable electric power source to maintain regional mobility in the NJ TRANSIT and Amtrak core service territory. During an evacuation, commuters would have access to designated central meeting points, such as schools, hospitals, and safe shelters. Employees using public transportation can access important community facilities to direct public safety. Under normal conditions, the microgrid would generate "behind the meter" loads, which refers to a self-generating energy system that does not require energy from the commercial electric utility. Thus, the Build Alternative would provide for a more reliable

[8] There is a tax sharing program among the 14 municipalities that extends into the Meadowlands District.

electric system resulting in economic benefits related to improved resiliency and potentially improved ridership for commuters based on increased confidence during emergency situations.

5.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The Build Alternative would not result in adverse impacts on socioeconomic conditions; therefore, no mitigation is required. Under normal operations, there would be a positive impact with the creation of approximately 30 full-time positions. Under emergency operations, there would be a positive effect in that commuters, including elderly and disabled citizens, would have reliable transportation during commercial power grid outages. There would be no negative socioeconomic effects resulting from the proposed Project under normal or emergency operations.

Chapter 6 Air Quality

6.1 INTRODUCTION

This chapter assesses the potential operational air quality impacts of the No Action and the Build Alternative. Baseline conditions are first established by describing the applicable air pollutants for analysis as well as the relevant air quality standards, the air quality attainment status of the study area, and the most recent representative monitored ambient air quality data.

While the Build Alternative will affect both local and regional air quality levels, this analysis focuses on estimating potential localized air quality impacts in order to determine whether the emissions from operation of the Build Alternative would significantly impact air quality levels at nearby sensitive land uses (which are also referred to as “sensitive receptors”). There are two project components that could potentially affect air quality: Project Component A and Project Component F.

Preferred Alternative Project Component A includes the Main Facility with five natural gas-fired turbines, one steam-driven turbine which recycles heat waste as power, and two black-start engines. Under normal operating conditions, it is expected that up to four natural gas-fired turbines would operate continuously, with the fifth turbine acting as a back-up, and to allow for maintenance activities. For the air quality analysis, it was assumed that all five natural gas turbines would be operating continuously, to provide a conservative approach to the analysis. The steam-driven turbine would not contribute to air emissions as it has no emissions. The Main Facility of the microgrid (Preferred Alternative Project Component A) will be designed to operate during both normal conditions and emergency conditions, when the commercial grid is not available. The two black-start engines at the Main Facility would consist of natural gas-fired reciprocating engines that would drive two generators with an output of approximately 2.5MW each, which would only be used in emergency conditions to start the gas-fired turbines and would be run one hour per month for testing and maintenance under normal operating conditions. During emergency conditions, when the need for very precise power output is higher, the emission control systems may not be fully operational, but emissions generated by the proposed facility during an emergency would likely be offset by a reduction in emissions from the commercial plants that would be offline, and not contributing to regional emission levels. On a regional basis, it is anticipated that the effects of Preferred Alternative Project Component A of the Build Alternative on air quality would not be significant, as only clean burning natural gas and efficient and Best Available Technology combustion equipment and emission control devices would be used. In addition, the microgrid will be designed to operate in parallel with the commercial grid, providing dedicated power for railroad operations, thereby potentially offsetting commercial power grid supplies and reducing air emissions from the commercial grid to some extent under normal and emergency operating conditions.

Preferred Alternative Project Component F includes a nanogrid at HBLR Headquarters on Caven Point Avenue in Jersey City that will provide emergency power to the southern portion of the HBLR independently of the microgrid during emergencies only. The nanogrid would be energized by two approximately 2MW generators to provide emergency power run by two natural gas-fired reciprocating engines. During normal conditions, both engines of the nanogrid would only be run for maintenance once a month for one hour. During emergency conditions, the nanogrid in Preferred Alternative Project Component F would be in full-time operation, but the commercial grid would not be producing power for the HBLR (Preferred Alternative Project Component G [i.e., by definition these would not be receiving power from the commercial grid], so emissions from operating the nanogrid during emergencies would be partially offset by the reduction in emissions from the reduced output of the commercial grid.

The methodologies and assumptions used to assess the potential localized air quality impacts of Preferred Alternative Project Component A of the Build Alternative are discussed below (and in detail in Appendix B, "Air Quality Technical Appendix"), and a summary of the results of these analyses is provided in this chapter. Because nanogrid engines for Preferred Alternative Project Component F and the black-start engines would only be used during emergency conditions, their assessments are discussed briefly in this chapter, but not included in the detailed air quality analysis presented in Appendix B, "Air Quality Technical Appendix." Potential air quality impacts related to construction activities are presented in Chapter 17, "Construction Effects."

6.2 REGULATORY CONTEXT

6.2.1 Air Pollutants for Analysis

Several air pollutants have been identified by the EPA as being of concern nationwide. These pollutants, known as "criteria pollutants," are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). Ambient concentrations of CO are predominantly influenced by motor vehicle activity (i.e., mobile sources). Emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx) are associated with both mobile and stationary sources (e.g., industrial facilities, power plants, etc.). These can react to form O_3, which is the main constituent of smog. NO_2 is emitted from both mobile and stationary sources. Emissions of SO_2 are associated mainly with stationary sources. Emissions of particulate matter are associated mainly with stationary sources and diesel-fueled mobile sources (e.g., heavy trucks and buses). Lead emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced due to the elimination of lead from gasoline. Hazardous air pollutants (HAPs), also known as toxic air pollutants or air toxics, are emitted from both mobile and stationary sources, as well as natural sources (e.g., volcanic eruptions and forest fires). HAPs are pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. Ambient concentrations of each of these air pollutants will be impacted by the proposed project, and each of these air pollutants from the proposed Project are evaluated in this chapter.

Carbon Monoxide

CO is a colorless and odorless gas that is generated in the urban environment primarily by the incomplete combustion of fossil fuels in motor vehicles. In New Jersey, most of the CO emissions are from motor vehicles. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, or heart disease. CO concentrations can vary greatly over relatively short distances. Relatively high concentrations of CO are typically found near congested intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban "street canyon" conditions.

VOCs, Nitrogen Oxides, and Photochemical Oxidants (Ozone)

VOCs are emitted principally from the storage, handling, and use of fossil fuels. NOx constitutes a class of compounds that include NO_2 and nitric oxide, both of which are emitted by motor vehicles (e.g., cars, trucks and buses, and off-road equipment) and stationary sources (e.g., power plants). In addition to contributing to the formation of ground-level O_3 and fine particle pollution, NO_2 is linked with a number of adverse effects on the respiratory system. Both VOCs and NOx are also of concern because most of those compounds react in sunlight to form photochemical oxidants, including O_3. This reaction occurs comparatively slowly and ordinarily takes place far downwind from the site of actual pollutant emission sources. O_3 is a colorless toxic gas that interferes with the transfer of oxygen in the bloodstream, depriving sensitive tissues (e.g., brain and heart) of oxygen. The effects of VOCs, NOx, and O_3 are eye, nose, and throat irritation, as well as headaches, loss of coordination, and nausea. Long-term exposure may increase the risk of contracting respiratory diseases, such as asthma or chronic obstructive pulmonary disease.

Particulate Matter

Particulate matter is a broad class of air pollutants that exist as liquid droplets or solids, with a wide range of sizes and chemical composition. Particulate matter is emitted by a variety of sources, both natural and man-made. Natural sources include the condensed and reacted forms of natural organic vapors, salt particles resulting from the evaporation of sea spray, wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and debris from live and decaying plant and animal life, particles eroded from beaches, desert, soil and rock, and particles from volcanic and geothermal eruptions and forest fires. Major man-made sources of particulate matter include the combustion of fossil fuels such as vehicular exhaust, power generation and home heating, chemical and manufacturing processes, all types of construction (including that from equipment exhaust and re-entrained dust), agricultural activities, and wood-burning fireplaces. Fine particulate matter is also derived from combustion material that has volatilized and then condensed to form primary particulate matter (often after release from a stack or exhaust pipes) or from precursor gases reacting in the atmosphere to form secondary particulate matter. It is also derived from mechanical breakdown of coarse particulate matter (e.g., from building demolition or roadway surface wear). Of particular health concern are those particles that are smaller than or equal to 10 microns (PM_{10}) in size and 2.5 microns ($PM_{2.5}$) in size. The principal health effects of airborne particulate matter are on the respiratory system.

Sulfur Oxides

High concentrations of SO_2 affect breathing and may aggravate existing respiratory and cardiovascular disease. SO_2 emissions are generated from the combustion of sulfur-containing fuels (e.g., oil and coal) largely from stationary sources such as coal and oil-fired power plants, steel mills, refineries, pulp and paper mills, and nonferrous smelters. In urban areas, especially in the winter, smaller stationary sources such as residential boilers contribute to elevated SO_2 levels. Ambient SO_2 levels recorded in the area have complied with ambient air quality standards for over twenty years.

Lead

Lead emissions are principally associated with industrial sources and motor vehicles using gasoline containing lead additives. Lead poisoning can cause abdominal pain, constipation, headaches, irritability, memory problems, and tingling in the hands and feet. As the availability of leaded gasoline has decreased, motor vehicle-related lead emissions have decreased resulting in a significant decline of concentrations of lead and atmospheric lead concentrations in the region are well below national standards. Lead emissions are not expected to result from the burning of natural gas. Since natural gas turbines generate minimal amounts of lead emissions, an analysis of lead is not warranted.

Hazardous Air Pollutants

EPA is working with state and local governments to reduce air emissions of 187 toxic air pollutants, also known as HAPs, to the environment. These pollutants could be carcinogenic and/or damage the immune system, as well as cause neurological, reproductive (e.g., reduced fertility), developmental, respiratory and other health problems. Examples of toxic air pollutants include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry-cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by several industries. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

6.2.2 National/State Ambient Air Quality Standards

National Ambient Air Quality Standards (NAAQS) are concentrations for each of the criteria pollutants specified by EPA that have been developed primarily to protect human health. Secondary standards have been developed to protect the nation's welfare and account for the effect of air pollution on soil, water, vegetation and other aspects of general welfare. Based on how these pollutants adversely affect health, health-related averaging periods have also been established for these pollutants. These standards, together with their health-related averaging periods, are presented in Table 6-1.

New Jersey's ambient air quality standards are similar to the NAAQS but include a 12-month and a 24-hour secondary standard for SO_2; and 12-month and 24-hour primary and secondary standards for total suspended particulate matter. These were not considered in this analysis because the project's impacts on these pollutants over these time periods are considered to be minimal, but they will be considered as part of the Title V permitting process.

Table 6-1 National Ambient Air Quality Standards (NAAQS)

	Primary		Secondary	
	ppm	µg/m³	ppm	µg/m³
Carbon Monoxide (CO)				
8-Hour Average [(1)]	9	10,000	None	
1-Hour Average [(1)]	35	40,000		
Lead (Pb)				
Rolling 3-Month Average	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average [(2)]	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average [(3)]	0.070	150	0.070	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average [(1)]	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean	NA	12	NA	15
24-Hour Average [(4)]	NA	35	NA	35
Sulfur Dioxide (SO_2)				
1-Hour Average [(5)]	0.075	196	NA	NA
Maximum 3-Hour Average [(1)]	NA	NA	0.50	1,300

Notes:

ppm – parts per million (unit of measure for gases only)
µg/m³ – micrograms per cubic meter (unit of measure for gases and particles, including lead)
NA – not applicable
All annual periods refer to calendar year.
Standards are defined in ppm. Approximately equivalent concentrations in µg/m³ are presented.

(1) Not to be exceeded more than once a year.
(2) 3-year average of the annual 98th percentile daily maximum 1-hr average concentration, which is equivalent to the 8th highest concentration. Effective April 12, 2010.
(3) 3-year average of the annual fourth highest daily maximum 8-hr average concentration. EPA has lowered the NAAQS down from 0.075 ppm effective December 2015.
(4) Not to be exceeded by the annual 98th percentile (which is equivalent to the 8th highest concentration) when averaged over 3 years.
(5) EPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010. 3-year average of the annual 99th percentile daily maximum 1-hr average concentration (which is equivalent to the 15th highest concentration).

Source: National Primary and Secondary Ambient Air Quality Standards, 40 CFR 50 § [1970].

6.2.3 Attainment Designations

EPA has designated areas of the country as meeting (attainment) or not meeting (nonattainment) for the NAAQS on a pollutant by pollutant basis – these areas are known as attainment and nonattainment areas. Also, previously designated nonattainment areas that have demonstrated attainment are known as maintenance areas. When an area is designated as nonattainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the Clean Air Act (CAA), followed by a plan for maintaining attainment status once the area is in attainment.

6.2.4 Nonattainment New Source Review and Prevention of Significant Deterioration (NNSR/PSD) Increments

Projects that emit pollutants in nonattainment areas are required to offset emissions (i.e., reduce emissions elsewhere to compensate for emissions generated), and dispersion modeling is usually required to demonstrate that no new exceedances would occur and/or that the existing exceedance would not be exacerbated. Emissions are reviewed under the "Nonattainment New Source Review" (NNSR) program, which requires strict emission controls meeting the Lowest Achievable Emission Rate (LAER) with no regard to cost. The need for emission offsets is also determined as part of the permitting process.

PSD increments are the amounts of pollution an attainment/maintenance area is allowed to increase. PSD increments prevent the air quality in clean areas from deteriorating to the level set by the NAAQS. The NAAQS is a maximum allowable concentration "ceiling." A PSD increment, on the other hand, is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration (usually an existing condition concentration) for a pollutant. Significant deterioration is said to occur in an attainment area when the amount of new pollution would cause an exceedance of an applicable PSD increment. It is important to note, however, that pollutant levels are not permitted to deteriorate beyond the concentrations allowed by the applicable NAAQS regardless of the PSD increment. Air dispersion computer modeling is used to demonstrate compliance with PSD increments.

The proposed Project includes portions of Bergen, Essex, and Hudson Counties. All three counties are part of the Northern New Jersey-New York-Connecticut area designated as moderate non-attainment for ozone and maintenance for CO and $PM_{2.5}$. The area is in attainment for NO_2, SO_2, and PM_{10}.

Emissions of O_3 precursors (NOx and VOCs) will require LAER emission controls and offsets; however, since O_3 impacts are felt far downwind of an emission source, dispersion modeling for O_3 is not required under NNSR/PSD. The applicable PSD increments for these designations are provided in Table 6-2. Dispersion modeling has been performed to confirm compliance with the PSD increments and NAAQS.

Table 6-2 Applicable PSD Increments (µg/m³)

Pollutant	Averaging Period	PSD Increment
$PM_{2.5}$	24-hr Annual	9 4
PM_{10}	24-hr Annual	30 17
NO_2	Annual	25
SO_2	3-hr 24-hr Annual	512 91 20

Note: No PSD increments have been developed for CO, 1-hour NO_2, or 1-hour SO_2.
Source: 40 C.F.R. 52.21 [1990] - Prevention of Significant Deterioration of Air Quality, last amended March 30, 2011.

6.2.5 Applicable Emissions Regulations

Federal regulations applicable to a new power generating facility include the EPA's Title V and NNSR/PSD Emissions Offset Rule permitting requirements. In addition, New Source Performance Standards (NSPS) have been promulgated that establish allowable emission rates on a pollutant-by-pollutant basis that apply to all new fuel combustion systems. Also, EPA has developed Maximum Achievable Control Technology (MACT) standards to reduce the effects of HAPs generated by industry by establishing emission limits based on air toxic emission levels already achieved by the best-performing similar facilities.

EPA has delegated authority to administer these programs to the NJDEP. Applicable State regulations provided in the N.J.A.C. include SOTA criteria and RACT requirements. Additional N.J.A.C. regulations that may be applicable to the proposed facility include Title 7, Chapter 27, Subchapters 8 (N.J.A.C. § 7:27-8 Permits and Certificates for Minor Facilities and Major Facilities without an Operating Permit), 18 (N.J.A.C. § 7:27-18 Emission Offset Rules), and 22 (N.J.A.C. § 7:27-22 Title V Operating Permits).

In addition, in accordance with NJDEP permitting policy, all new or modified sources of air pollution applying for pre-construction or operating permits are required to conduct a risk assessment for air toxics if they emit certain amounts of these contaminants. As such, an air toxics analysis was conducted in accordance with New Jersey's Risk Assessment for Air Contaminant Emissions contained in NJDEP's Technical Manual 1003.

In general, Transportation and/or General Conformity requirements apply to proposed major projects in nonattainment or maintenance areas. However, the Build Alternative is exempt from these requirements (for both operation and construction) since NJ TRANSIT is designing it to conform with the approved emissions budget for the area through the Title V permitting process (see 40 CFR 93.153(d)(1)). Consultation with NJDEP on the Title V permitting process has been initiated and is ongoing.

6.2.6 Emission Control Requirements of Applicable Regulations

An operating permit is a comprehensive regulatory document that is enforceable. It lists all air pollution sources including combustion equipment, air pollution control devices, and the rules and regulations that apply to the facility as well as operational requirements, emission limits, and monitoring and reporting requirements. Permitting requirements are determined by the type of source, operation of the source, potential emissions, and the location of the facility.

Emission control technologies are required on a pollutant-by-pollutant basis under the NNSR/PSD program. If a proposed facility is classified as a “major” facility for a pollutant in a nonattainment area, the use of LAER technology (i.e., with no regard to costs) and emission offsets may be required for that pollutant. If the plant’s permitted emissions are estimated to be below the threshold limits for pollutants in attainment with NAAQS, less restrictive best available control technology (BACT) requirements will apply to that pollutant. BACT/LAER determinations will be completed for the selected turbine types and sizes based on an analysis of the EPA database of recent permits, and BACT/LAER analyses of recent NNSR/PSD applications. These requirements will be determined by NJDEP on a case-by-case basis.

Emission controls may also be required under the MACT and NSPS programs based on the type of emission source, and to meet New Jersey’s RACT and SOTA requirements.

Based on estimated emission rates of the preferred equipment configuration for the Build Alternative, it is anticipated that the use of Dry Low NOx (DLN) combustion, SCR, and oxidation catalyst systems will be required to successfully permit the proposed facility in accordance with NJDEP and EPA requirements. These technologies, which will be incorporated into the design of the microgrid and are assumed for this analysis, substantially reduce NOx and CO emissions and cause smaller reductions in VOC and HAP emissions. A wet injection system, which was not assumed for this analysis, may also be included to further reduce NOx emissions. Per the NJDEP Emission Offset Rule, N.J.A.C § 7:27-18, if NOx emissions exceed the 25 tons per year threshold level and is located in a non-attainment area for that criteria pollutant, then a one-time NOx emission credit purchase will be required to obtain a Title V permit. The final emission control requirements will be determined as part of the Title V permitting process.

6.2.7 Conformity with State Implementation Plans

The conformity requirements of the CAA and regulations promulgated thereunder (conformity requirements) limit the ability of federal agencies to assist, fund, permit, and approve projects in non-attainment or maintenance areas that do not conform to each applicable SIP. When subject to this regulation, the lead federal agency is responsible for demonstrating conformity of its proposed action. Conformity determinations for federal actions related to transportation plans, programs, and projects which are implemented, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601 et seq.) must be made in accordance with 40 CFR § 93 Subpart A (federal transportation conformity regulations). Conformity determinations for all other federal actions must be made according to the requirements of 40 CFR § 93 Subpart B (federal general conformity regulations).

Federal actions with the Federal Transit Administration (FTA) as the lead agency are subject to the transportation conformity regulations. An area's Metropolitan Planning Organization (MPO), together with the state, is responsible for demonstrating conformity with respect to the regional Transportation Improvement Programs (TIP). A TIP outlines the transportation projects proposed for the region over a five-year period. The analysis of transportation conformity for projects listed in the TIP includes the entire transportation network and all projects that are classified as regionally significant.

Conformity needs to be addressed for each pollutant of concern in a non-attainment or maintenance area affected by a federal action. Conforming actions would not:

- Cause or contribute to any new violation of any standard in any area;
- Interfere with provisions in the applicable SIP for maintenance of any standard;
- Increase the frequency or severity of any existing violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

According to the transportation conformity regulations, federal actions whose criteria pollutant emissions have already been included in the local SIP's attainment or maintenance demonstrations are assumed to conform to the SIP.

6.3 AFFECTED ENVIRONMENT

6.3.1 Meteorology and Climate

Local meteorological and topographical features influence the dispersion of plumes from the plant's exhaust stacks and greatly affect the impacts of a plant's emissions. To account for these factors in this analysis, five years of data collected by the National Weather Service at Newark Airport were used in the modeling analyses for this project to represent the types of meteorological conditions (wind directions, wind speeds, temperatures, mixing heights, etc.) experienced in the study area. The topography surrounding the project site was also included.

The dominant feature of the atmospheric circulation over North America is the broad, undulating flow from west to east across the middle latitudes of the continent. These "prevailing westerlies" shift north and south and vary in strength during the year, exerting a major influence on the weather throughout the State. Local meteorological data show that the prevailing wind directions are from the southwest and north. Lighter winds are most frequently from the southeast quadrant, while higher wind speeds are most often associated with westerly winds. Terrain in the study area is relatively flat and marshy. To the northeast are ridges oriented roughly in a south-southwest to north-northeast direction. They rise to an elevation of about 200 feet at 4.5 to 5 miles and to 500 to 600 feet at 7 to 8 miles.

6.3.2 Monitored Ambient Pollutant Levels

Representative monitored ambient air quality data for the project area are shown in Table 6-3. These data, which were, in general, collected from ambient monitoring stations closest to the Main Facility

(Preferred Alternative Project Component A), were used to develop the baseline data used in the modeling analyses. These baseline values were then added to predicted project impacts under the Build Alternative to estimate total pollutant concentrations.

These data were compiled by the NJDEP and are for the years 2013 through 2015, the latest calendar years for which data are currently available. Except for O_3, the monitored levels for all pollutants do not exceed national or State ambient air quality standards.

Table 6-3 Representative Monitored Ambient Air Quality Data for Criteria Pollutants 2015 to 2017

Pollutants and Averaging Times	Monitored Data				NAAQS	Monitoring Site Location
	2015	2016	2017	3 Year Avg		
Carbon monoxide (ppm) 8-hour (2nd Max)	1.6	1.4	1.1	NA	9	2828 Kennedy Blvd Jersey City, NJ
1-hour (2nd Max)	2.1	1.9	1.7	NA	35	2828 Kennedy Blvd Jersey City, NJ
Nitrogen dioxide (ppb) 1-hour (98th percentile) Annual (ppb)	57 16.53	58 16.26	56 15.04	57 NA	100 53	Veterans Park on Newark Bay, 25th Street near Park Road, Bayonne, NJ
PM_{10} (µg/m^3) 24-Hour (2nd Max)	43	32	32	NA	150	Consolidated Firehouse 355 Newark Avenue Jersey City, NJ
$PM_{2.5}$ (µg/m^3) Annual Arithmetic Mean	9.0	9.5	8.14	8.4	12	Consolidated Firehouse 355 Newark Avenue Jersey City, NJ
$PM_{2.5}$ (µg/m^3) 24-Hour (98th percentile)	25.7	19.2	18.5	21	35	Health Department 714 31st Street Union City, NJ
Sulfur dioxide (ppb) 1-hour (99th percentile)	5	4	4	4	75	Veterans Park on Newark Bay, 25th Street near Park Road, Bayonne, NJ
Sulfur dioxide (ppb) 3-hour (2nd max)		4	3	3	NA	Veterans Park on Newark Bay, 25th Street near Park Road, Bayonne, NJ
Sulfur dioxide (ppb) 24-hour (2nd max)		2	1	0	NA	
Sulfur dioxide (ppb) Annual		0	0	0	NA	
Lead (ug/m^3) 3-month average		0	0	0	NA	

Notes:
1. NA = not applicable; ppb = parts per billion.

Source: NJDEP (Letter dated March 12, 2019).

6.4 ANALYSIS METHODOLOGY FOR THE MAIN FACILITY

6.4.1 Dispersion Model

The EPA Atmospheric Dispersion Modeling (AERMOD) model, which was used in this analysis, is a steady-state dispersion model that is most often used to estimate pollutant concentrations to determine compliance with regulatory requirements. The latest version of EPA's AERMOD stationary sources air quality dispersion model (version 16216r; USEPA, 2017) was employed to predict ambient pollutant concentrations resulting from the range of equipment configurations for the Build Alternative of the Main Facility (Project Component A) using reasonable worst-case assumptions. The model was utilized in this analysis in accordance with the NJDEP Division of Air Quality Technical Manual 1002, *Guideline on Air Quality Impact Modeling Analysis* (NJDEP 2009). Highlights of the modeling approach include the following:

- While multiple equipment and building configurations have been considered, the option of a large enclosed Main Facility building was assumed for this analysis. This option would affect local wind flow dispersion patterns the least, resulting in a more conservative pollutant concentration near the site boundary.
- Inputs to the model for the dispersion modeling analysis include the location and stack parameters of the five gas turbine stacks located on the roof of the main heating plant building; heating plant parameters for downwash calculations; calculated emission rates and stack parameters under each equipment configuration; five consecutive years of meteorological data (to capture typical and atypical weather characteristics); background pollutant concentrations; and applicable information on nearby land use and topography.
- The analysis was conducted using regulatory default options such as elevated terrain algorithms, calm processing routines, missing data processing routines, and the use of a 4-hour half-life for exponential decay of SO_2 for urban sources.
- An urban dispersion surface roughness length was applied in the model based on the land use and population density in a two-mile radius from the site (as required by Air Quality Technical Manual 1002).
- While not required by the Air Quality Technical Manual 1002, a broader receptor grid with a conservative five-mile radius from the site was also used to evaluate air quality.
- The AERMOD Building Profile Input Parameters algorithm was employed to estimate building profile input parameters for downwash effect calculations.
- This analysis applied the $PM_{2.5}$ special procedure incorporated into AERMOD, which calculates concentrations at each receptor for each year modeled, averages those concentrations across the number of years of data, and then selects the highest values across all receptors of the five-year averaged highest values.

- Analyses were conducted employing the downwash algorithm of the AERMOD model. This algorithm accounts for the effects of wind flows around physical structures.
- Equipment configurations that were examined included simple-cycle plants (i.e., only natural gas turbines), combined-cycle plants (i.e., natural gas turbines with heat recovery systems to run steam turbines), and a combination of the two configurations (i.e., some natural gas turbines with and some without heat recovery systems to run steam turbines).
- Results are particularly affected under design options with steam turbines that capture exhaust heat due to a lower stack exit temperature and exit velocity. For this analysis, two configurations of five natural gas turbines were modeled. A simple-cycle plant was evaluated, and a combined-cycle plant with heat recovery on all natural gas turbines to run two steam turbines was evaluated. While the addition of the heat recovery system and steam turbines would not increase the amount of emissions, it would change the dispersion of the emissions in the atmosphere. The current project design includes one steam turbine, which would reduce stack exit temperatures to a lesser extent, which would have a lower effect on nearby ground-level emissions concentrations.
- Additional applicable parameters incorporated into the modeling analysis, such as surface characteristics and land use, are discussed in the Air Quality Technical Appendix.

6.4.2 Receptors

Receptor sites (i.e., locations at which pollutant concentrations are estimated through dispersion modeling analyses) were selected at locations anticipated to be most impacted by emissions from the proposed Project. Receptor grids consisting of more than 14,000 discrete receptors and 700 boundary receptors were developed specifically for this analysis that contains five nested (overlapping) Cartesian grids. The grids have a total land coverage of 10 miles by 10 miles (16 kilometers by 16 kilometers) centered around the Main Facility (see Figure 4 in Appendix B). The Main Facility would be located approximately 0.7 miles from the nearest residential buildings in Jersey City, New Jersey, and approximately 2.7 miles from the nearest residential buildings in the Town of Kearny, New Jersey.

The following receptor grids were developed:

- Boundary receptors = 7.6 meters (m) (25 feet) spacing around the perimeter of the Project Development Area, delineating the area to which the public will not have access;
- Inner grid = 25 m (82 feet) spacing out to a distance of 500 m (1,641 feet);
- Second grid = 50 m (164 feet) spacing out to a distance of 1,000 m (3,281 feet);
- Third grid = 100 m (328 feet) spacing out to a distance of 5,000 m (3.1 miles); and
- Fourth grid = 250 m (820 feet) spacing out to a distance of 8,000 m (5 miles).

The 25-meter inner receptor spacing grid was extended to provide higher resolution in the vicinity of peak predicted impacts. For NO_2, the fourth grid was extended to a distance of 8,000 meters (five miles) from the Main Facility, with 250-meter spacing, in order to define the Significant Impact Area for this pollutant.

6.4.3 Stack Heights

The EPA Building Profile Input Program (BPIP) (EPA 1995) produces the model input information necessary to account for building wake effects, based on the dimensions of buildings in the vicinity of the stacks. The Plume Rise Model Enhancement (PRIME) version of BPIP (BPIPPRM) (Schulman et al. 2000) was used with the AERMOD atmospheric dispersion modeling system. BPIP uses a digitized blueprint of the facility's buildings and stacks as well as other nearby, existing structures.

Based on preliminary design, the height of the turbine exhaust stacks was evaluated at 150 feet above ground surface.

6.4.4 Air Toxics

Pollutants

The EPA AP-42 (Compilation of Air Pollutant Emissions Factors) lists numerous toxic pollutants associated with burning natural gas that have the potential to be emitted from the natural gas-fired combustion turbines. Of the toxic air pollutants emitted from combustion turbines, eleven individual toxic pollutants – acetaldehyde, acrolein, benzene, 1,3-butadiene, benzo(a)pyrene, ethylbenzene, formaldehyde, naphthalene, propylene oxide, toluene, xylenes – and a group of Polycyclic Aromatic Hydrocarbons (PAHs) are identified as potential pollutants. (EPA 2000)

Short-term and annual emission rates were estimated for each of eleven pollutants based on AP-42 emission factors and the heat input of turbines (with each natural gas turbine rated at 237 million British Thermal Units [MMBtu]/hour heat input). Annual emission rates are based on 8,760 hours of continuous operation per year, with five 22MW natural gas turbines, which would result in the greatest potential (i.e., worst-case) emission rate. Estimated hourly and annual emission rates of each pollutant together with computed hazardous quotients and cancer risks are provided in the Air Quality Technical Appendix.

Assessment Methodology

NJDEP utilizes two approaches to perform risk assessment for the Air Quality Permitting Program: risk screening and comprehensive risk assessment. Risk screening consists of a simplified first-level (conservative) screening procedure, and, if adverse health impacts are predicted, a more detailed second-level screening is required. First-level risk screening uses generalized worst-case assumptions and simple worksheet calculations to estimate cancer and noncancer risks from inhalation of emissions proposed in a permit application. In place of dispersion modeling, air impact values are used to estimate dispersion and dilution of emitted pollutants, and the resulting ambient air concentrations. For detailed analyses, EPA's AERMOD dispersion model is used following the same methodologies used for the criteria pollutant analysis.

The "NJDEP Division of Air Quality Risk Screening Worksheet for Long-Term Carcinogenic and Noncarcinogenic Effects and Short-Term Effects" was used for this first-level risk screening. The details of the methodologies used for both the screening-level and detailed analyses used for this project are provided in the Air Quality Technical Appendix.

6.5 EMISSION RATES OF THE MAIN FACILITY

Under the No Action Alternative, the microgrid facility would not be constructed and NJ TRANSIT and Amtrak would continue to rely on the existing commercial grid for traction power in the core service territory. The potential benefits to regional air quality, including possible reduced levels of criteria pollutants that would result from using clean burning natural gas and efficient modern equipment, would not be realized.

Preliminary estimates have been made to predict short-term and annual emission rates that would be generated by the gas-fired turbines under the Build Alternative and evaluated both a simple-cycle plant (with five 22MW natural gas turbines) and a combined-cycle plant (with five 22MW natural gas turbines, and steam-driven turbines). These emission rates were then used to determine whether the impacts of these conservative design configurations have the potential to significantly impact localized air quality levels. The conservative design configurations were used to evaluate the emission rates to determine the potential for significant impacts to localized air quality. These conservative design configurations assume full time operation of all equipment, which is not the anticipated normal operating scenario.

6.5.1 Worst-Case Combined-Cycle Emission Rates

The emission sources responsible for most of the potential emissions from this configuration are the five natural gas turbines. Maximum emission rates from these turbines under peak load conditions, therefore, are the focus of this worst-case atmospheric dispersion modeling analysis. It is assumed that all five turbines would operate 8,760 hours per year under full load. Subsequent modeling for the Title V permit will include consideration of operations over a range of turbine loads and operating scenarios.

Short-term and annual emissions of all pollutants from the proposed equipment have been estimated based upon emission factors associated with the application of LAER DLN+SCR control technology for

NOx, CO, and VOCs (HAPS); oxidation catalyst systems; NJDEP's SOTA emission standards; EPA's AP-42 emission factor for SO_2; and EPA's recently developed $PM_{2.5}$/PM_{10} emission factors. The PM emission factors used in this analysis are based on recent studies developed by EPA in 2010. It is estimated by the project's engineers that each gas-turbine will consume up to 237 MMBtu/hour of heat input and use SCR (per NJDEP SOTA) to control CO, NOx, and other emissions.

Emission rates estimated for the applicable pollutants as well as the stack parameters used in the analysis for the combined-cycle units are summarized in Table 6-4. The simple-cycle units would have a higher stack exit velocity, which would result in a lower impact to air quality.

Table 6-4 Stack Parameters and Per Unit Emission Rates Used in the Analysis of the Combined-Cycle Units*

Parameter	Units	Combined-Cycle
Fuel Type		Natural Gas
Ambient Temperature	degrees Kelvin	293 (68°F)
Percent Load Rate	%	100
Duct Burner Operation		No
Stack Diameter	feet	10
Stack Heights	feet	150
Stack Temperature	°F	300
Stack Exit Velocity	feet/second	33
NOx Emission Rate	grams/second	0.29
$PM_{2.5}$ Emission Rate	grams/second	0.0126
PM_{10} Emission Rate	grams/second	0.0152
SO_2 Emission Rate	grams/second	0.0179
CO Emission Rate	grams/second	0.209

* Data are per turbine

While it is possible that short-term emission rates would be higher under emergency conditions because the emission control systems may not be fully operational during these conditions, emergency conditions are not normally quantified because the number of times such a condition would occur, and the duration of each occurrence, is unknown. In addition, emissions generated by the proposed facility during an emergency would likely be offset by a reduction in emissions from the commercial plants that would be offline, and not contributing to regional emission levels.

6.6 ASSESSMENT OF POTENTIAL AIR QUALITY IMPACTS FROM THE MAIN FACILITY

6.6.1 No Action Alternative

Under the No Action Alternative, the microgrid would not be constructed and NJ TRANSIT and Amtrak would continue to rely on the commercial grid for traction power in the core service territory, which includes facilities that burn oil and coal. The potential benefits to regional air quality, including possible reduced levels of criteria pollutants that would result from using clean burning natural gas and efficient modern equipment would not be realized. The benefits provided by the proposed 0.6MW solar generating facility at Preferred Alternative Project Component A would also not be realized.

6.6.2 Worst-Case Combined-Cycle Plant

The results of the modeling analysis are summarized in Table 6-5 and discussed below.

$PM_{2.5}$ Results

As shown in Table 6-5, the maximum estimated 24-hour and annual $PM_{2.5}$ impacts are less than the allowable PSD increments of 9 μg/m^3 and 4 μg/m^3, respectively. The maximum estimated total concentration, which includes the background concentration, is less than the 24-hour $PM_{2.5}$ NAAQS of 35 μg/m^3. The total annual $PM_{2.5}$ concentration with added background concentration is less than the annual $PM_{2.5}$ NAAQS of 12 μg/m^3. As such, the maximum potential impact of the $PM_{2.5}$ emissions is not considered to be significant.

PM_{10} Results

The maximum estimated 24-hour impact is less than the allowable PSD increment of 30 μg/m^3, and the maximum estimated total concentration is less than the 24-hour PM_{10} NAAQS of 150 μg/m^3. As such, the potential impact of the PM_{10} emissions is not considered to be significant.

NO_2 Results

The results of the analysis demonstrate compliance with 1-hour NO_2 NAAQS. The 8th highest daily maximum 1-hour NO_2 total concentration (which corresponds with the 98th percentile level, as defined in Table 6-1, with the added background concentration) is less than the 1-hour NO_2 NAAQS of 188 μg/m^3. In addition, the total annual NO_2 concentration, with added background concentration, is also less than the annual NO_2 NAAQS of 100 μg/m^3. As such, the potential impact of the NO_2 emissions is not considered to be significant.

CO and SO_2 Results

The results of the analysis for these pollutants are that the estimated maximum concentrations are below the applicable NAAQS for these pollutants. As such, the potential impacts of the CO and SO_2 emissions are not considered to be significant.

Therefore, the air quality impacts of the proposed facility emissions for the worst-case combined-cycle plant with five 22MW natural gas turbines are not considered to be significant.

Table 6-5 Maximum Predicted Pollutant Impacts for the Worst-Case Combined-Cycle Plant (μg/m³)

Pollutant	Averaging Period	Max Impact	Background Concentration	Total Conc.	NAAQS	Applicable PSD Increment
$PM_{2.5}$	24-hr	0.91	26	26.9	35	9
	Annual	0.14	10.4	10.5	12	4
PM_{10}	24-hr	1.1	41	42.1	150	30
	Annual	Negligible (1)	N/A (2)	N/A	N/A	17
NO_2	1-hr	26.8	107 (3)	133.8	188	N/A
	Annual	3.2	16.6 (3)	19.8	100	25
SO_2	1-hr 3-hr 24-hr Annual	1.7 Negligible (4) Negligible (4) Negligible (4)	20.9 N/A N/A N/A	22.6 N/A N/A N/A	196 N/A N/A N/A	N/A 512 91 20
CO	8-hr	18.1	1,889	1,907	10,000	N/A

Notes:
(1) Negligible based on the results of the 24-hour analysis.
(2) N/A = not applicable
(3) ppm values shown in Table 6-3 were converted to μg/m³.
(4) Negligible based on the results of the 1-hour analysis.

Based on the results of the modeling analysis of the worst-case scenario (i.e., the combined-cycle plant), no significant adverse air quality impacts would occur from the operation of the Main Facility for the Build Alternative. The results of the modeling analysis indicate that the Build Alternative would not result in criteria pollutant concentrations above the federal NAAQS or result in project impacts that exceed PSD increment levels since emission control technology for applicable pollutants is being incorporated into the design of the Main Facility. While it is possible that short-term emission rates would be higher under emergency conditions because the emission control systems may not be fully operational during emergencies, emergency conditions are not normally quantified because the number of times such a condition would occur, and the duration of each occurrence, is unknown. In addition, emissions generated by the proposed facility during an emergency would likely be offset by a reduction in emissions from the commercial plants that would be offline, and not contributing to regional emission levels.

6.7 ASSESSMENT OF POTENTIAL AIR TOXICS IMPACTS OF THE MAIN FACILITY

A conservative, screening-level HAPS analysis was conducted, as per NJDEP guidance, which assumed that all emissions from the turbines would be released from five 150-foot tall stacks, and that these units would be operating 8,760 hours per year. Both potential short-term effects and long-term risks were estimated.

The results of the short-term HAPS screening analysis, which are provided in the Air Quality Technical Appendix, show that the short-term hazard quotient (representing non-carcinogenic health effects) for each of the pollutants is less than 1. As such, the estimated short-term ambient impact is expected to be less than the reference concentration; therefore, the short-term non-carcinogenic health effect is negligible, and no further analysis is required.

The results of the long-term screening analysis, which are provided in the Air Quality Technical Appendix, indicate that long-term non-carcinogenic health effects are also negligible. However, results of the long-term HAPS screening-level analysis show that cancer risks for two carcinogens: formaldehyde (which account for about two-thirds of all HAPS emissions); and benzo(a)pyrene, which represents the group of PAHs, exceed the guideline value of one in a million. Because the first-level risk screening results exceed the guideline values, a more detailed analysis was conducted. This detailed analysis, using the AERMOD model, more accurately estimates ambient air concentrations by using anticipated annual operations, actual stack and source-specific data, and actual meteorological data.

According to EPA AP-42, *Compilation of Air Pollutant Emission Factors*, Section 3.1, *Stationary Gas Turbines*, utilizing an oxidation catalyst for CO emission control could also reduce HAPS emissions, particularly formaldehyde, by approximately 85 to 90 percent. Similar emission reductions are also applicable, as per EPA, for other VOC/HAPS pollutants. Because of uncertainties regarding the exact percent of control, and for the conservative purpose of this analysis, a lower control efficiency of 80 percent was applied to conservatively estimate formaldehyde (as well as benzo(a)pyrene) emissions impacts.

An analysis of formaldehyde, using the AERMOD model, was conducted for the more conservative combined-cycle plant configuration. The results were that the estimated cancer risk of formaldehyde would be less than the one-per-million EPA/NJDEP threshold. To estimate the benzo(a)pyrene cancer risk, the annual concentration of the benzo(a)pyrene was proportionally estimated from the concentration of the formaldehyde. The results were that the incremental cancer risk of benzo(a)pyrene was estimated to be less than one-per-million. Therefore, no significant impact of the VOC/HAPS emissions on either a short-term or annual basis is predicted based upon regulatory definitions.

6.8 ASSESSMENT OF BLACK-START ENGINE EMISSIONS

The Main Facility will include two natural gas-fired reciprocating engines, which would run two generators to provide start-up power for the Main Facility if no power is available from the commercial grid and the main turbines are not operating. Except for testing and maintenance, the engines would only be run long enough to start the Main Facility during emergencies.

While emissions would be generated from the engines, no quantitative air quality analysis was conducted for the black-start engines for the following reasons:

- With a small exception for testing purposes, the black-start engines would not operate under normal conditions. They would only operate under emergency conditions, which are not usually quantitatively considered in air quality analyses.

- During emergency operations, the emissions from the black-start engines would be offset by the reduction in emissions from the commercial power system, which, by definition, would not be supplying power to commercial customers in the area.
- Under normal conditions, each engine would only operate for maintenance purposes for only one hour per month. These short-term emissions would not measurably affect daily and annual criteria pollutant levels.

As such, the two natural gas-fired black-start engines at the Main Facility would not have a significant impact on air quality.

6.9 ASSESSMENT OF NANOGRID EMISSIONS

The nanogrid will be powered by two natural gas-fired reciprocating engines, which would run two generators to provide power to the southern portion of the HBLR. The engines would only be run full-time during emergencies, when commercial power was not available to the substations of the HBLR (Project Component G).

While emissions would be generated from the engines, no quantitative air quality analysis was conducted for the nanogrid for the following reasons:

- With a small exception for testing purposes, the nanogrid would not operate under normal conditions. It would only operate for extended periods under emergency conditions, which are not usually quantitatively considered in air quality analyses.
- During emergency operations, the emissions from the nanogrid would be offset by the reduction in emissions from the commercial power system, which, by definition, would not be supplying power to the substations of the HBLR (Project Component G).
- Under normal conditions, each engine would only operate for maintenance purposes for one hour per month. These short-term emissions would not measurably affect daily and annual criteria pollutant levels.
- As the nanogrid will be located several miles from the Main Facility, the impact of the nanogrid emissions during normal (testing) conditions on the maximum estimated air quality impacts of the microgrid emissions will be negligible.

As such, the two natural gas-fired engines for the nanogrid would not have a significant impact on air quality. This feature will be included in the Title V permit.

6.10 CONFORMITY WITH STATE IMPLEMENTATION PLANS

As an FTA action, the proposed Project is subject to federal transportation conformity regulations, but the proposed Project elements are not subject to federal general conformity regulations. The proposed Project is included in the Fiscal Year (FY) 2018-2021 TIP prepared by the North Jersey Transportation

Planning Authority (NJTPA), the authorized Metropolitan Planning Organization for the 13-county northern New Jersey region. In collaboration with the Interagency Consultation Group (ICG)[9, 10], the NJTPA has determined that the FY 2018-2021 Transportation Improvement Program for northern New Jersey conforms to the SIPs established by the New Jersey Department of Environmental Protection (NJDEP). The proposed Project was included in the TIP as an exempt project for the engineering, design, right-of-way acquisition, and construction phases, under NJTPA exemption code "MT6" for construction or renovation of power, signal, and communications systems. This addresses federal transportation conformity regulations. Stationary source emissions associated with the Main Facility will be accounted for in the applicable SIPs via the NNSR program, which is included in the New Jersey SIP. Therefore, as the proposed Project is included in a conforming TIP and would be subject to the NNSR program, no further conformity determination is warranted.

6.11 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

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; therefore, no mitigation is needed for this component. Any impact on air quality would be minimized through use of modern technology and could be further offset by reduced demand from the commercial power generation plant. While it is possible that short-term emission rates would be higher under emergency conditions because the emission control systems may not be fully operational during these conditions, emissions generated by the proposed facility during an emergency would likely be offset by a reduction in emissions from the commercial plants that would be offline, and not contributing to regional emission levels. Additional emission reduction controls technologies, however, may be incorporated into the proposed Project's design during the facility's Title V permitting process to further reduce emissions, which could reduce the NOx credits needed to be purchased for emissions greater than 25 tons per year.

Additionally, neither the normal operation nor the emergency operation of the reciprocating engines for the black-start engines at the Main Facility (Preferred Alternative Project Component A) or the nanogrid (Preferred Alternative Project Component F) would cause significant air quality impacts; therefore, no mitigation is needed for these components.

[9] The Interagency Consultation Group (ICG) is a group of stakeholders consisting of state and federal agency representatives empowered to guide the transportation conformity process, review and approve the conformity demonstration's assumptions and methodology, and fulfill the federal requirement of interagency consultation.
[10] EPA and USACE are Cooperating Agencies and NJDEP and other Federal and local agencies are Participating Agencies for the proposed Project. Cooperating and Participating Agencies and other stakeholders were involved through the scoping process, through regulatory coordination, and participation on the Technical Advisory Committee and will continue to be involved as the project moves forward.

Chapter 7 Greenhouse Gas Emissions

7.1 INTRODUCTION

This chapter evaluates potential changes to greenhouse gas (GHG) emissions associated with the operation of the Build Alternative. GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic (resulting from human activity), that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. Water vapor, carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere.

7.2 POLLUTANTS OF CONCERN AND METHODOLOGY

The EPA identifies GHGs that could potentially be included in the scope of an EIS: CO_2, N_2O, CH_4, and fluorinated gases, which include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). CO_2 is the primary pollutant of concern from anthropogenic sources. CO_2 is by far the most abundant GHG and is emitted from any combustion process (both natural and anthropogenic), including power generation and other industrial processes such as the manufacture of cement, mineral production, metal production, and from the decay of organic matter. CH_4 and N_2O are also emitted by power generation facilities. There are no significant direct or indirect sources of fluorinated gases associated with the operation of the Build Alternative; therefore, these pollutants were not included in the analysis.

In accordance with the EPA, emissions of the GHGs of concern are considered and expressed in terms of carbon dioxide equivalents (CO_2e). CO_2, CH_4, and N_2O differ in their ability to trap heat in the atmosphere; CO_2 has a heat trapping ability of 1; CH_4 has a greater heat trapping equivalent of 25, which means that each metric ton of CH_4 has a heat trapping equivalent of 25 metric tons of CO_2; and N_2O has a much greater heat trapping equivalent of 298. As such, the emission rates of each pollutant must be multiplied by its equivalent rate to convert it to CO_2e emission rates.

In light of the global scope of the impacts of GHG emissions, and the incremental contribution of each single action to global concentrations, the EPA recommends agencies use projected GHG emissions associated with proposed actions as a proxy for assessing the proposed actions' potential effects on climate change in a NEPA analysis. In accordance with this guidance, the GHG emissions of the Build Alternative were considered by taking into account the greatest potential annual operational emissions.

For the purposes of this analysis, direct emissions from the on-site combustion equipment were analyzed for the high end of the range of potential natural gas consumption to provide a conservative estimate of the maximum potential output from the Main Facility (Preferred Alternative Project Component A), which is approximately 140MW. Calculations were based on fuel consumption information from a review of relevant equipment specifications for the configuration that would result in the maximum potential natural gas consumption (and therefore emissions). The output is dependent on the load of combined cycle generation system, operating at higher power when the load is greater and operating at lower power when the load is reduced. “Normal” output will vary throughout the operating day. Baseload power is expected to utilize the combined cycle generation system at 60MW but will operate at 30MW when NEC load is reduced. The other units will participate in the PJM market and operate primarily during the grid peak load conditions when the pricing in the market is favorable. This is expected to be 4-7 hours per day, primarily during weekdays. For the Build Alternative, this was five 22MW natural gas turbines operating at full capacity 24/7 for the year, because the facility is specifically being designed to operate during both normal conditions and during emergency conditions (i.e., in islanded mode) when power from the commercial grid is not available. During emergency conditions when the need for very precise power output frequency is higher, it is possible that short-term GHG emission rates would be higher because the emission control systems may not be fully operational during these conditions. However, emergency conditions are not normally quantified because the number of times such a condition would occur, and the duration of each occurrence, is unknown. In addition, GHG emissions generated by the proposed facility during an emergency would likely be offset by a reduction in GHG emissions from the commercial plants that would be offline or underutilized, and not likely result in a net increase in regional GHG emission rates during those periods. Commercial sources which currently provide power to sections of NJ TRANSIT service areas include Jersey Central Power and Light (JCP&L) and Public Service Electric & Gas (PSE&G).

The project also includes a nanogrid, which would consist of two generators powered by two natural gas-fired reciprocating engines to provide electricity for traction and signals for the southern portion of the HBLR. Designated as Preferred Alternative Project Component F, it would be located at HBLR Yard and Shop. The output of these generators is approximately 2MW each for a total of up to 4MW from the nanogrid. These engines would be designed to run primarily during emergency conditions (i.e., islanded mode, when the commercial power supply was interrupted). However, under normal conditions, they would be run for one hour each month for maintenance, so they are a potential source of GHG emissions. Emissions were calculated for the 12 total hours each engine would be run annually, and these values were added to the emissions output of the Main Facility.

Emissions from fuel consumption estimates were converted to equivalent GHG emission estimates. Indirect emissions, such as from on-road vehicles are associated with employee commutes and deliveries, are considered to be minimal for this project when compared with the emissions from the natural gas turbines and were therefore not considered in this analysis. Under emergency conditions, the nanogrid engines would be operated continuously, until commercial grid power was restored, but the increase in emissions would be offset by reductions in emissions from the commercial grid, since it would not be supplying power to the substations that normally provide power to the southern portions of HBLR.

Indirect GHG emissions resulting from the operations of the Main Facility would include the emissions resulting from the offsite production of electricity. The ability to deliver electrical power from the commercial grid to the Main Facility would be available, but off-site power requirements for the Main Facility are expected to be minimal, as the Main Facility would be designed to meet its own power needs, even under emergency conditions. As noted above, the nanogrid engines which would supply the southern sections of the HBLR would be started during emergency conditions, and would not require off-site power, so would have no indirect emissions from their operation. Chapter 18, "Indirect Effects and Cumulative Impacts," presents a discussion of indirect emissions that result from the manufacture of equipment and materials required to construct the proposed Project.

7.3 POLLUTANTS OF CONCERN AND MAJOR EMISSION SOURCES

GHG emissions from the proposed Main Facility are predominantly attributable to the combustion of natural gas. The proposed Main Facility would not have any other industrial processes releasing GHGs and would not operate fleet vehicles. The greatest proportion of potential GHG emissions from the proposed project would be CO_2. While CH_4 and N_2O would be emitted in varying quantities depending on operating conditions, these emissions, although small when compared to total CO_2 emissions, were also considered.

In addition, while there would be other sources of GHG emissions associated with the proposed Main Facility, such as direct emissions from the emergency black-start generators, employee commuting, and truck deliveries (as well as construction-related emissions), these emissions are minimal when compared with the natural gas combustion emissions. As such, the estimation of CO_2e emissions for the Build Alternative focuses on emissions from the combustion of natural gas.

7.4 IMPACTS OF THE PROJECT ALTERNATIVES

7.4.1 No Action Alternative

Under the No Action Alternative, the microgrid would not be constructed and NJ TRANSIT and Amtrak would continue to rely on the commercial grid for traction power in the core service territory during normal conditions. During emergency conditions, traction power would not be available for NJ TRANSIT and Amtrak rail lines in this core service area and rail transportation would not be possible. Because of this rail service outage, less-efficient travel modes would be required compared to the current conditions. The potential benefits to regional air quality during emergency conditions (providing public transportation powered by clean-burning natural gas and more efficient and modern equipment, rather than the use of other modes of transportation with greater GHG emissions) would not be realized. In 2015, New Jersey GHG emissions for electrical generation were 17.7 MMTCO2e (of a total of 100.9 MMTCO2e). The current sources of NJ TRANSIT electrical power in 2018 was from natural gas (59.2%), nuclear (36.1%), renewables (3.3%), and coal (1.4%), according to U.S. Energy Information Administration.

Under the No Action Alternative, other planned and programmed transportation improvements would take place by 2021. These include projects for which commitment and financing have been identified 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. These projects are independent of the proposed Project and would not provide traction power for public transportation during emergency conditions.

7.4.2 Build Alternative – Main Facility Turbines

Preliminary estimates of CO_2e emissions that would be generated annually by the proposed plant with the greatest potential emissions (five 22MW natural gas turbines) have been estimated by conservatively assuming that each of the five gas turbines would consume 237 million Btu (MMBtu) gas turbines per hour and would operate continuously (8,760 hours per year). This is considered a high-end estimate because the turbines would not need to run at maximum capacity all of the time. The simple-cycle plant and the combined-cycle plant configurations would have identical GHG emissions because both would employ five 22MW natural gas turbines. Any additional steam turbines would be run from steam generated by exhaust heat from the natural gas turbines and would not require any additional natural gas usage, so would not increase emissions. Under this worst-case scenario, the Main Facility would generate the following amounts of GHG gases:

CO_2e Emission Rates

CO_2

Based on this worst-case scenario, the following equations were used to estimate the amount of CO_2 emissions associated with the worst-case Build Alternative:

$$\frac{237\ \text{MMBtu}}{\text{turbine-hour}} \times \frac{8{,}760\ \text{hours}}{\text{year}} \times 5\ \text{turbines} \times \frac{110\ \text{lb}\ CO_2}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = 570{,}933\ \text{tons of}\ CO_2\ \text{per year}$$

Where,

The factor of 110 lb of CO_2/MMBtu was obtained from EPA's AP-42 Table 3.1-2a, "Compilation of Air Pollutant Emission Factors." (EPA 2000)

As the global warming potential of CO_2 is 1, the CO_2e emission rate of CO_2 is also 570,933 tons per year.

In addition to CO_2, the other GHGs released from the combustion of natural gas are CH_4 and N_2O. Using emission factors also from AP-42's Table 3.1-2a, the following emission rates for each of these pollutants, as well as their CO_2 equivalents, are estimated as follows:

CH_4

$$\frac{237\ \text{MMBtu}}{\text{turbine-hour}} \times \frac{8{,}760\ \text{hours}}{\text{year}} \times 5\ \text{turbines} \times \frac{0.0086\ \text{lb}\ CH_4}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = 44.6\ \text{tons of}\ CH_4\ \text{per year}$$

Since the global warming potential of CH_4 is 25 times that of CO_2, the CO_2e emission rate for CH_4 is 1,115 tons per year.

N_2O

$$\frac{237\ \text{MMBtu}}{\text{turbine-hour}} \times \frac{8{,}760\ \text{hours}}{\text{year}} \times 5\ \text{turbines} \times \frac{0.003\ \text{lb}\ N_2O}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = 15.6\ \text{tons of}\ N_2O\ \text{per year}$$

Since the global warming potential of N_2O is 298 times that of CO_2, the CO_2e emission rate for N_2O is 4,649 tons per year.

CO_2e

The total amount of CO_2e generated by the worst-case Build Alternative, therefore, is estimated to be:

570,993 + 1,115 + 4,649 = 576,757 tons of CO_2e per year

The accidental release of methane would be a rare occurrence and can only occur when a unit is placed in maintenance mode for a controls upgrade by the original equipment manufacturer (OEM). During maintenance, the release would only consist of the gas downstream of the block valve and the gas turbine. To limit the volume released, the cross-section of piping will be minimized, which is a standard practice for power plant operations.

7.4.3 Build Alternative – Main Facility Black-Start Engines

The natural gas-fired reciprocating engines that would run the black-start generators for the Main Facility (Preferred Alternative Project Component A) would need to be run one hour per month for maintenance, for a total of 12 hours of operation per year for each engine.

The black-start engines would be sized approximately 2,175 brake horsepower (bhp[11]) each, and each would consume approximately 6,705 Btu per bhp-hour. Annual heat input for two black-start engines would be:

$$\frac{6{,}705 \text{ Btu}}{\text{bhp-hour}} \times 2{,}175 \text{ bhp} \times \frac{12 \text{ hours}}{\text{year}} \times \frac{1 \text{ MMBtu}}{1{,}000{,}000 \text{ Btu}} \times 2 \text{ engines} = 350.001 \text{ MMBtu per year}$$

This would contribute the following amounts of CO_2e emissions:

CO_2

$$\frac{350.001 \text{ MMBtu}}{\text{year}} \times \frac{110 \text{ lb } CO_2}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 19.25 \text{ tons of } CO_2 \text{ per year}$$

CH_4

$$\frac{350.001 \text{ MMBtu}}{\text{year}} \times \frac{0.0086 \text{ lb } CH_4}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 0.0015 \text{ tons of } CH_4 \text{ per year}$$

Since the global warming potential of CH_4 is 25 times that of CO_2, the CO_2e emission rate for CH_4 is 0.038 tons per year.

N_2O

$$\frac{350.001 \text{ MMBtu}}{\text{year}} \times \frac{0.003 \text{ lb } N_2O}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 0.0005 \text{ tons of } N_2O \text{ per year}$$

Since the global warming potential of N_2O is 298 times that of CO_2, the CO_2e emission rate for N_2O is 0.156 tons per year.

[11] bhp – "brake horsepower," which is power output in horsepower at the engine drive shaft under unloaded conditions. This is used to calculate the emissions for reciprocating engines using fuel-specific conversion factors.

The total amount of CO_2e generated by the Build Alternative for the two black-start engines would be 19.444 tons of CO_2e per year (Table 7-1).

Table 7-1 Greenhouse Gas Emissions (in Tons of CO_2e per Year) for Two Black-Start Engines in the Build Alternative

GHG Constituent	Emission Rate (lb/MMBtu)	Warming Potential Factor	Tons of CO_2e per year
CO_2	110	1	19.250
CH_4	0.0086	25	0.038
N_2O	0.003	298	0.156
		Total	**19.444**

7.4.4 Build Alternative – Nanogrid Engines

The natural gas-fired reciprocating engines that would run the nanogrid generators at the HBLR Headquarters (Preferred Alternative Project Component F) would need to be run one hour per month for maintenance, for a total of 12 hours of operation per year for each engine.

The nanogrid engines would be sized approximately 2,889 bhp each, and each would consume approximately 6,616 Btu per bhp-hour. Annual heat input for two engines would be:

$$\frac{6{,}616 \text{ Btu}}{\text{bhp-hour}} \times 2{,}889 \text{ bhp} \times \frac{12 \text{ hours}}{\text{year}} \times \frac{1 \text{ MMBtu}}{1{,}000{,}000 \text{ Btu}} \times 2 \text{ engines} = 458.737 \text{ MMBtu per year}$$

This would contribute the following amounts of CO_2e emissions:

CO_2

$$\frac{458.737 \text{ MMBtu}}{\text{year}} \times \frac{110 \text{ lb } CO_2}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 25.230 \text{ tons of } CO_2 \text{ per year}$$

CH_4

$$\frac{458.737 \text{ MMBtu}}{\text{year}} \times \frac{0.0086 \text{ lb } CH_4}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 0.0020 \text{ tons of } CH_4 \text{ per year}$$

Since the global warming potential of CH_4 is 25 times that of CO_2, the CO_2e emission rate for CH_4 is 0.049 tons per year.

N_2O

$$\frac{458.737 \text{ MMBtu}}{\text{year}} \times \frac{0.003 \text{ lb } N_2O}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 0.0007 \text{ tons of } N_2O \text{ per year}$$

Since the global warming potential of N_2O is 298 times that of CO_2, the CO_2e emission rate for N_2O is 0.205 tons per year.

The total amount of CO_2e generated by the Build Alternative for the two nanogrid engines would be 25.484 tons of CO_2e per year (Table 7-2).

Table 7-2 Greenhouse Gas Emissions (in Tons of CO2e per Year) for Two Nanogrid Engines in the Build Alternative

GHG Constituent	Emission Rate (lb/MMBtu)	Warming Potential Factor	Tons of CO_2e per year
CO_2	110	1	25.230
CH_4	0.0086	25	0.049
N_2O	0.003	298	0.205
		Total	**25.484**

7.4.5 GHG Impacts

The total estimated amount of CO_2e generated by the worst-case of the Build Alternative is 576,801.9 tons per year of CO_2e (576,757.0 + 19.4 + 25.5 = 576,801.9). This is only 0.47% of the 123,458,720 tons per year of CO_2e generated in the state of New Jersey (US Energy Information Administration [EIA] 2018). As discussed above, in 2015, New Jersey GHG emissions for electrical generation were 17.7 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 ("Climate Analysis Indicators Tool (CAIT) Version 2.0. (Washington, DC: World Resources Institute, 2014)" World Resources Institute. Retrieved 2019-01-08). In addition, since the Build Alternative would replace the source of electricity currently being produced by commercial power plants for NJ TRANSIT and Amtrak operations in the core service territory, during normal operating conditions there is the potential that a large percentage of the emissions generated by the Main Facility would be offset by corresponding reduction in CO_2e emissions by commercial power plants due to a reduction in demand for electricity from those sources as a result of the Proposed Project. The current sources of NJ TRANSIT electrical power in 2018 was from natural gas (59.2%), nuclear (36.1%), renewables (3.3%), and coal (1.4%), according to U.S. Energy Information Administration. During emergency conditions, when commercial power is not available, public transportation provided by the proposed Project would continue to be available. This could result in a reduction of GHG emissions during this time, as commuters would not be required to use modes of transportation (e.g., personal automobiles) that are less efficient.

In addition, all of the possible equipment options would be consistent with the 2015 update to the New Jersey State Energy Master Plan, which outlines the State’s energy goals and provides strategies and recommendations for reducing overall emissions from power plants. Specifically, the project helps meet Goal 2, “Promote a Diverse Portfolio of New, Clean, In-State Generation,” through the development of a microgrid project “to address enhanced energy resilience.” (New Jersey Board of Public Utilities and New Jersey Department of Environmental Protection 2015)

7.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The proposed Project is part of NJ TRANSIT's response to the need for increased resiliency in the face of severe weather or man-made events, that may occur more frequently or increase in severity in the future. The Build Alternative is consistent with state and federal policies aimed at minimizing GHG emissions by offsets to the existing commercial grid.

The Build Alternative, therefore, would not have a significant adverse GHG impact, and no mitigation measures are proposed to specifically reduce GHG emissions. Nevertheless, measures to reduce emissions would be incorporated into the design of the Main Facility, as per EPA recommendations. These include SCR and oxidation catalyst systems, which substantially reduce nitrogen oxide and carbon monoxide emissions, and cause small reductions in N_2O and CH_4 emissions. While it is possible that short-term GHG emission rates would be higher under emergency conditions because the emission control systems may not be fully operational during these conditions, GHG emissions generated by the proposed facility during an emergency would likely be offset by a reduction in GHG emissions from the commercial plants that would be offline, and not contributing to regional GHG emission levels. Additional measures may be identified in the Title V permitting process.

The energized assets of the proposed Project will be less reliant on electricity from the commercial power grid. The reduced commercial demand could offset some GHG emissions generated by older and less efficient equipment, which would be beneficial to regional GHG emissions. During emergency conditions, the availability of public transportation would reduce the need for less-efficient transportation modes, which could result in reduced GHG emissions during commercial power grid outages, also a beneficial impact of the proposed Project.

Chapter 8 Visual Quality

8.1 INTRODUCTION

This chapter considers the potential for the proposed Project to affect visual quality in the Area of Visual Effect (AVE), by identifying the extent to which the elements of the Build Alternative are visible and evaluating the consistency of the Build Alternative with the existing visual environment.

8.2 REGULATORY CONTEXT AND METHODOLOGY

This analysis has been prepared in accordance with the *U.S. Department of Transportation Guidelines for the Visual Impact Assessment of Highway Projects* (DOT 2015), which represents current best practices for conducting a thorough evaluation of visual impacts caused by a transportation project. The steps in the analysis include:

1. Identify viewsheds in the AVE, defined as what can be seen in the environment in and near the visible project components after consideration of physical constraints and the limits of human perception.
2. Document the visual character in the AVE by describing natural and manmade features and identifying visual resources.
3. Identify the viewer groups whose views would be affected by the Build Alternative.
4. Assess the visual quality in the AVE and establish a set of key views that would serve as the basis for the characterization of visual impacts.
5. Assess the compatibility of the Build Alternative with the visual environment and the viewer sensitivity to changes in the visual character of visual resources to determine the degree of impact.
6. Develop mitigation or visual enhancement measures, if and where warranted.

As part of the Historic Architectural Resources Background Study and Effects Assessment (HARBS)/EA that was prepared for the proposed Project, a detailed viewshed analysis was conducted to account for potential visual and/or contextual effects (see Appendix C, “Historic Resources”) (RGA 2017). In order to delineate the study area for the viewshed analysis, three techniques were employed: electronic viewshed mapping, computer-generated simulations of new monopoles, and stationary field reconnaissance from specific viewpoints. The AVE is based upon this viewshed analysis. The AVE for the proposed Project is shown on Figures 8-1 and 8-2. The viewshed analysis considered the project components that have the potential to affect visual quality of the localized and surrounding area. As a result, the AVE extends the farthest in the vicinity of Preferred Alternative Project Components C, D (including optional routing for Project Component D), and part of Preferred Alternative Project Component E, where monopoles up to

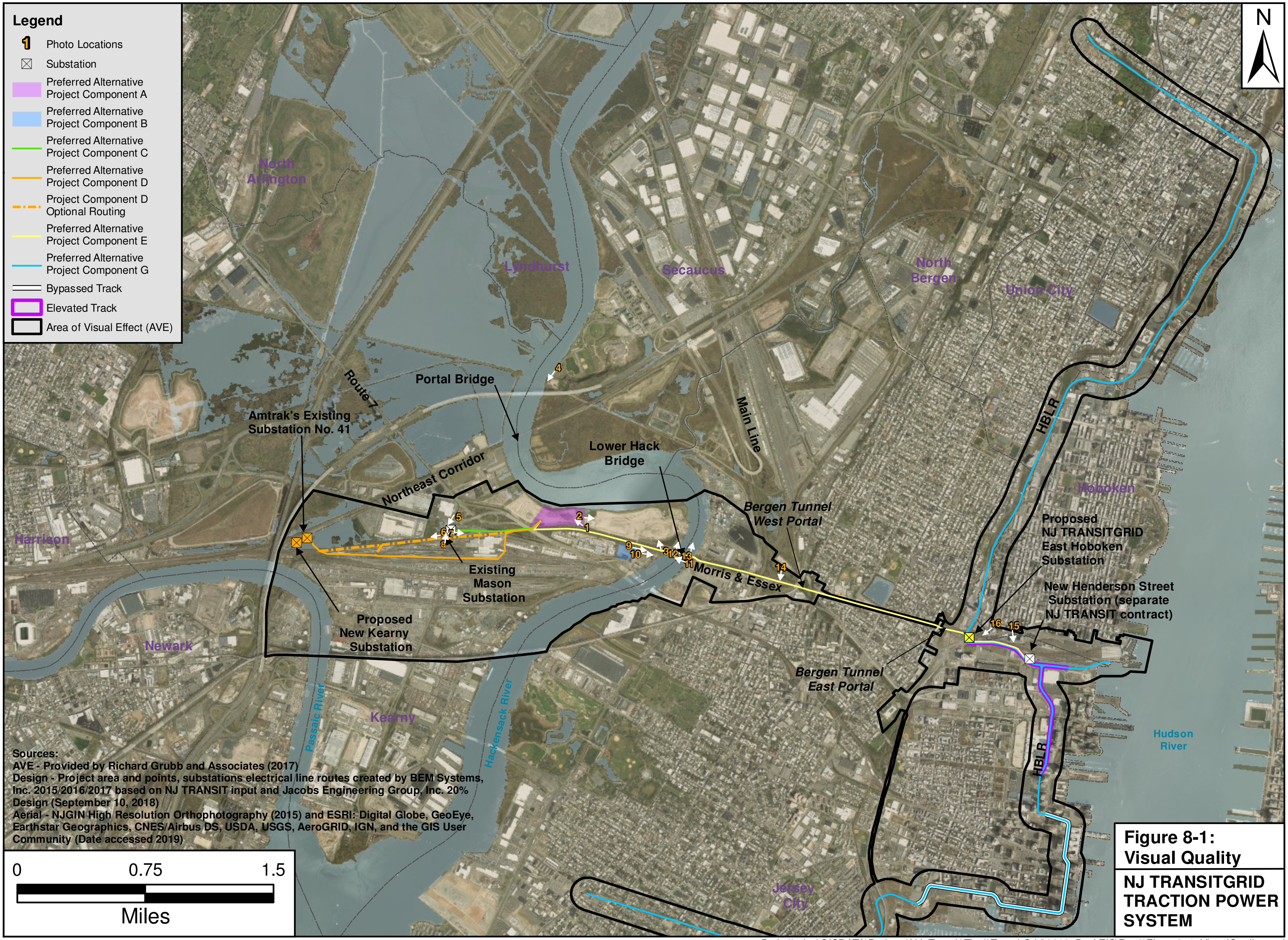

Figure 8-1: Visual Quality

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure8_1_VisualQuality.mxd

Figure 8-2: Visual Quality

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure8_1_VisualQuality.mxd

220 feet in height are proposed. The remainder of Preferred Alternative Project Component E and all of Preferred Alternative Project Components F and G, involve the construction of elements that would be lower in height (e.g., 65-foot-tall monopoles and 39-foot utility poles). Therefore, the AVE for Preferred Alternative Project Components A, B, F, G and part of Preferred Alternative Project Component E are smaller than the AVE for the other components.

8.3 AFFECTED ENVIRONMENT

The AVE for the Preferred Alternative Project Components A through G is described below.

8.3.1 Project Components A and B

Preferred Alternative Project Components A and B and the larger Koppers Koke Site are located in a highly urbanized, industrial area that is characterized by relatively flat terrain and bordered by the Hackensack River (refer to the HARBS/EA in Appendix C for additional photos). The visual landscape is dominated by elevated highways and bridges (including the New Jersey Turnpike, Pulaski Skyway, and Wittpenn Bridge), railroad infrastructure (including the Northeast Corridor, the Morris & Essex Line, and the Montclair-Boonton Line), electrical lines, warehouses, and industrial buildings (see Photos 1 and 2). Much of the existing infrastructure in this portion of the AVE exceeds 150 feet in height. The lift towers on the existing Wittpenn Bridge are approximately 160 feet tall, and numerous utility monopoles, lattice towers, and cell phone monopoles and towers are in excess of 200 feet tall. As observed in the AVE in Industrial Kearny, lattice towers carry about 6 to 8 lines per tower, other utility poles carry 1 to 3 lines per tower, catenary poles on the Morris & Essex Line corridor in Kearny carry up to 20 suspended lines. The potential proposed range is 6 to 14 utility lines. However, the number of lines will be determined on actual final pole placement and connectivity.

Visual resources near Preferred Alternative Project Components A and B include the Hackensack River and several roadway and railroad bridges. The view corridor along the Hackensack River includes adjacent wetlands that are a part of the ecologically sensitive Meadowlands District, the Koppers Koke Site, and other industrial waterfront properties. Roadway and railroad bridges traversing the Hackensack River in the area include: the Lower Hack Draw Bridge, the Wittpenn Bridge, the Pennsylvania Railroad Harsimus Branch (Conrail/CSX) Bridge, and the Pennsylvania Railroad (PATH) Bridge. These four bridges are historic resources and together form the National Register of Historic Places (NRHP) eligible Hackensack River Lift Bridges Historic District (see Chapter 9, “Historic Resources”). The only landside viewsheds to the Hackensack River are from a limited portion of Route 7 and other nearby industrial properties. Despite the proximity of Route 7 and Fish House Road to the Hackensack River, views of the proposed locations of Preferred Alternative Project Components A and B and the Hackensack River are limited due to low roadway elevations, the presence of large industrial buildings, and intervening roadside vegetation. Motorists crossing the Wittpenn Bridge (Route 7) have brief and partially obscured views of the Hackensack River view corridor, due to the truss framework of the bridge itself, and a distant view of Preferred Alternative Project Component A. The new Wittpenn Bridge is currently under construction and will accommodate bicycle and pedestrian traffic and introduce new viewers to the study area (NJDOT 2016). NJ TRANSIT passengers on the Morris & Essex Line have intermittent and brief opportunities to view the Hackensack River, as well as the proposed locations of Preferred Alternative Project Components A and B (see Photo 3). Amtrak and NJ TRANSIT passengers on the Northeast Corridor have distant views of Preferred Alternative Project Component A; Preferred Alternative Project Component B would not be visible to these travelers due to its distance from the railroad.

In general, the landside viewer groups of the existing Preferred Alternative Project Components A and B sites are limited to motorists on Route 7 and workers at the industrial properties in and around the Koppers Koke Site. Viewer sensitivity of workers is considered low since employees are presumed to be engaged with business activities. Viewer sensitivity of motorists (and passengers on railroads) is also considered low because the high rates of speed preclude fixed views of their surroundings. Viewer sensitivity of bicyclists and pedestrians is considered high, although as explained above, bicyclists and pedestrians crossing the Wittpenn Bridge (Route 7) would have brief and partially obscured views of the Hackensack River view corridor, due to the truss framework of the bridge itself, and a distant view of Preferred Alternative Project Component A.

The only waterside viewshed to Preferred Alternative Project Components A and B and the Hackensack River is from the Hackensack River itself. Landside green spaces such as the Riverbend Wetland Preserve (which is outside of the AVE) are not publicly accessible and while Laurel Hill Park (also outside of the AVE) fronts the eastern shore of the Hackensack River in Secaucus, there is no view from the park to the site of Preferred Alternative Project Component A, due to the bend in the river and the intervening bridges (see Photo 4). Therefore, boaters comprise the only viewer group in the waterside viewshed. Boaters, including kayakers and small pleasure craft operators, travel along this segment of the Hackensack River. Hudson County offers free public boat launches and the Hackensack Riverkeeper (a nonprofit advocacy group whose mission is to represent the natural living resources of the Hackensack River) maintains a paddling and boating center within Laurel Hill Park that provides seasonal weekend canoe and kayak rentals. While boaters constitute a viewer group that is seasonal and relatively few in number, viewer sensitivity is considered high, especially for recreational boaters who spend longer periods out on the water.

8.3.2 Project Components C and D

The AVE associated with Preferred Alternative Project Components C and D is an industrial landscape with warehouse/industrial buildings, trailer/container storage, and limited vegetation. Existing lattice towers, monopoles, and cell phone towers (several in excess of 200 feet tall), along with elevated highways and bridges, are visible from most locations within the study area (see Photos 5 through 8). Existing towers and rail infrastructure currently carry a range of 1 to 20 suspended lines in the AVE of Project Components C and D. The potential proposed range is 6 to 14 utility lines. However, the number of lines will be determined on actual final pole placement and connectivity.

Visual resources within this portion of the study area include the Hackensack and Passaic Rivers and the Pulaski Skyway. Several historic railroad bridges that cross the Hackensack River (discussed above) are also visible from portions of the study area. From some vantage points, these visual resources are visible to workers at industrial properties in the study area; travelers on the Morris & Essex Line, PATH, and the Northeast Corridor; motorists on the New Jersey Turnpike, Pulaski Skyway, and local access roads; and boaters and small pleasure craft operators on the rivers. As stated above, viewer sensitivity of workers is considered low since employees are presumed to be engaged with business activities; viewer sensitivity of motorists (and travelers on railroads) is considered low because the high rates of roadway speed preclude fixed views of their surroundings and conversely viewer sensitivity of boaters is considered high.

8.3.3 Project Component E

The electrical line route for Preferred Alternative Project Component E extends east from the Main Facility, over the Hackensack River, and along the Morris & Essex Line to Henderson Street Substation. The Kearny portion of the AVE is an industrial landscape with warehouses and industrial buildings, tall lattice towers, monopoles, cell phone towers, and elevated highways and bridges (see Photos 9 and 10). Visual resources in the western portion of the AVE include the Hackensack River and several bridges. Views of the electrical line route are available to travelers on the Morris & Essex Line, workers in the industrial areas, motorists on local roadways, and boaters on the Hackensack River. The towers of the Lower Hack Bridge currently support several visible electrical lines (see Photos 11,12 and 13). Existing monopoles and lattice towers run parallel to the rail corridor just to the south as observed in Photo 11 where they carry up to 16 lines and up to 16 lines/electrical wires are also visible on the Lower Hack Bridge to commuting rail passengers. Lattice towers with up to 8 lines are also visible to passengers with a view point to the north. The potential proposed range is 6 to 14 utility lines. However, the number of lines will be determined on actual final pole placement and connectivity.

An existing power generation facility (with smokestacks approximately 499 feet tall) is located on the eastern shore of the Hackensack River (see Photo 13). The electrical line route continues east through an industrial section of Jersey City that sits along the bank of the Hackensack River and passes Saint Peter's Cemetery to an intersection with John F. Kennedy Boulevard (see Photo 14; refer to the HARBS in Appendix C for additional photos).

A substantial portion of the Preferred Alternative Project Component E electrical line route lies within NJ TRANSIT's existing Bergen Tunnels. East of the tunnel portal in Jersey City, the route traverses a small segment of a high-density mixed-use neighborhood with commercial, institutional, and residential uses in the route to Hoboken Yard (see Photos 15 and 16). There are no visual resources or view corridors in the eastern portion of the route. Views of the electrical line route are available to travelers on the Morris & Essex Line and area workers and residents in the western portion of the AVE. Viewer sensitivity of workers is considered low since employees are presumed to be engaged with business activities. Viewer sensitivity of motorists (and travelers on railroads) is also considered low because the high rates of speed preclude fixed views of their surroundings. As explained earlier, viewer sensitivity for boaters is considered high, especially for recreational boaters who spend longer periods out on the water. Residents are considered to be sensitive viewers as they would have views of longer duration.

8.3.4 Project Component F

The Preferred Alternative Project Component F consists of electrical power connectivity to the southern portions of HBLR by construction of a small "nanogrid" (or two emergency standby generators) on NJ TRANSIT-owned property at the HBLR Headquarters facility. A small portion of the HBLR Headquarters property is visible from nearby residential apartment buildings (see Photos 17 through 19). Primary viewer groups within the study area include train passengers, and workers, both of which have low viewer sensitivity. Residents within the AVE would be considered sensitive viewers as they would have views of longer duration. Existing utility poles and rail infrastructure currently carry a range of 10 to 12 suspended lines in the AVE of Project Component F. The potential proposed range is 6 to 14 utility lines. However, the number of lines will be determined on actual final pole placement and connectivity.

8.3.5 Project Component G

Preferred Alternative Project Component G is located in a highly urbanized industrial area that is characterized by relatively flat terrain located west of the Hudson River. Existing overhead electrical lines on utility poles are visible from most locations within the study area. Overall, the visual character of the study area is dominated by transportation use, specifically railroads. The HBLR alignment travels through a mix of residential, commercial, and industrial areas. Visual resources in the study area include the Hudson River and several parks, such as Liberty State Park. Views of the New York City skyline are available from locations along the Hudson River and from Liberty State Park. Viewer groups within the study area include residents, workers, motorists, travelers on railroads, and park visitors. Residents and park visitors are considered to be sensitive viewers as they would have views of longer duration. Viewer sensitivity of workers is considered low since employees are presumed to be engaged with business activities. Viewer sensitivity of motorists (and travelers on railroads) is also considered low because the high rates of speed preclude fixed views of their surroundings. Along the Project Component G corridor existing towers carry 1 to 6 lines and rail infrastructure/ poles currently carry a range of 2 to 4 suspended lines in the AVE of Project Component G. The potential proposed range 6 to 14 utility lines. However, the number of lines will be determined on actual final pole placement and connectivity.

8.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

8.4.1 No Action Alternative

Under the No Action Alternative, the project components 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 Non-Project planned and programmed transportation improvements for which commitment and financing have been identified would be implemented by 2021. These include projects in NJ TRANSIT's Resilience Program and Amtrak initiatives that will affect operations on the Northeast Corridor. Planned re-development projects within the Redevelopment Area (described in Chapter 3, "Land Use, Zoning, and Public Policy") include warehouse facilities, which would modestly change the visual landscapes of the Kearny peninsula, as they would introduce new structures adjacent to the Hackensack River.

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 that carry electrical lines to Substation No. 41 will be replaced with one monopole. Under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel on the Koppers Koke property as well as the adjacent six-acre parcel as part of a property settlement as described in Chapter 2. Under the No Action Alternative, the 20 acres that

NJ TRANSIT is acquiring would likely be used for ancillary railroad purposes. Overall, no impact to visual quality is expected under the No Action Alternative.

8.4.2 Build Alternative

Project Component A

Preferred Alternative Project Component A would introduce new infrastructure (the Main Facility) adjacent to the Hackensack River. It would be built on a vacant brownfields property and would be contextual with the surrounding industrial nature of the Kearny peninsula. Motorists on Route 7 and workers at adjacent properties within the Redevelopment Area would have views of the Main Facility. As explained above, these viewer groups have low sensitivity to changes in the visual environment. Bicyclists and pedestrians crossing the Wittpenn Bridge would have distant and partially obscured views of Preferred Alternative Project Component A. Preferred Alternative Project Component A may be briefly visible to rail passengers along the Morris & Essex Line and more distantly visible to Amtrak and NJ TRANSIT passengers along the Northeast Corridor. While Preferred Alternative Project Component A would be visible from certain limited locations, it would not block any important views within the Hackensack River viewshed. Boaters on the Hackensack River may be able to view elements of Preferred Alternative Project Component A; however, the site has been elevated and the existing bulkhead would continue to be the most prominent visual element. The proposed improvements would be in context with the industrial landscape, the existing and planned warehouses and industrial buildings, and the railroad and utility infrastructure elements. As a result of these considerations, Preferred Alternative Project Component A is not expected to result in significant visual impacts.

Project Component B

Project Component B involves construction of an underground gas pipeline (to fuel the proposed microgrid) and a gas metering station enclosed in a small structure, security fencing, and other security improvements. Due to the limited nature of these improvements, construction of Project Component B would not block views within the Hackensack River viewshed and would not result in significant visual impacts.

Project Components C and D

As discussed in Chapter 2, "Project Alternatives," this DEIS evaluated three design options for Project Components C and D (see Photo 20): 1) all electrical lines installed overhead on monopoles (up to 220 feet); 2) all electrical lines installed underground in duct banks; and 3) a combination of using overhead (monopoles) and underground (duct banks) options. The third alternative 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. As explained above, the current visual landscape includes numerous utility monopoles, lattice towers, and cell phone towers in excess of 200 feet tall. The new monopoles would be in context with the existing industrial character of the AVE. Travelers on the area's public transportation, motorists on the area's roadways, workers at nearby industrial properties, and boaters on the Passaic and Hackensack Rivers would have views of the new electrical lines. However, the new monopoles would not obscure any view corridors nor would they block any views of visual resources. The introduction of the new visual elements would not be considered an adverse visual effect due to the prevalence of similar infrastructure in the industrial area of Kearny.

Views of Cedar Creek Marsh South are extremely limited due to its location between the Northeast Corridor and the Morris & Essex Line. The replacement of Amtrak's Substation No. 41 with the new Kearny Substation and any new monopoles would not represent a substantial change from the existing infrastructure and would not impact visual quality in this area.

Overall, the proposed monopoles are expected to be compatible with the visual character of the AVE. Where the electrical lines are installed in underground duct banks, there would be no adverse visual impacts. As a result, Preferred Alternative Project Components C and D, and the optional routing for Project Component D, are not expected to result in significant visual impacts.

Project Component E

The preferred design option for electrical lines for Preferred Alternative Project Component E from the Main Facility to the Hackensack River would be a combination of using overhead monopoles (up to 220 feet tall) and underground duct banks. The new monopoles would be in context with the existing industrial character of the study area and the scale of the existing transmission lines, monopoles, lattice towers, and cell phone towers. Options for crossing the Hackensack River include a submarine cable laid on the river bottom, a directional drilled cable below the river bottom, or an aerial crossing approximately 50 feet north of the Lower Hack Bridge. While the first two options would be primarily below grade, structures would be required on either side of the Hackensack River for the transition from monopoles to underground electrical lines. These structures would be visible to travelers on the Morris & Essex Line, workers in the industrial areas, motorists on local roadways, and boaters on the Hackensack River. The third option, which is the preferred option, would involve the installation of new poles up to 220 feet, one on either side of the river. The proposed poles and electrical lines over the Hackensack River would be similar in character to existing lattice towers and overhead electrical lines that are located just north of the bridge. These improvements would not block any views of the river or bridge. At the Bergen Tunnels, the electrical line would travel through the south tunnel in a duct bank and would not be visible.

The above-ground portions of Preferred Alternative Project Component E would be visible to motorists on study area roadways, rail passengers, workers and residents in the vicinity, boaters on the Hackensack River, and pedestrians and bicyclists on the Wittpenn Bridge. Proposed monopoles east of the Hackensack River would be no more than 65 feet tall; the change in visual quality resulting from their construction would not be significant since the new monopoles would be similar in scale and character to existing infrastructure prevalent throughout the study area. The new NJ TRANSITGRID East Hoboken Substation would be located in an isolated parcel, owned by NJ TRANSIT, between the existing railroad and roadways. While the new NJ TRANSITGRID East Hoboken Substation would be visible from certain locations, it would be consistent with the surrounding visual character. Where the electrical lines are installed in underground duct banks, they would not be visible and therefore would not result in adverse visual impacts. Overall, Project Component E is expected to be compatible with the visual character of the AVE and would not result in significant adverse visual impacts.

Project Component F

At the HBLR Headquarters property, which is the proposed location of the nanogrid for electric power connectivity to the southern portions of HBLR (Preferred Alternative Project Component F), the surrounding areas are highly developed urban areas. This portion of the study area includes rail line, warehouses and other industrial infrastructure. The maximum height of the equipment installed for the nanogrid would be 25 feet above the ground surface. Much of the existing infrastructure in this portion of the AVE exceeds 25 feet in height. The nanogrid would be smaller in scale and similar in character to existing infrastructure in the study area. As a result, Project Component F is not expected to result in significant visual impacts.

Project Component G

Utility work included in Preferred Alternative Project Component G would be entirely within the existing HBLR right-of-way. The preferred design option will consist of a combination of new utility poles (up to 39 feet tall), underground duct banks and attachment to existing HBLR structures. The aboveground electrical lines would be visible to residents, workers, and motorists on local roadways, as well as rail passengers and park visitors. The proposed 39-foot-tall monopoles would not block views to any visual resources or change the visual quality since the new monopoles would be located in an existing transportation right-of-way and would be similar in scale and appearance to existing poles and overhead electrical lines prevalent throughout the study area. Overall, the proposed monopoles are expected to be compatible with the visual character of the study area. Where the electrical lines are installed via underground duct banks or attached to existing HBLR structures, the electrical lines would not be visible and therefore would not impact visual resources. As a result, Project Component G is not expected to result in significant visual impacts.

8.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The Main Facility and natural gas pipeline connection will be constructed in an existing industrial area. The new substations and the nanogrid would be consistent with surrounding visual character. Under the preferred design option for the electrical lines (i.e., a combination of monopoles, duct banks and attachment to existing NJ TRANSIT owned structures [HBLR]), where the electrical lines are installed on monopoles, the new monopoles will be designed to complement the existing visual character in the various project areas. Where electrical lines are installed in underground duct banks, or attached to existing infrastructure, there would be no impact to visual resources. While the design option for all electrical lines to be installed in underground duct banks would have no impact to visual resources, this option is not feasible 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.

No significant adverse impacts on visual quality or visual resources would be expected to result from implementation of the Build Alternative and the preferred design option for electrical lines. Therefore, no mitigation is required for the Build Alternative and preferred design option for electrical line installation.

Chapter 8: Visual Quality Photos

Project Components A and B

Photo 1: View west towards the New Jersey Turnpike and the Hackensack River from the Koppers Koke Site, photo taken within proposed Project Component A footprint. While the physical terrain is relatively flat, the visual landscape from this vantage point is dominated by the elevated highway, tall utility poles, and railroad infrastructure.

Photo 2: View east toward existing utility infrastructure and industrial development from the Koppers Koke Site, photo taken within proposed Project Component A footprint.

Photo 3: View north towards proposed Project Component A of the Koppers Koke Site and the Hackensack River from the Morris & Essex Line. The proposed locations of Project Components A and B are visible from the Morris & Essex Line.

Photo 4: View southwest toward the Hackensack River and the New Jersey Turnpike from Laurel Hill Park in Secaucus. Project Component A is not visible from Laurel Hill Park due to the bend in the Hackensack River and the New Jersey Turnpike Bridge. Therefore, boaters comprise the only viewer group in the waterside viewshed.

Project Components C and D

Photo 5: View southwest toward the Morris & Essex Line from the Mason Substation in proposed Project Components C and D. Tall utility towers are visible from the Morris & Essex Line.

Photo 6: View southwest toward the Morris & Essex Line from Mason Substation of proposed Project Component C. Tall monopoles, lattice towers, and electrical wires are visible adjacent to the railroad right-of-way.

Photo 7: View east toward the Morris & Essex Line from the Mason Substation within proposed Project Component D. Tall utility poles, lattice towers, and electrical lines are visible from the railroad right-of-way.

Photo 8: View north toward Mason Substation and existing utility infrastructure from the Morris & Essex Line.

Project Component E

Photo 9: View east towards the Lower Hack Bridge and the Morris & Essex Line from an access road. Tall monopoles, lattice towers, and electrical lines exist adjacent to the railroad right-of-way within proposed Project Component E.

Photo 10: View east towards the Lower Hack Bridge and existing utility infrastructure from the access road. Utility infrastructure can be seen by travelers on the Morris & Essex Line, workers in industrial areas, motorists on local roadways, and boaters on the Hackensack River.

Photo 11: View up close of the electrical wires attached to the Lower Hack Bridge, which are visible to passengers traveling on the Morris & Essex Line.

Photo 12: View north toward the Hackensack River from the Morris & Essex Line on the Lower Hack Bridge. Electrical wires attached to the Lower Hack Bridge are visible to railroad passengers. Tall electrical infrastructure is also visible in the distance from this perspective.

Photo 13: View north toward the Hackensack River and an existing power generation facility from the Morris & Essex Line. The far-right smokestack is approximately 499 feet tall. In addition, several tall lattice towers and utility poles are visible to railroad passengers on the Morris & Essex Line.

Photo 14: View southeast toward the proposed Project Component E electrical line from the Saint Peter's Cemetery in Jersey City.

Photo 15: View southeast toward the Morris & Essex Line's approach to Hoboken Yard from the 700 Grove Street Condos. The Morris & Essex Line and electrical infrastructure are visible from this mixed-use neighborhood.

Photo 16: View southwest toward the Morris & Essex Line's approach to Hoboken Yard from the 700 Grove Street Condos. The Morris & Essex Line and electrical infrastructure are visible from this mixed-use neighborhood.

Project Component F

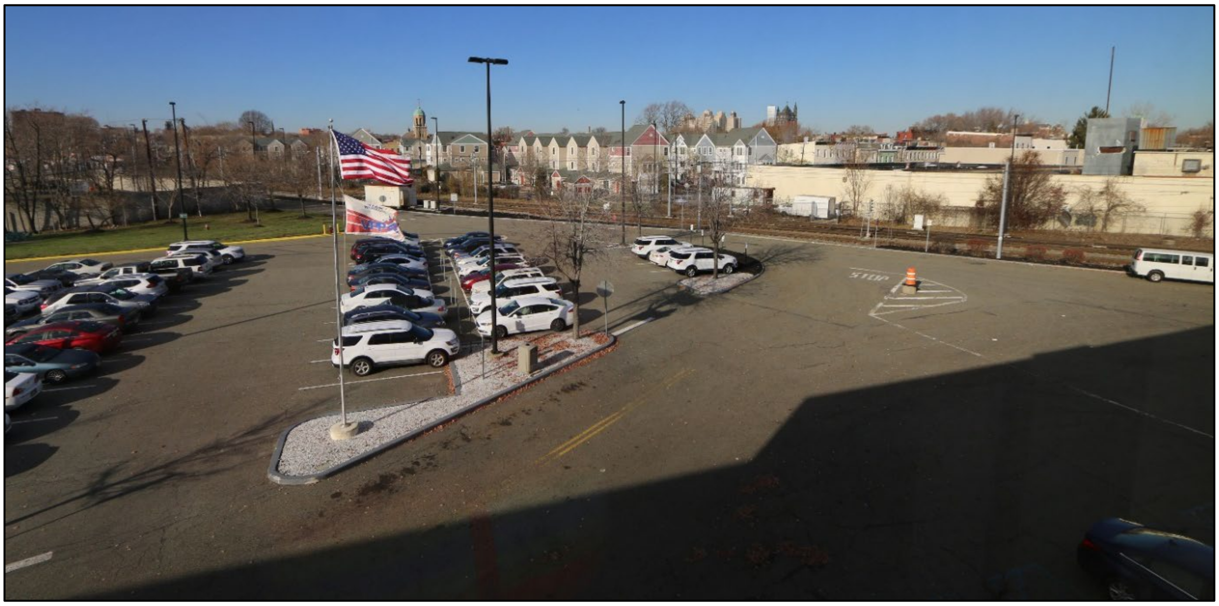

Photo 17: View from HBLR Headquarters building facing north. Residential apartments are visible past the HBLR rail line.

Photo 18: View of the NJ TRANSIT-owned property between the HBLR Headquarters building (on right side of photo) and maintenance areas within the facility.

Photo 19: Another view of NJ TRANSIT-owned HBLR Headquarters facility storage areas. HBLR line splits in this area, line to West Side Avenue station is on left side of photo and line to Bayonne is on right side of photo.

Build Alternative, Project Component C&D, E

Photo 20: Rendering of proposed monopoles west of the Hackensack River.

Chapter 9 Historic Resources

9.1 INTRODUCTION

This chapter evaluates the potential for the No Action and Build Alternative to affect historic resources, including historic architectural and archaeological resources. This chapter summarizes the findings of the Historic Architectural Resource Background Study (HARBS) and Effects Assessment (EA) Report (RGA 2017a), the Supplemental Information for the HARBS and EA Report (RGA 2017b), the Phase 1A Archaeological Survey (RGA 2017c), and the Supplemental Information for the Phase IA Survey (RGA 2017d) that were prepared for the proposed Project and are included in Appendix C, "Historic Resources." This chapter focuses on the potential for the Build Alternative to impact historic resources.

9.2 REGULATORY CONTEXT AND METHODOLOGY

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as implemented by federal regulations appearing in 36 CFR Part 800, mandates that federal agencies consider the effect of their actions on any properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. The Section 106 review process requires consultation with the New Jersey Historic Preservation Office (NJHPO) in order for FTA to determine whether a project may directly or indirectly alter characteristics of a historic property that qualifies it for inclusion in the NRHP, which would constitute an "adverse effect." Agency and public input are essential to inform federal decision-making in the Section 106 process, and the public and agency participation efforts that have been conducted for this Project are described in Chapter 21, "Agency Coordination and Public Participation." Correspondence documenting the Section 106 consultation process is included in Appendix C, "Historic Resources."

The analysis for historic resources was conducted following the Section 106 consultation process and includes the following steps:

- Delineate the Area of Potential Effects (APE)- above ground (architectural resources) and APE-below ground (archaeological resources) in consultation with the NJHPO via a Section 106 Project Initiation Letter; identify consulting and interested parties; and conduct agency and public outreach;

- Prepare a HARBS/EA that complies with Section 106 and NJHPO's current guidelines for historic architectural surveys, which includes identification of known resources, surveys of resources that are potentially eligible for listing in the NRHP, and an effects assessment for the historic resources that are eligible for or listed in the NRHP and are within the APE-above ground;

- Prepare a Phase IA archaeological survey for the APE-below ground that complies with Section 106 and NJHPO's requirements to assess the potential for significant archaeological resources to be encountered during construction of the Build Alternative, which would determine the need for a Phase IB survey. A Phase IB survey entails shovel tests, soil borings and analysis, and/or determination of a need for archaeological monitoring during construction;
- Consult with the NJHPO and FTA-approved consulting parties, which includes submitting the HARBS/EA report and Phase IA archaeological survey to NJHPO and consulting parties for review, submitting the Supplemental Information for the HARBS/EA report and Supplemental Information for the Phase IA archaeological survey to NJHPO for review, and concurrence on the findings; and
- As warranted, negotiate and execute a Section 106 agreement between NJHPO, FTA and NJ TRANSIT. The NJHPO made a determination of an adverse effect. At FTA's direction a Programmatic Agreement (PA) will be executed to define the measures to be undertaken to avoid, minimize, and/or mitigate the adverse effects of the proposed Project on historic resources.

9.2.1 Definition of APE

As defined under Section 106, the APE is: "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE for the proposed Project includes locations that may potentially be impacted by construction, or that may experience effects once construction is completed. The APE-below ground includes all locations of potential ground disturbance for construction of all project components. To account for potential contextual (visual) effects, the APE-above ground extends beyond the actual construction limits of the proposed Project to include those properties that may be impacted by visual changes, patterns of use, or may experience a change in historic character associated with the construction of the proposed improvements.

The Final Scoping Document for the proposed Project, dated May 2016, outlined a foundation for initiating Section 106 consultation. It stated that the APE-above ground would likely be an area within 1,000 feet or less from new construction, while the APE-below ground would likely be limited to areas directly impacted by construction activity. In coordination with FTA and NJHPO, the project team used electronic viewshed mapping, computer-generated simulations of new poles, and field reconnaissance to refine and delineate a more precise APE-above ground. Based on the anticipated project viewshed, this effort produced a preliminary APE-above ground of 1,000 feet from the proposed Project. In a few areas, the APE-above ground was extended up to 1,650 feet from Preferred Alternative Project Components C, D, and E in the industrial areas of Kearny and Jersey City to fully encompass entire tax parcels or to compensate for open areas of high visibility. NJ TRANSIT submitted this preliminary APE-above ground to the NJHPO and FTA for approval. In a letter dated March 30, 2016, the NJHPO concurred with the APE-above ground as delineated. FTA concurred with the APE-above ground on May 20, 2016.

Following the approval of the APE-above ground, the project design continued to evolve and several changes in project elements warranted revisions to the APE-above ground. The APE-above ground in Kearny was expanded upon determination of a maximum 220-foot height for the proposed new monopoles. A previously proposed electrical line route through an abandoned Conrail-owned tunnel and along Hoboken Avenue was relocated, and the APE-above ground was adjusted accordingly. Similarly, the APE-above ground was extended south of Hoboken Avenue to include the project components along the New Jersey Turnpike right-of-way. As discussed in more detail below, project components along the New Jersey Turnpike right-of-way are no longer proposed.

The HARBS and EA Report (RGA 2017a), the Supplemental Information for the HARBS and EA Report (RGA 2017b), the Phase 1A Archaeological Survey (RGA 2017c), and the Supplemental Information for the Phase IA Survey (RGA 2017d), undertook analyses of the for the effect of the Build Alternative on historic resources within the APE-above ground and APE-below ground. After the completion of these reports, the portion of the project along the New Jersey Turnpike right-of-way and the NJ TRANSIT easement in northern Jersey City (identified as Project Component F – Section 1 in Supplemental Information for the Phase IA Survey [RGA 2017d]) was eliminated as a potential project alternative. The boundaries of the APE for historic resources represented in figures in this section continue to include the New Jersey Turnpike right-of-way and NJ TRANSIT easement, due to the previous NJHPO concurrence of the APE, as described above. The descriptions of Project Components and analyses of archaeological sensitivity and recommendations for archaeological work, however, reflect the current design plans.

To account for the inclusion of the new electrical line along the HBLR corridor, NJ TRANSIT developed an additional APE-above ground for Preferred Alternative Project Component G in coordination with FTA and NJHPO. Due to the nature of the undertaking, the surrounding environment, and the limited height of the proposed poles, the APE-above ground for Project Component G was limited to an area within 500 feet from the proposed electrical line alignment. Electronic viewshed mapping and field reconnaissance were employed as tools to guide which buildings within the APE-above ground warranted survey based on potential visual effects. Utilizing ArcGIS 3D analyst software, Digital Elevation Models (DEM) were used to create viewshed mapping for the area within the 1,000-foot-wide corridor based on the maximum pole height of approximately 39 feet for any new poles. Field reconnaissance was conducted on January 26 and 27, 2017 to assess existing conditions and to check sightlines from various vantage points along the HBLR corridor between the Township of North Bergen and the City of Bayonne. The preliminary APE-above ground for Project Component G was submitted to the NJHPO for approval by NJ TRANSIT on February 8, 2017. On February 28, 2017, the NJHPO requested revisions to clarify the extent of the APE-above ground along the HBLR corridor. NJ TRANSIT submitted a revised APE-above ground for Preferred Alternative Project Component G for approval on March 7, 2017. On March 15, 2017, the NJHPO concurred with the revised APE-above ground for Preferred Alternative Project Component G. FTA concurred with the APE-above ground for HBLR on June 15, 2017. The APE is presented on Figures 9-1 and 9-2.

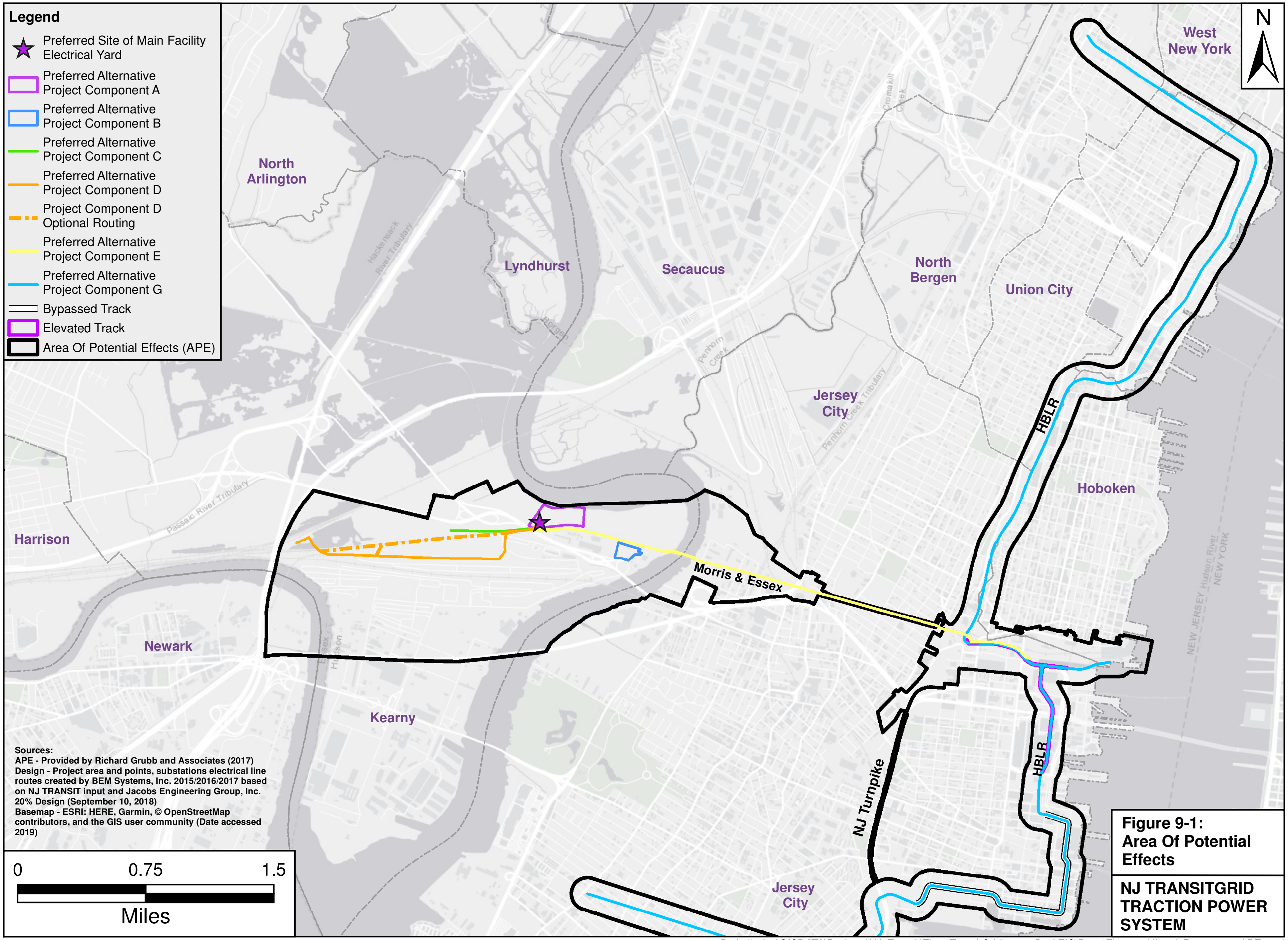

Figure 9-1: Area Of Potential Effects

NJ TRANSITGRID TRACTION POWER SYSTEM

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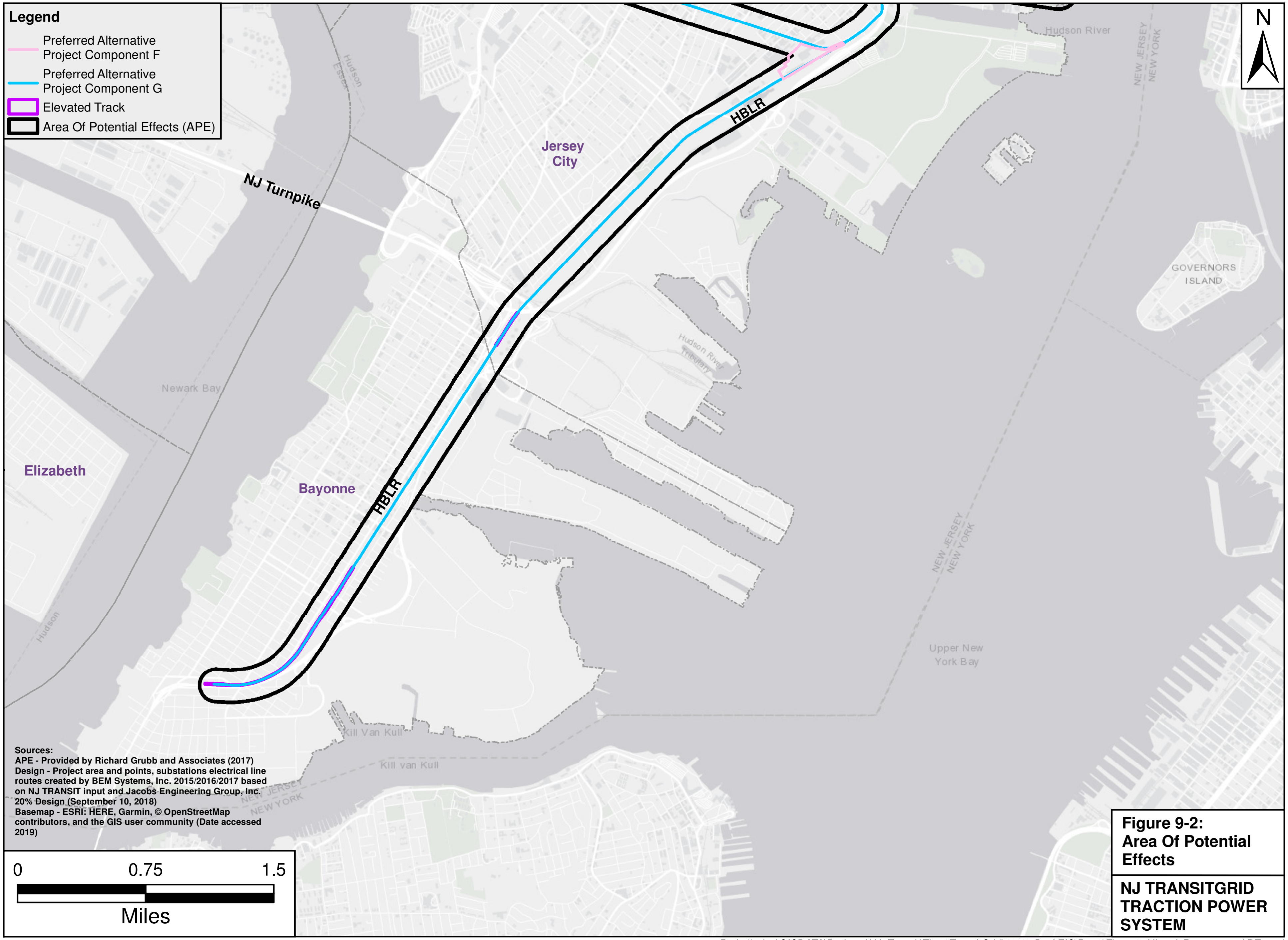

Figure 9-2: Area Of Potential Effects

NJ TRANSITGRID TRACTION POWER SYSTEM

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9.2.2 National Register Criteria

The National Register defines four specific criteria for evaluation of historic resources (NPS 2016). These criteria are:

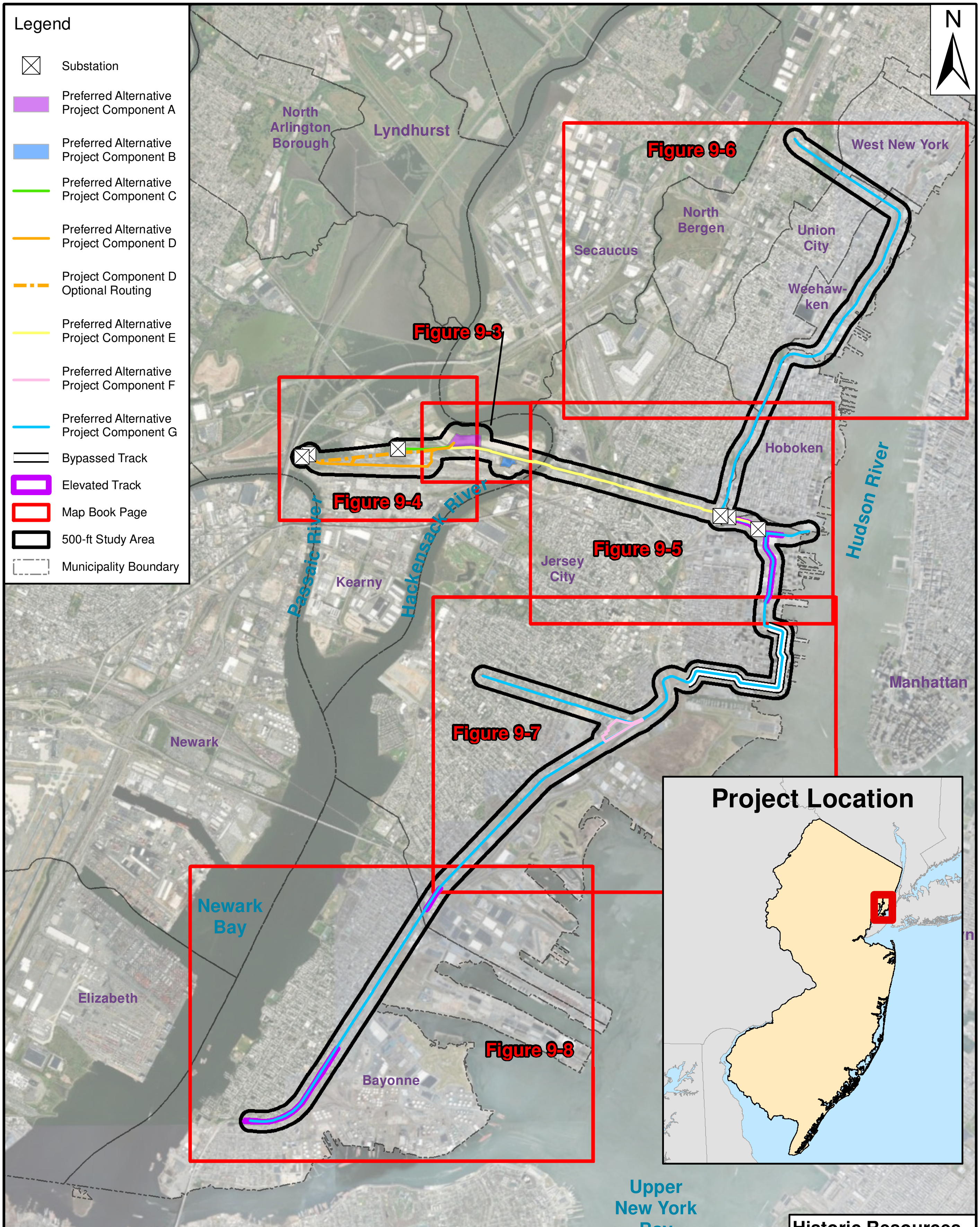
- Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: Associated with the lives of significant persons in our past; or
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: Yielded or may be likely to yield, information important in history or prehistory.

9.3 AFFECTED ENVIRONMENT

The Phase IA and HARBS/EA reports identified 80 historic resources within the APE-above ground and APE-below ground listed in or eligible for listing in the NRHP (see Table 9-1 and Figures 9-3 through 9-8) for the Build Alternative. Of the 80 identified historic resources, 78 are historic architectural resources, of which 25 are historic districts, two are historic streetscapes, and 51 are historic properties. The identified historic resources within the APE-above ground and APE-below ground for the Build Alternative are discussed below.

9.3.1 Historic Architectural Resources

The majority of resources within the APE-above ground are located outside of the construction footprint of the Build Alternative. Table 9-1 lists all historic architectural resources within the APE-above ground that are NRHP-listed or that have been evaluated as being eligible for the NRHP by the NJHPO or the HARBS completed in connection with the proposed Project. This list includes both resources that may be indirectly or directly affected by the project. Only the historic resources that may be directly affected by the undertaking and those that are likely to be adversely affected by contextual impacts are described below.



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)

Historic Resources Key Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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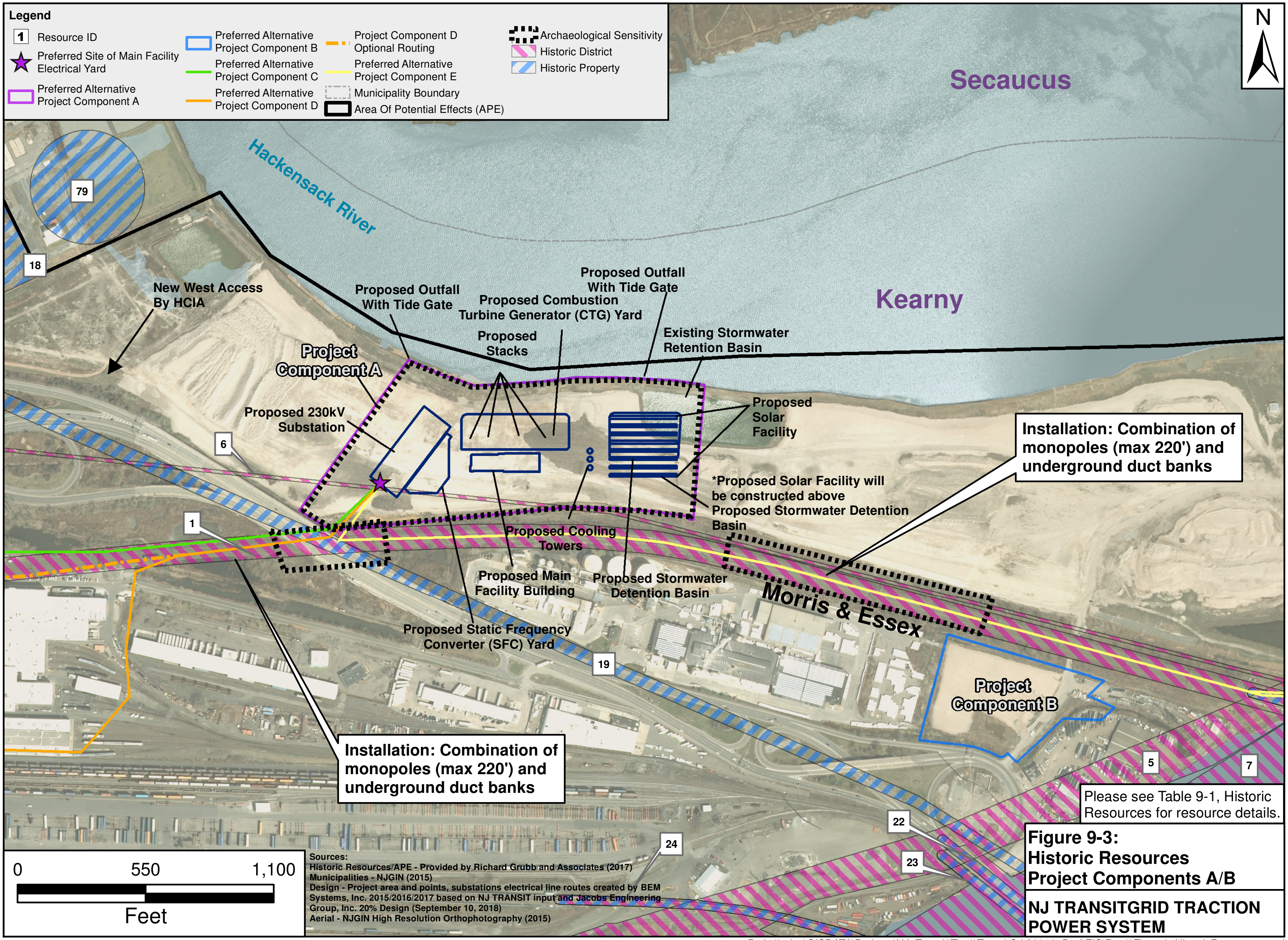

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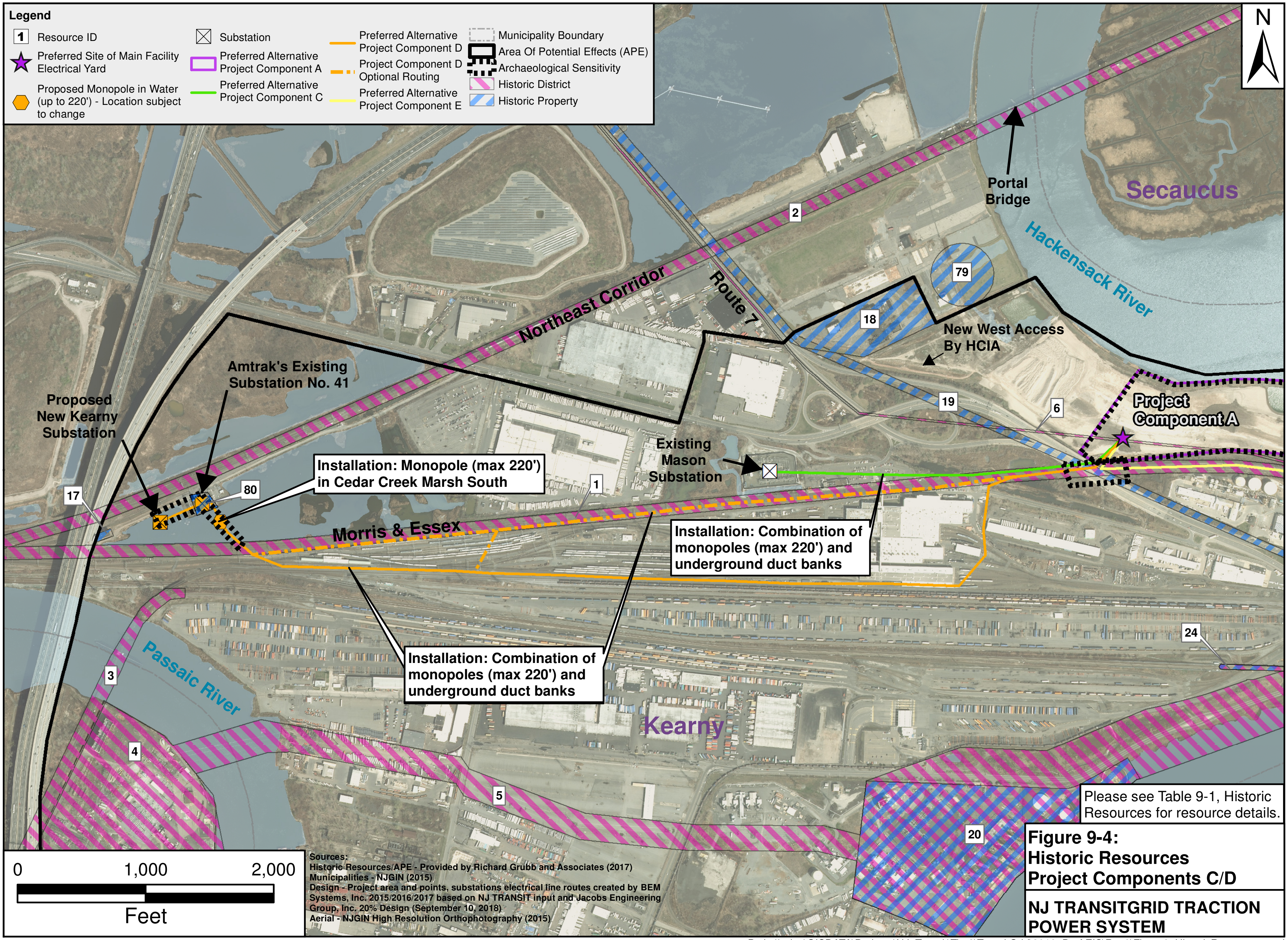

Figure 9-4: Historic Resources Project Components C/D

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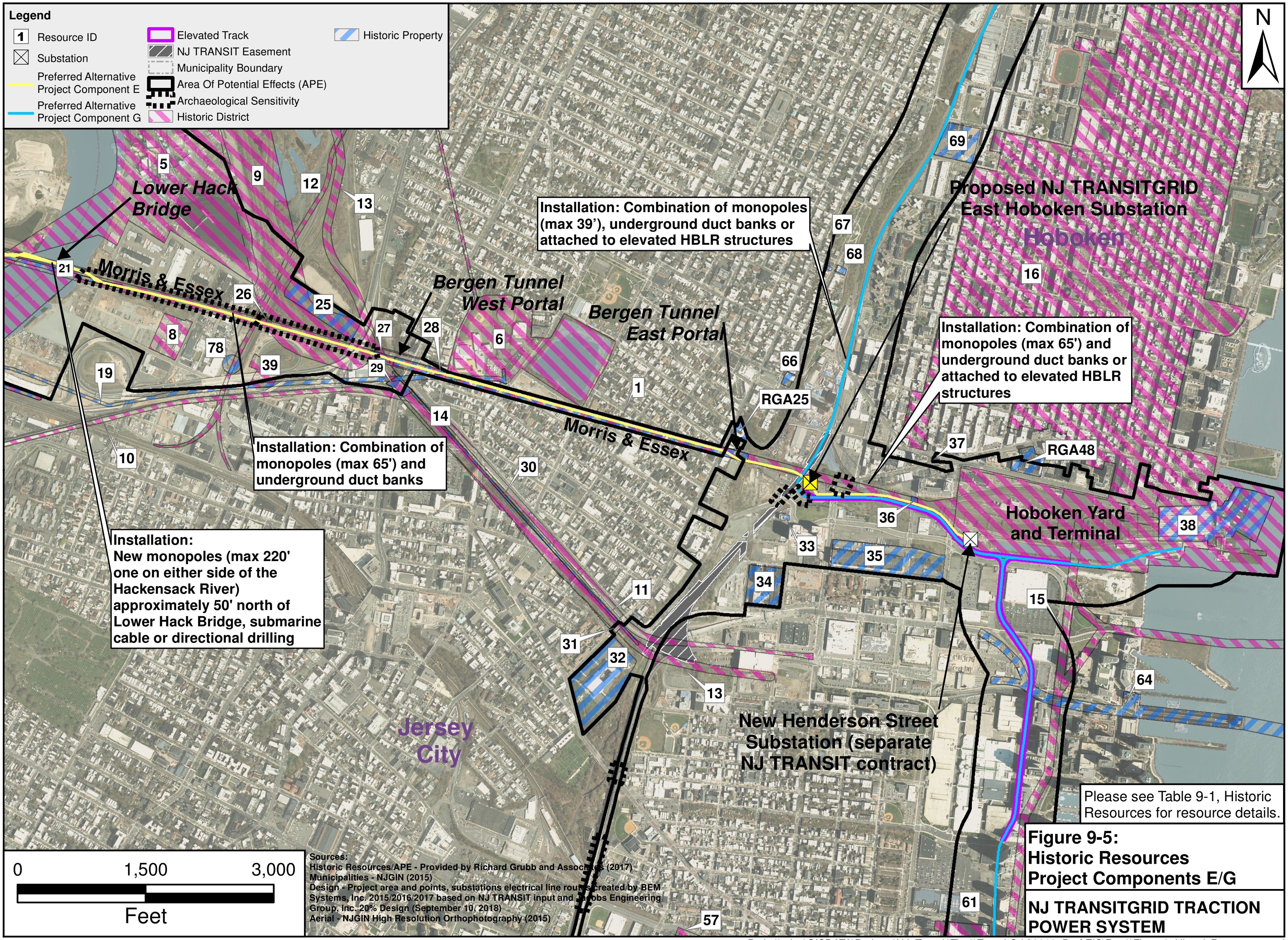

Figure 9-5:
Historic Resources
Project Components E/G

NJ TRANSITGRID TRACTION POWER SYSTEM

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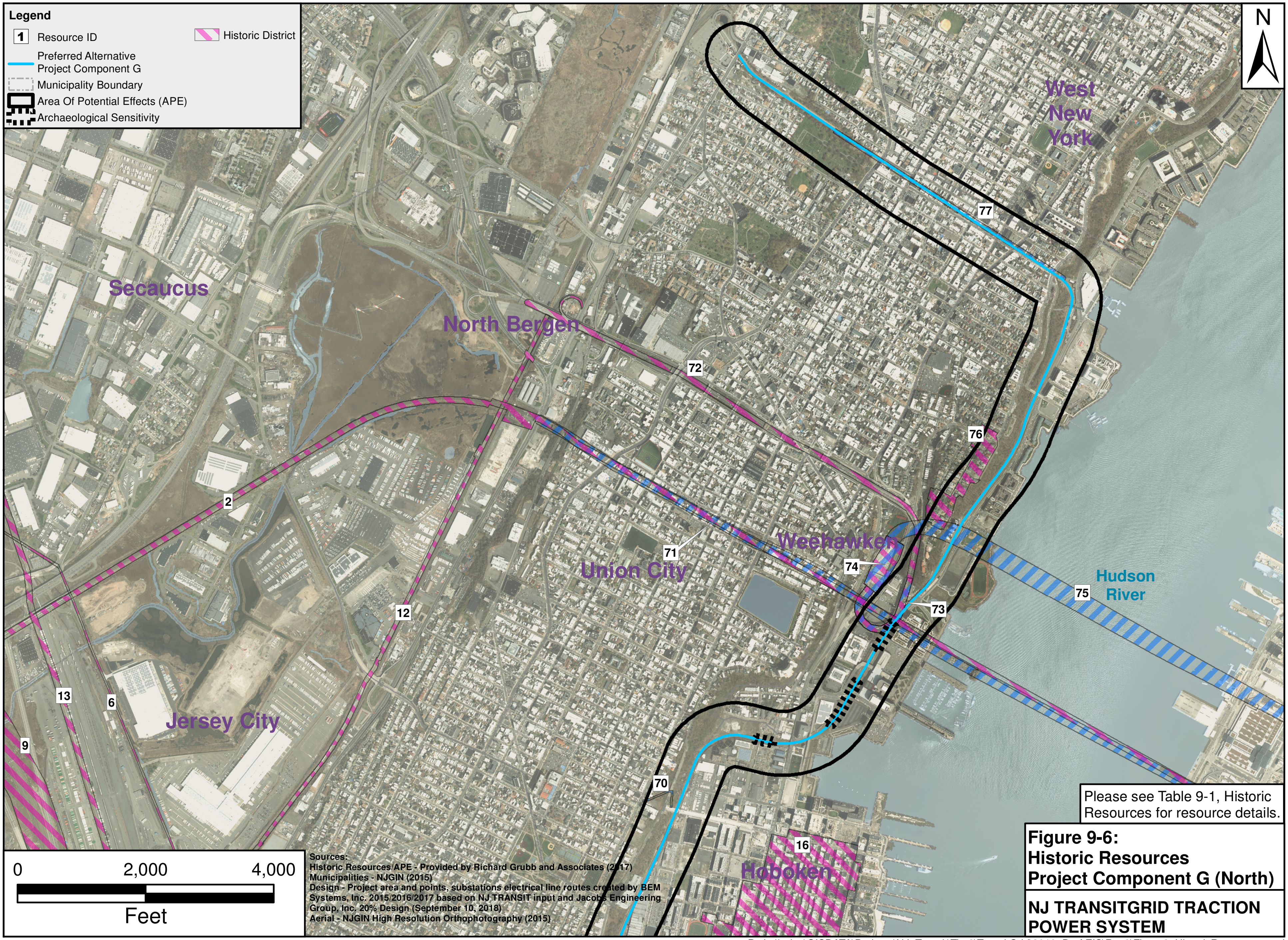

Figure 9-6: Historic Resources Project Component G (North)

NJ TRANSITGRID TRACTION POWER SYSTEM

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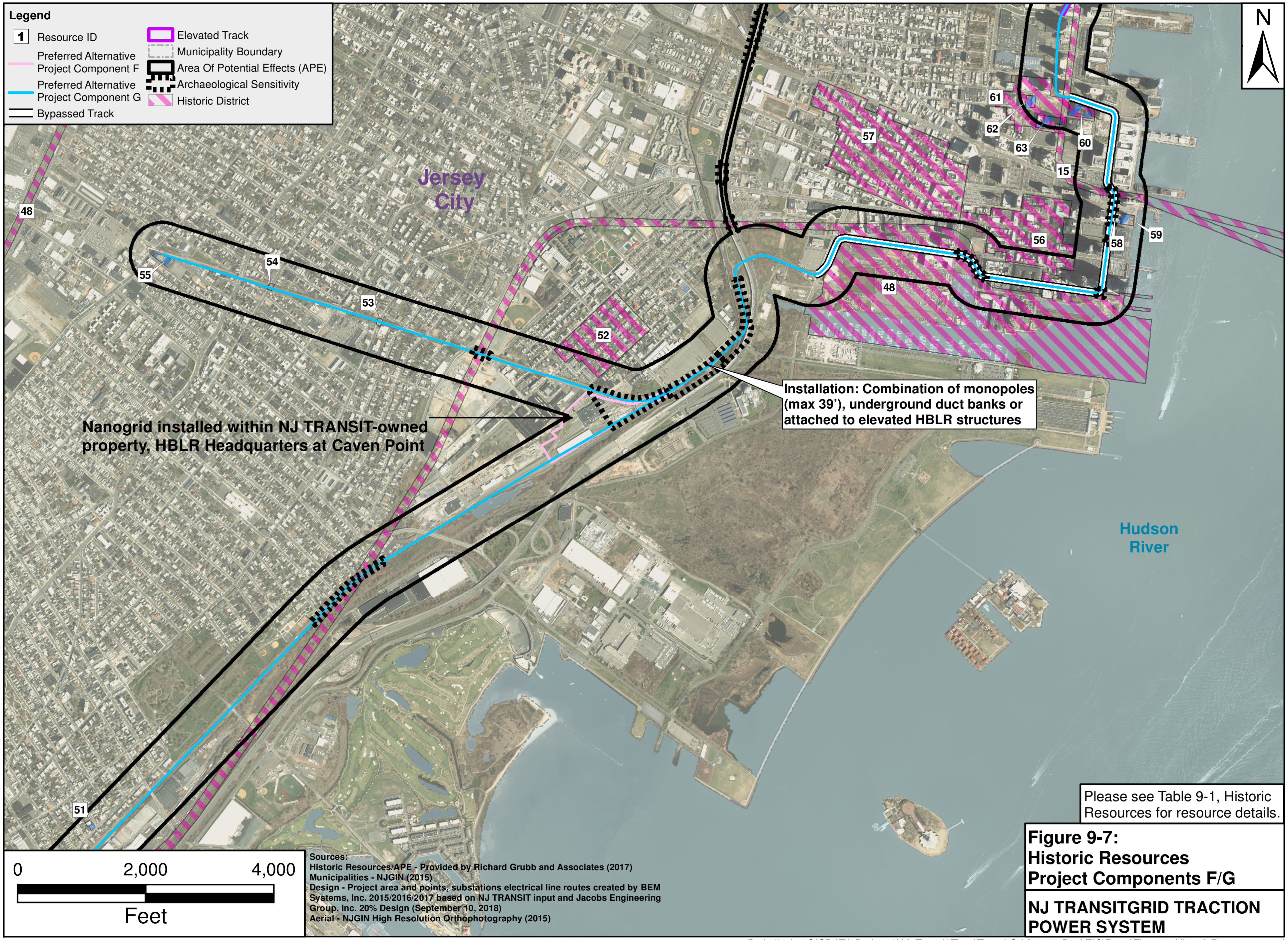

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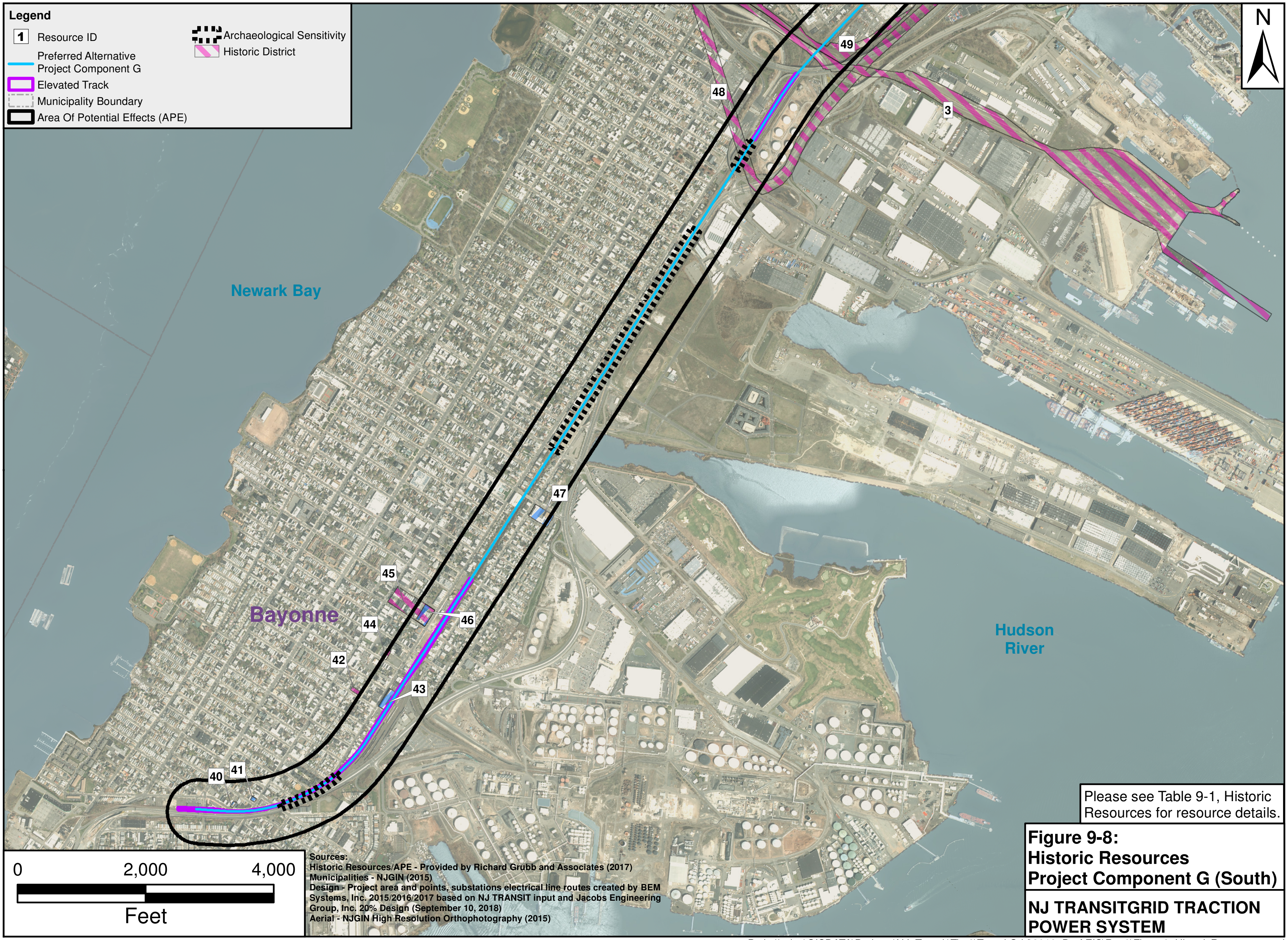

Figure 9-8: Historic Resources Project Component G (South)

NJ TRANSITGRID TRACTION POWER SYSTEM

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Table 9-1 Eligible and Listed Historic Resources*

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
1	Old Main Delaware, Lackawanna and Western Railroad Historic District	Multiple	Eligible (NJHPO Opinion: 9/24/1996)	Adverse effect	Fig. 9-3, 9-4, 9-5
2	Pennsylvania Railroad New York to Philadelphia Historic District	Multiple	Eligible (NJHPO Opinion: 10/2/2002)	No adverse effect	Fig. 9-4, 9-6
3	Pennsylvania Railroad New York Bay Branch Historic District	City of Newark	Eligible (NJHPO Opinion: 4/22/2005)	No adverse effect	Fig. 9-4
4	Essex Generating Station	Town of Kearny; City of Newark	Eligible (NJHPO Opinion: 3/23/2015)	No adverse effect	Fig. 9-4
5	PSE&G Kearny-Essex-Marion Interconnection Historic District	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 12/31/2013)	No adverse effect	Fig. 9-3, 9-4, 9-5
6	Jersey City Water Works Historic District	Multiple	Eligible (NJHPO Opinion: 1/20/2003)	No effect provided direct project impacts avoided	Fig.9-3, 9-4, 9-5, 9-6
7	Hackensack River Lift Bridges Historic District	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 5/3/2002)	Adverse effect	Fig. 9-3, 9-5
8	People's Gas Light Company/PSE&G Marion Office Historic District	City of Jersey City	Eligible (NJHPO Opinion: 3/10/1999)	No adverse effect	Fig. 9-5
9	Delaware, Lackawanna and Western Railroad Boonton Line Historic District	Multiple	Eligible (NJHPO Opinion: 9/18/2008)	Adverse effect	Fig. 9-5, 9-6
10	US Route 1 Extension [Pulaski Skyway] Historic District	Multiple	Listed (NJR: 6/13/2005; NRHP: 8/12/2005)	No adverse effect	Fig. 9-5
11	US Routes 1&9 Historic District	Multiple	Eligible (NJHPO Opinion: 3/8/1996)	No adverse effect	Fig. 9-5

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
12	New Jersey Midland Railway/New York, Susquehanna and Western Railroad Historic District	Multiple	Eligible (NJHPO Opinion: 4/25/2006 & 1/30/2015)	No adverse effect	Fig. 9-5, 9-6
13	Erie Railroad Main Line Historic District	Multiple	Eligible (NJHPO Opinion: 2/20/2003)	No adverse effect	Fig. 9-5, 9-6
14	Erie Railroad Bergen Archways Historic District	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
15	Hudson and Manhattan Railroad Transit System (PATH) Historic District	Multiple	Eligible (NJHPO Opinion: 3/4/2002)	No adverse effect	Fig. 9-5, 9-7
16	Hoboken Historic District	City of Hoboken	Eligible (NJHPO Opinion: 12/12/2016)	No adverse effect	Fig. 9-5, 9-6
17	Substation 4	Town of Kearny	Eligible (NJHPO Opinion: 9/12/1994)	No adverse effect	Fig. 9-4
18	Edison Battery Company Property	Town of Kearny	Eligible (NJHPO Opinion: 4/8/2008)	No adverse effect	Fig. 9-3, 9-4
19	Jersey City Water Works Pipeline	City of Jersey City	Eligible (NJHPO Opinion: 5/7/1999)	No effect provided direct project impacts avoided	Fig. 9-3, 9-4, 9-5
20	PSE&G Kearny Generating Station	Town of Kearny	Eligible (NJHPO Opinion: 5/3/2002)	No adverse effect	Fig. 9-4
21	Lower Hack Draw Bridge	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 9/18/1996)	Adverse effect	Fig. 9-5
22	Wittpenn Bridge [SI&A #0909150]	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 2/7/2001)	No adverse effect	Fig. 9-3
23	Pennsylvania Railroad Harsimus Branch (Conrail/CSX) Bridge over the Hackensack River	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 5/3/2002)	No adverse effect	Fig. 9-3

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
24	Pennsylvania Railroad (PATH) Bridge over Hackensack River	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 5/3/2002)	No adverse effect	Fig. 9-3, 9-4
25	St. Peter's Cemetery	City of Jersey City	Eligible (NJHPO Opinion: 6/18/1996)	No adverse effect provided direct project impacts avoided	Fig. 9-5
26	West End Interlocking Tower	City of Jersey City	Eligible (NJHPO Opinion: 1/20/1999)	Adverse effect	Fig. 9-5
27	West-End Through Truss Bridges	City of Jersey City	Eligible (NJHPO Opinion: 3/31/1997)	Adverse effect	Fig. 9-5
28	Old and New Bergen Tunnels	City of Jersey City	Eligible (NJHPO Opinion: 5/8/1998)	Adverse effect	Fig. 9-5
29	JFK Boulevard Bridge [SI&A # 0951170]	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
30	Erie Railroad Bergen Hill Tunnel [aka Long Dock Tunnel]	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
31	Palisade Avenue Bridge [SI&A # 0951165]	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
32	Jersey City High School [William Dickinson High School]	City of Jersey City	Listed (NJR: 12/23/1981; NRHP: 6/1/1982)	No adverse effect	Fig. 9-5
33	Holbrook Manufacturing Company	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5
34	Continental Can Company Complex	City of Jersey City	Eligible (NJHPO Opinion: 5/30/1997)	No adverse effect	Fig. 9-5
35	Lackawanna Warehouse and Viaduct	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-5
36	Grove Street Bridge	City of Jersey City	Eligible (NJHPO Opinion: 1/20/1999)	No adverse effect	Fig. 9-5
37	Engine Company #3, Truck #2 Firehouse	City of Jersey City	Listed (NJR: 2/9/1984; NRHP: 3/30/1984)	No adverse effect	Fig. 9-5
38	Erie-Lackawanna Terminal	City of Hoboken	Listed (NJR: 12/7/2004; NRHP: 2/17/2005)	No adverse effect	Fig. 9-5

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
39	Covert/Larch Historic District	City of Jersey City	Eligible (NJHPO Opinion: 3/10/1999)	No effect provided direct project impacts avoided	Fig. 9-5
40	Mechanic's Trust Company	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
41	Bayonne Trust Company	City of Bayonne	Listed (NJR: 4/20/2006; NRHP: 8/8/2006)	No adverse effect	Fig. 9-8
42	East 17th Street Apartment Buildings Streetscape	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
43	Maidenform Brassiere Company	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
44	East 19th Street Streetscape	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
45	Mount Carmel Historic District	City of Bayonne	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-8
46	YMCA of Bayonne	City of Bayonne	Eligible (NJHPO Opinion: 5/5/1997)	No adverse effect	Fig. 9-8
47	Public School Number 5	City of Bayonne	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-8
48	Morris Canal	Multiple	Listed (NJR: 11/26/1973; NRHP: 10/1/1974)	No effect provided direct project impacts avoided	Fig 9-7, 9-8
49	Lehigh Valley Railroad Historic District	Multiple	Eligible (NJHPO Opinion: 3/15/2002)	No adverse effect	Fig. 9-8
51	Hanover National Bank Repository	City of Jersey City	Eligible (COE: 5/18/2006)	No adverse effect	Fig. 9-7
52	Communipaw-Lafayette Historic District	City of Jersey City	Eligible (NJHPO Opinion: 2/17/1995)	No adverse effect	Fig. 9-7
53	Ocean Avenue Bridge (SI&A #0950163)	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-7
54	Bergen Avenue Bridge (SI&A #0900011)	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-7
55	Former Candy Factory	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-7
56	Paulus Hook Historic District	City of Jersey City	Listed (NJR: 8/7/1981; NRHP: 6/21/1982)	No adverse effect	Fig. 9-7

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
57	Van Vorst Park Historic District	City of Jersey City	Listed (NJR: 8/21/1984; NRHP: 10/11/1984)	No adverse effect	Fig. 9-5, 9-7
58	One Exchange Place (Bank Building)	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-7
59	Commercial Trust Company Bank	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-7
60	Hudson and Manhattan Railroad Powerhouse	City of Jersey City	Listed (COE: 10/7/1999; NRHP: 11/23/2001)	No adverse effect	Fig. 9-7
61	Warehouse Historic District	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5, 9-7
62	Great Atlantic and Pacific Tea Company Warehouse	City of Jersey City	Listed (NJR: 6/2/1978; NRHP: 6/2/1978; NHL 6/2/1978)	No adverse effect	Fig. 9-7
63	Butler Brothers Warehouse	City of Jersey City	Listed (NJR: 10/26/2015)	No adverse effect	Fig. 9-7
64	Holland Tunnel	City of Jersey City	Listed (NJR: 10/13/1995; NRHP: 11/4/1993; NHL 11/3/1993)	No effect provided direct project impacts avoided	Fig. 9-5
66	Pohlmann's Hall	City of Jersey City	Listed (NJR: 7/5/1985; NRHP: 9/5/1985)	No adverse effect	Fig. 9-5
67	269-271 Ogden Avenue	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5
68	268-272 Ogden Avenue	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5
69	Ferguson Brothers Manufacturing Company	City of Hoboken	Eligible (NJHPO Opinion: 10/16/1998)	No adverse effect	Fig. 9-5
70	Old Hillside Road Trolley Horseshoe Curve	Multiple	Eligible (NJHPO Opinion: 5/21/1999)	No adverse effect	Fig. 9-6
71	North (Hudson) River Tunnels	Multiple	Eligible (NJHPO Opinion: 11/12/1998)	No adverse effect	Fig. 9-6
72	NJ Route 3 (NJ 495) Highway Approach to Lincoln Tunnel Historic District	Weehawken Township	Eligible (NJHPO Opinion: 11/17/1999)	No adverse effect	Fig. 9-6
73	NJ Route 495 Viaduct (SI&A 3800031)	Weehawken Township	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-6

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
74	Lincoln Tunnel Entrance and Ventilation Buildings	Weehawken Township	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-6
75	Lincoln Tunnel	Weehawken Township	Eligible (NJHPO Opinion: 2/25/2003)	No adverse effect	Fig. 9-6
76	King's Bluff Historic District	Weehawken Township	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-6
77	West Shore Railroad Tunnel	Multiple	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-6
78	New York, Susquehanna and Western Railroad Engine Repair Site (28-Hd-48)	City of Jersey City	Eligible (NJHPO Opinion: 1/30/2015)	No effect provided direct project impacts avoided	Fig, 9-5
79	Standard Chlorine Chemical Company Site (28-Hd-44)	Town of Kearny	Eligible (NJHPO Opinion: 5/22/2012)	No effect provided direct project impacts avoided	Fig. 9-3, 9-4
80	Substation No. 41	Town of Kearny	Eligible (NJHPO Opinion: 4/24/2018)	No effect	Fig. 9-4
RGA25	Belvedere Court	City of Jersey City	Eligible (NJHPO Opinion: 4/24/2018)	No adverse effect	Fi. 9-5
RGA48	R. Neumann & Co. Factory Complex	City of Hoboken	Eligible (NJHPO Opinion: 12/9/2016)	No adverse effect	Fig. 9-5

*Resource ID numbers based on HARBS numbering; additional, sequential resource ID numbers 78, 79, and 80 given to resources which were not part of the HARBS. Resource ID numbers 39, 78, and 79 are archaeological resources, and Resource ID 80 was identified by the NJHPO in their review letter dated April 24, 2018 (HPO-D2018-122 PROD). Resource ID 65, L.O. Koven & Brothers Sheet Iron and Plate Steel Works, was identified by NJHPO as no longer eligible for the NRHP in their review letter dated April 24, 2018 (HPO-D2018-122 PROD). Resource ID 50, Pennsylvania Railroad New York Bay Branch Historic District, was a duplicate of Resource ID 3.

Old Main Delaware, Lackawanna, and Western Railroad Historic District (Morris & Essex Line)

The Old Main Delaware, Lackawanna and Western Railroad (DL&W) Railroad Historic District (Resource ID 1) 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 property 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. Multiple contributing resources are located within the APE-above ground.

Other contributing components of the Old Main DL&W Railroad Historic District include the Old and New Bergen Tunnels (through which Preferred Alternative Project Component E would extend) as well as bridges and other structures. Tunnels, bridges, and other structures that are within the Old Main DL&W Railroad Historic District that are individually eligible for or listed in the NRHP and would be potentially directly affected by the proposed Project are described in detail below.

Hackensack River Lift Bridges Historic District

The Hackensack River Lift Bridges Historic District (Resource ID 7) includes four individually eligible bridges: Lower Hack Draw Bridge, 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. Of the four individually eligible bridges, the Lower Hack Draw Bridge is also a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District. 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.

Lower Hack Draw Bridge

The Lower Hack Draw Bridge (Resource ID 21) 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. In January of 1999, the Lower Hack Draw Bridge was determined individually eligible for listing in the NRHP under Criteria A and C; however, the SHPO Opinion of Eligibility did not specify under which areas of significance the resource is eligible. The bridge is also a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District and the NRHP-eligible Hackensack River Lift Bridges Historic District.

West End Interlocking Tower

The West End Interlocking Tower (Resource ID 26), located along Preferred Alternative Project Component E, 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 West End Interlocking Tower is a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District.

West-End Through Truss Bridges

Built in 1908 for the DL&W Railroad, the steel West-End Through Truss Bridges (Resource ID 27), part of Preferred Alternative Project Component E, at milepost 1.89 on the Morris & Essex Line carry two rail lines at the West End of the Bergen Tunnel. The bridges span the former Erie Railroad tracks that emerge from the adjacent Erie Tunnel under Bergen Hill. The West-End Through Truss Bridges are the only trusses surviving on this particular rail 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 West-End Through Truss Bridges are contributing resources to the NRHP-eligible Old Main DL&W Railroad Historic District.

Old and New Bergen Tunnels

The Old and New Bergen Tunnels (Resource ID 28), part of Preferred Alternative Project Component E, are parallel tunnels that cut through the trap rock of Bergen Hill and each carry two rail lines. Built in 1876 by the DL&W Railroad, the Old Bergen Tunnel measures 4,278 feet in length, 27 feet in width, and 19 feet in height. The New Bergen Tunnel was built in 1908 and measures 4,281 feet in length, 30 feet in width, and 23 feet in height. 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 tunnels are contributing resources to the NRHP-eligible Old Main DL&W Railroad Historic District.

Delaware, Lackawanna and Western Railroad Boonton Line Historic District

The Delaware, Lackawanna & Western Railroad (DL&W) Railroad Boonton Branch Historic District (a.k.a. NJ TRANSIT Main Line; Resource ID 9) is eligible for listing in the New Jersey Register of Historic Places (NJR) and 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 (Saunders 2008). The DL&W Railroad leased the Morris & Essex Railroad (M&ERR) in 1868, then constructed and opened the so-called Boonton Cut-off in 1869-1870 to channel coal and freight traffic off the old M&ERR 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 M&ERR main line. The resource is distinguished from, but connected to, the NRHP-eligible Old Main DL&W Railroad Historic District.

9.3.2 Archaeological Resources

There are several below-ground resources eligible for listing in the NRHP located within and in close proximity to the APE-below ground. Some of these resources, such as the Jersey City Water Works Historic District, are historic architectural resources that were designed to be constructed below-ground. All historic resources located below ground are included within the Phase 1A Archaeological Survey (RGA 2017c) and the Supplemental Information for the Phase IA Survey (RGA 2017d), and are discussed along with the other archaeological resources.

The Jersey City Water Works Pipeline and Historic District

The Jersey City Water Works Historic District (Resource ID 6), part of Preferred Alternative Project Components C and D, was determined eligible for listing in the NRHP under Criteria A, C, and D for its associations with the early twentieth century urban reform movement, its engineering significance, and its potential to yield important historical information on nineteenth-century civil engineering technology and construction. The Jersey City Water Works Pipeline (Resource ID 19) is individually eligible for listing in the NRHP for its potential to yield important information regarding mid-nineteenth century public works engineering and construction. The pipeline consists of a 20-inch pipe built in 1854 and a 36-inch pipe built in 1863 from the Passaic River to Jersey City, both of which are original components of the NRHP-eligible Jersey City Water Works Historic District. The documented location of the Jersey City Water Works Pipeline bisects Project Components C and D where the Morris & Essex Line crosses underneath the Newark-Jersey City Turnpike (Route 7). The Jersey City Water Works Historic District enters Preferred Alternative Project Component A near the Route 7 off-ramp, runs east-southeast toward the Morris & Essex Line, then follows a nearly parallel route along the northern boundary of Preferred Alternative Project Component E to the Jersey City Reservoir 2 and 3 Complex in Jersey City.

St. Peter’s Cemetery

Located in Jersey City adjacent to the west of Route 1&9, St. Peter’s Cemetery (Resource ID 25) is a Roman Catholic burial ground with interments beginning with the cemetery’s creation in 1849. The cemetery has minimal landscaping and is surrounded by a chain link fence. St. Peter's Cemetery was determined eligible for listing in the NRHP at the local level in 1996 under Criterion A as Jersey City's first burial ground dedicated to the Roman Catholic community. St. Peter's Cemetery lies to the north adjacent to Preferred Alternative Project Component E, east of the Lower Hack Draw Bridge.

The Covert/Larch Historic District

Six archaeological sites contribute to the circa nineteenth century Covert/Larch Historic District (Resource ID 39): the Beck/Thorpe/Altvatter House Sites (28-Hd-20), the Gavenesch/Balbo House/Store Site (28-Hd-21), the Gavenesch/D'Amato House/Saloon Site (28-Hd-22), the Gavenesch/Sarno House Site (28-Hd-23), the Radcliffe/Hoersch House Site (28-Hd-24), and the Moore/Bukowski House Site (28-Hd-25). A cultural resources survey completed by the RBA Group in 2000 recommended archaeological data recovery for the six contributing archaeological sites within the Covert/Larch Historic District. The Covert/Larch Historic District was determined eligible for NRHP listing under Criterion D for its potential to yield important information regarding late nineteenth century working class community behaviors. The Covert/Larch Historic District lies to the south adjacent to Preferred Alternative Project Component E, east of the Lower Hack Draw Bridge.

Morris Canal

The Morris Canal (Resource ID 48), which was completed in 1836 after little more than a decade of construction, was listed on the (NJR) and NRHP in the early 1970s as a linear historic district. The period of significance for the Morris Canal begins in 1824, the year the Morris Canal and Banking Company obtained a charter, and ends in 1923, the year ownership of the Morris Canal was transferred to the State of New Jersey from the Lehigh Valley Railroad. The canal is significant under Criterion A for its association with canal transportation, American technical education, and the demographic and industrial growth in northern New Jersey, New York City, and the Lehigh Valley. Because several inventors, engineers, and important men were associated with the construction and operation of the canal, the canal is significant under Criterion B. The Morris Canal meets Criterion C as a major technological feat of construction and operation, including the inclined plane design. As the resource is located entirely below ground in the vicinity of the APE, the project would not result in any visual or contextual effects upon the Morris Canal. Below ground, the resource passes directly beneath the New Jersey Turnpike (formerly part of Project Component F) in one location and under Project Component G in four locations. The below-ground components of the resource contain potential information relating to canal engineering and construction as well as the lifeways of nineteenth-century canal culture.

The New York, Susquehanna, and Western Railroad Engine Repair Site

The NYS&W Railroad Engine Repair Facility and Yard (Resource ID 78) is documented on maps dating between the early 1880s and 1913 at the northeast corner of St. Paul's Avenue and West Side Avenue south the of the Old Main DL&W Railroad Historic District. Structural remains of the engine repair building and the southern perimeter of the turntable were identified and registered as New York Susquehanna and Western RR Engine Repair Site (28-Hd-48), and recommended NRHP eligible. The NYS&W Railroad

Engine Repair Site lies south of Preferred Alternative Project Component E, east of the Lower Hack Draw Bridge.

The Standard Chlorine Chemical Company Site

The Standard Chlorine Chemical Company (SCCC) Site (Resource ID 79) (28-Hd-44) is an intact and deeply buried prehistoric archaeological site bordered by the Hackensack River to the east, the Northeast Corridor to the north, Route 7 to the west and the Koppers Koke Site to the south. The site was identified during construction of a slurry wall between nine and 17 feet below ground surface on a former well-drained sandy upland that was buried by sea level inundation. A peat layer overlying the sandy upland was radiocarbon dated to AD 1160 to AD 1260. It was determined eligible for NRHP listing under Criterion D for its potential to add important information on Woodland Period Native American exploitation of the Hackensack River drainage. The sandy upland is hypothesized to represent a stable Early to Middle Holocene floodplain with potential to contain evidence of human occupation through the early Late Holocene. Site 28-Hd-44 lies outside of the APE-below ground to the northwest.

9.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

9.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed. With or without the proposed Project, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke Site as well as the six-acre parcel (Preferred Alternative Project Component B). As explained in Chapter 2, “Project Alternatives”, this acquisition is moving forward as part of a property settlement agreement between NJ TRANSIT and HCIA. Therefore, in the absence of the proposed Project, it is likely these portions of the Koppers Koke Site would be used for ancillary railroad purposes such as storage or parking. Under the No Action Alternative, there would be a missed opportunity to educate commuters about the Historic District through interpretive exhibits and the comprehensive corridor study, as stipulated in the PA, would not be completed.

Several major transportation initiatives for which commitment and financing have been identified would proceed, resulting in various changes to some of the resources described above. NJDOT is currently replacing the Route 7 Wittpenn Bridge (NRHP-eligible) over the Hackensack River, along with its approach ramps. That project is expected to be completed by 2022. Multiple state-of-good-repair projects would continue to be implemented along this segment of the Pennsylvania Railroad New York to Philadelphia Historic District (Northeast Corridor). Some of these projects will add to the extensive alterations of the Historic District since the time that it was determined NRHP-eligible. NJ TRANSIT’s and Amtrak’s Portal Bridge Capacity Enhancement Project, Amtrak’s Sawtooth Bridges Replacement Project, and other projects along the Northeast Corridor in the area would remove or alter features that contribute to the historic character of the Pennsylvania Railroad New York to Philadelphia Historic District. Therefore, under the No Action Alternative, it is likely that the integrity of the Historic District would continue to be diminished, but that the Historic District would remain NRHP-eligible. Additionally, as described in Chapter 2, in the absence of the proposed Project, Amtrak has plans to construct the new Kearny Substation and completely replace and rebuild Substation No. 41 to make it less susceptible to flooding. This effort would include the removal of the existing lattice towers in Cedar Creek Marsh South and the installation of new monopoles.

9.4.2 Build Alternative

The Build Alternative would include the construction of 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), electrical lines and the new Kearny Substation (Preferred Alternative Project Component D), electrical lines and the New NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E), the nanogrid, consisting of emergency generators and energy storage at HBLR Headquarters on Caven Point Avenue (Preferred Alternative Project Component F), and the electrical lines proposed along the HBLR right-of-way (Preferred Alternative Project Component G). The preferred option for installation of electrical lines for Preferred Alternative Project Components C, D, E, and G would include a combination of new monopoles, underground duct banks and attachments to existing infrastructure (i.e., the HBLR elevated tracks).

All scenarios for potential direct and contextual impacts have been explored in detail in the HARBS/EA, Phase IA, and Supplemental reports. Resources with the potential to be directly affected and those that are likely to be adversely affected by contextual impacts are discussed in detail below. The effects on archaeological resources (including below-ground historic architectural resources) and above-ground historic resources presented herein are based on the 20 percent design. With regard to resources where direct project effects are possible but avoidable, this analysis recommends that project elements be designed in a manner that avoids direct impacts to character-defining features of these resources. Avoidance may include placement of monopoles or underground duct banks outside the estimated boundaries of resources and archaeological sensitivity areas, where construction may result in ground disturbance that could potentially damage or destroy elements of the resources, or installation of duct banks where shallow ground disturbance will would preclude disturbance of deeply buried archaeological resources. These conditions would be adhered to as the project engineering progresses, and as a result, the project would not result in adverse effects to these resources.

Archaeological Resources

The Koppers Koke Site where Preferred Alternative Project Component A would be constructed has a high sensitivity for prehistoric archaeological resources based on the presence of a deeply buried Early to Middle Holocene upland landform that contains a documented prehistoric archaeological resource. The limits of the Early to Middle Holocene upland landform are unknown and may extend into the APE-below ground. In addition, portions of the APE-below ground located within 500 feet of a perennial water source, on terrain documented historically as uplands and where limited ground disturbance has occurred have high sensitivity for prehistoric archaeological resources. Extensive areas of filled marshland are located within the APE-below ground. Installation of pile-driven foundations would have no adverse effect on the SCCC Site or undocumented prehistoric or historic archaeological resources, if any, within the APE since no soil excavation beyond the recently placed fill material would result from the construction of the Main Facility.

Proposed construction of the Main Facility and related natural gas pipeline, sanitary sewer, and water supply connections within the utility easement (see Chapter 15, "Utilities") (Project Components A and B) are in the vicinity of the previously identified Jersey City Water Works Pipeline and Jersey City Water Works Historic District. Avoidance of these resources would be achieved through project design so that no ground disturbance activities, including trenching and shaft drilling, are undertaken in the mapped route of the Jersey City Water Works Pipeline and Jersey City Water Works Historic District.

Preferred Alternative Project Components C and D bisect the Jersey City Water Works Pipeline at Route 7. Underground duct banks have the potential to adversely affect the Jersey City Water Works Pipeline. Preferred Alternative Project Component E runs parallel to the mapped location of the Jersey City Water Works Historic District from east of Route 7 to the Bergen Tunnel West Portal. While no contributing resources are identified in this portion of the Jersey City Water Works Historic District at this location, underground duct banks along the north side of Preferred Alternative Project Component E may have the potential to adversely affect the resource. Archaeological monitoring would be required if duct banks are proposed in areas of archaeological sensitivity associated with the Jersey City Water Works Pipeline and Jersey City Water Works Historic District. Duct banks located at grade (i.e., on the ground surface) would have no effect on archaeological resources.

Though no known archaeological resources are located within the proposed New Kearny Substation (Preferred Alternative Project Component D) footprint, this portion of the APE-below ground has high prehistoric archaeological sensitivity. Deeply buried Early to Middle Holocene upland landform soils that contain a documented prehistoric archaeological resource adjacent to the APE-below ground may extend into the new Kearny Substation portion of the APE-below ground. Installation of pile-driven foundations would have no adverse effect on any archaeological resources that may be present in the deeply buried upland soils since no soil removal would result from the installation.

Though no known archaeological resources are located along Preferred Alternative Project Component E, there is potential for archaeological sensitivity, including an area of prehistoric archaeological sensitivity where the potential for deeply buried upland soils exists. Areas of Preferred Alternative Project Component E have sensitivity for historic archaeological resources; documented below-ground historic resources include the Covert/Larch Historic District, the New York, Susquehanna and Western Railroad Engine Repair Site, and St. Peter's Cemetery.

Impacts on historic resources associated with the construction of the New NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E) would include ground disturbance for the construction of monopole foundations and duct banks which may impact archaeological resources. This portion of the APE-below ground has areas of historic archaeological sensitivity.

There are no known below-ground archaeological resources within the HBLR Headquarters footprint, where Preferred Alternative Project Component F would be constructed. However, this portion of the APE-below ground has moderate prehistoric archaeological sensitivity. Prehistoric deposits associated with two sites identified in the early twentieth century, located nearby to the northeast, potentially extend into the HBLR Headquarters portion of the APE-below ground. Installation of a pile-driven foundation for Project Component F would have no adverse effect on archaeological resources. Installation of underground duct banks or a shallow mat foundation would have no effect on archaeological resources within the APE-below ground, provided that ground disturbing activities do not disturb natural soils underlying surficial fill layers.

The Morris Canal is a below-ground architectural resource listed in the NRHP and located within or adjacent to Preferred Alternative Project Component G. However, as designed the proposed Project will avoid impacts to this resource as the largest portion of the Morris Canal is in the area of Jersey City where no new electrical lines would be installed due to the selection of Preferred Alternative Project Component F (the nanogrid at HBLR Headquarters). At remaining intersections with the Morris Canal, monopoles would be located specifically to avoid impact the resource. In addition to this resource, this portion of the APE-below ground along Preferred Alternative Project Component G has areas of prehistoric and historic archaeological sensitivity.

Impacts on historic resources associated with the construction of the new electrical lines associated with Preferred Alternative Project Components C, D, E, and G would include ground disturbance for the construction of duct banks and monopole foundations on archaeological resources. Installation of underground duct banks would have no effect on archaeological resources within the APE-below ground provided that ground disturbing activities do not disturb natural soils underlying surficial fill layers. In areas where underground duct bank excavation is planned in locations that have not been subject to fill or disturbance, archaeological monitoring would be required where excavation may impact archaeologically-sensitive areas. While monopoles are planned within archaeologically sensitive areas, the construction methods for monopole installation are unlikely to recover useful archaeological data. The small construction footprint associated with monopoles make stratigraphy difficult to observe and spoils from the drilling technique produce soils and artifacts in secondary contexts. Therefore, no further archaeological work (i.e., monitoring) is necessary at monopole locations.

Architectural Resources

Main Facility (Project Component A) and Natural Gas Pipeline Connection (Project Component B)

Preferred Alternative Project Component A as proposed would not directly affect any above-ground historic resources. The proposed exhaust stacks would be visible from multiple historic resources, the closest of which is the Old Main DL&W Railroad Historic District. Due to the heavy industrial and transportation uses that characterize this area of Kearny, the introduction of the Main Facility would not alter the setting of the surrounding historic districts to a degree that would adversely impact their character-defining features. The planned access option for Route 7 avoids direct impacts to above-ground historic resources. As site plans and plans for access roads in the vicinity of the Old Main DL&W Railroad Historic District are refined, direct impacts to the historic railroad right-of-way would be avoided to the extent feasible.

Preferred Alternative Project Component B would be constructed primarily underground and would therefore not have the potential to affect any above-ground historic resources. Provided that plans for Project Components A and B avoid direct impacts upon historic resources, and the NJHPO is given the opportunity to review and comment on any design updates or alterations, Preferred Alternative Project Components A and B would have no adverse effect on above-ground historic resources.

Electrical Lines (Project Components C, D, E, and G)

Impacts on historic resources associated with the construction of the new electrical lines would vary greatly based on the chosen installation method for specific areas. The combination of monopoles and underground duct banks 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). Generally, construction can result in interruptions to public utilities and/or transportation service delays; therefore, the proposed Project is being designed to avoid these interruptions.

The option to install new monopoles along the length of the proposed electrical line has the potential to affect numerous cultural resources. Preferred Alternative Project Components C, D, and E would include poles up to 220 feet in height and up to 6 feet in diameter. The maximum 11 feet by 11 feet foundations for the poles in certain areas and could be installed along both sides of the railroad right-of-way. The optional routing for Project Component D (see Figure 9-4) would have a greater adverse impact on the NRHP-eligible Old Main DL&W Railroad Historic District in comparison to the Preferred Alternative Project Component D. This is because the optional routing travels along the Morris & Essex Line whereas the Preferred Alternative departs from the Morris & Essex Line and travels through the railyard. Monopoles potentially 220-feet in height in Preferred Alternative Project Components C and D would alter the scale of the built environment in the section of Kearny that is characterized by industrial development. East of the Hackensack River along Preferred Alternative Project Component E, proposed monopoles would be approximately 65 feet in height, with the exception of one monopole, which would be a maximum of 220 feet high and installed on the east bank of the Hackensack River, adjacent to existing electrical line poles. Monopoles proposed within Preferred Alternative Project Component G would be no more than 39 feet in height and would be similar in scale and character to existing utility poles that extend the length of the railroad right-of-way. Though the proposed 39-foot-tall monopoles would be visible from many resources within the APE-above ground, they would not noticeably alter the existing environment to a degree that would constitute an adverse impact on these resources.

More detailed plans for the locations of the monopoles would be developed in close coordination and consultation with NJHPO to avoid direct impacts to NRHP-eligible and NRHP-listed above- and below-ground resources, as well as resources that contribute to the overall significance of any NRHP-eligible and NRHP-listed historic districts. However, some of the new monopoles would be substantially taller than the rail corridor's existing catenaries and other infrastructure and would have a cumulative adverse effect on the NRHP-eligible Old Main DL&W Railroad Historic District because they would alter the visual identity of the rail corridor, which "has maintained a high level of integrity within the corridor right-of-way" (Marcopul 2017, HPO-D2018-122 PROD). Additionally, for the same reason, monopoles constructed as part of Preferred Alternative Project Component E would have an adverse effect on the NRHP-eligible Old and New Bergen Tunnels, the NRHP-eligible West End Through Truss Bridges, the NRHP-eligible West End Interlocking Tower, the NRHP-eligible Hackensack River Lift Bridges Historic District, the NRHP-eligible Lower Hack Draw Bridge, and the NRHP-eligible DL&W Railroad Boonton Line Historic District. While the monopoles that would be installed as part of Preferred Alternative Project Component G would be visible from the resources identified within the APE-above ground, the monopoles would be similar in height to existing utility and other infrastructure and would have limited impacts on the character-defining elements that render historic resources along the corridor of Project Component G eligible for listing in the NRHP.

In order to satisfy the FTA's Section 106 responsibilities, the NJHPO was provided with the June 16, 2017 HARBS and EA Report that summarized actions proposed within the HBLR corridor. As indicated in the April 24, 2018 Consultation Comments provided by Katherine J. Marcopul, Deputy State Historic Preservation Officer, "the proposed Components F and G will not constitute an adverse effect on resources listed in or eligible for inclusion in the NJR and NR" (Marcopul 2017, HPO-D2018-122 PROD; Appendix C and D).

New Kearny Substation (Project Component D)

As currently designed, the proposed new Kearny Substation proximate to Substation No. 41, a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District, would not result in an adverse effect to this historic resource. The proposed new substation would result in the removal of several existing elements of Substation No. 41, including several modern structures; however, much of Substation No. 41's historic elements including use, setting, and superstructure would remain, and the loss of two transformers believed to be the original is considered acceptable by the NJHPO (Marcopul 2017, HPO-D2018-122 PROD).

To the west of Substation No. 41, the historic Substation 4 building is individually eligible for listing in the NRHP as a representative example of the Pennsylvania Railroad's early electrification project. The proposed Project would not directly impact the Substation 4 building. While the context of this resource would be altered by the new Kearny Substation, the change would not be significant. The proposed Project would construct infrastructure elements in an area already dominated by railroad, utility, and industrial uses. The setting of Substation 4 would remain largely the same and New Kearny Substation would therefore not result in an adverse effect on historic resources.

Hackensack River Crossing (Project Component E)

For the proposed electrical lines to cross the Hackensack River, three options are currently being considered: (1) carried aerially by two monopoles (preferred option), (2) through a submerged submarine cable, or (3) directional drilling under the river bottom. For the aerial crossing, the proposed two monopoles would be built approximately 50 feet north of the Lower Hack Draw Bridge, within the Morris & Essex Line's right-of-way and be no taller than 220 feet, with a foundation consisting of reinforced concrete pole base measuring 6 feet in diameter and a depth of 95 feet below grade. The design of these two poles would be similar to the monopoles described above for Preferred Alternative Project

Components C and D. The two proposed monopoles that would be located near the western and eastern ends of the NRHP-eligible Lower Hack Draw Bridge would have a visual adverse effect on the bridge as well as on the NRHP-eligible Hackensack River Lift Bridges Historic District due to the height of the monopoles and their limited distances from the bridge.

The option to use directional drilling or submarine cable at the Hackensack River crossing would have effects on historic resources since structures would be required on either side of the Hackensack River for the transition from monopoles to underground electrical lines. The directional drilling option would install a cable underneath the Hackensack River sediments. The submarine cable option would involve directional drilling from the ground surface on the west bank to the river bottom, laying the cable directly on the river bottom, and directionally drilling from the ground surface on the east bank to the river bottom, to avoid impacts to shoreline resources. Whether located at grade or underground, this cable could affect the Old Main DL&W Railroad Historic District if it is installed within its boundaries. Directional drilling installation has the potential to adversely affect the Old Main DL&W Railroad Historic District and could impact deeply buried prehistoric archaeological deposits that are potentially present beneath layers of fill on the east side of the Hackensack River. Submarine cable would likewise have the potential to adversely affect the Old Main DL&W Railroad Historic District. Due to the transition structures required for the electrical lines to be installed via directional drilling or submarine cable, these installation options would also have visual impacts on surrounding historic architectural resources in the APE-above ground since the structures would remain in place when the proposed Project is operational.

Bergen Tunnel (Project Component E)

New 65-foot tall monopoles are proposed for the segment of Preferred Alternative Project Component E immediately to the west of the NRHP-eligible Old and New Bergen Tunnels' western portal. As discussed above, introduction of these poles into the railroad corridor would alter its historic character and setting and would constitute a cumulative adverse effect on the historic resource. The route of the electrical line through the Old and New Bergan Tunnels, while having fewer visual impacts, would have a direct effect on the Old and New Bergen Tunnels. Direct effects would be limited to the New Bergen Tunnel (the south tunnel). The electrical line would be installed within a precast duct bank at grade between the northernmost track and the north wall of the tunnel. As proposed, the installation would not result in an adverse effect. The proposed duct banks would not have the potential to degrade important historic design elements of the tunnel.

New NJ TRANSITGRID East Hoboken Substation (Project Component E)

The new NJ TRANSITGRID East Hoboken Substation would have minimal visual impacts on surrounding historic architectural resources in the APE-above ground. These minimal visual intrusions would not have an adverse effect on above-ground historic resources.

Nanogrid (Project Component F)

At the HBLR Headquarters on Caven Point Avenue, the emergency generators and storage modules that would make up the nanogrid would be installed on an elevated platform estimated at seven feet above ground surface to comply with NJ TRANSIT's Design Flood Elevation (DFE). The proposed platform is anticipated to be approximately 20,000 square feet and the emergency generators would be 10 to 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. While components of the nanogrid may be visible from nearby historic resources, they would not be adversely affected, as the proposed nanogrid would be compatible in scale and nature to the existing surroundings.

9.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The Phase IA archaeological survey determined that the APE-below ground has low to high sensitivity for prehistoric archaeological resources and historic archaeological resources. As project plans develop and the locations, nature and extent of the proposed Project's direct impacts are refined, further archaeological work may be required to identify the presence of archaeological resources within the APE-below ground. The installation of underground duct banks or construction of foundations for new monopoles along the length of Preferred Alternative Project Components C through E, as well as areas of archaeological sensitivity in Preferred Alternative Project Component G, would have the potential for direct impacts on prehistoric and historic archaeological resources, if any exist, within the APE-below ground. Avoidance of direct impacts include alterations to monopole placement, selection of installation options that involve shallow, rather than deep, ground disturbance, and the installation of at-grade duct banks.

Archaeological monitoring is proposed and is a stipulation of the draft PA, for those areas of archaeological sensitivity where the installation of utilities and/or duct banks is planned. If archaeological resources are identified during monitoring, additional archaeological site investigation would be necessary to evaluate the potential eligibility of the resource for NRHP listing. Several areas of archaeological sensitivity were identified along the New Jersey Turnpike right-of-way/ NJ TRANSIT Easement (former northern alignment of Project Component F – Section 1) and were recommended for archaeological monitoring in the previous Supplemental Information Report for the Phase IA (RGA 2017d). As the project design has changed, these areas would no longer be impacted and would not be subject to monitoring. As archaeological monitoring of mechanically excavated monopoles is not effective in recovering useful archaeological data, no archaeological monitoring of the installation of monopoles is necessary. Archaeological work under the PA or other agreement document is recommended.

In order to satisfy the FTA's Section 106 responsibilities, a draft PA has been developed between the NJHPO, NJ TRANSIT, FTA and the ACHP (should the ACHP decide to participate) to provide for the identification, evaluation, and appropriate treatment of historic properties (see Draft Programmatic Agreement). Stipulations include the following: documentation of historic architectural resources to the standards of the Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) as prescribed by the National Park Service, a corridor study of the segment of the Old Main DL&W Railroad Historic District within the project area (from Substation No. 41 to Hoboken Yard), an historic interpretive exhibit, archaeological monitoring, Phase II archaeological investigations, assessment of effects, mitigation, curation, and reporting. The stipulations within the draft PA outline in detail all the potential actions necessary to carry out the requirements of the Section 106 process as project plans develop and are finalized.

As described above, due to the cumulative visual impact of the proposed monopoles, the proposed undertaking will have an adverse effect on the NRHP-eligible Old Main DL&W Railroad Historic District, the NRHP-eligible Old and New Bergen Tunnels, the NRHP-eligible West End Through Truss Bridges, the NRHP-eligible West End Interlocking Tower, the NRHP-eligible Hackensack River Lift Bridges Historic District, the NRHP-eligible Lower Hack Draw Bridge, and the NRHP-eligible DL&W Railroad Boonton Line Historic District. HAER documentation of the segment of the Old Main DL&W Railroad Historic District between the western terminus (Amtrak's Substation No. 41 in Cedar Creek Marsh South) of the project and the western portal of the Old and New Bergen Tunnels, the NRHP-eligible West End Through Truss Bridges, the NRHP-eligible West End Interlocking Tower, and the segment of the NRHP-eligible DL&W Railroad Boonton Line Historic District within the project's APE would be undertaken to mitigate, in part, the identified project-related adverse effects. In addition, NJ TRANSIT would undertake a comprehensive corridor study of the Old Main DL&W Railroad Historic District segment within the project area (from Substation No. 41 to Hoboken Terminal). The corridor study would include surveys of those resources associated with the historic rail corridor which have not been previously considered in earlier studies. Previous studies included resources such as stations and bridges. The resources to be included in the corridor study include, but are not limited to, signal houses, historic catenaries, tunnels, viaducts, rail yards, engine houses, shop buildings, turntables, substations and interlocking towers. In addition, NJ TRANSIT will design and install a multi-component historic interpretive display at an appropriate location at one of its facilities in the vicinity of the proposed Project. The display will be a designated historic interpretive installation that consists of between six and eight panels or cast plaques either set into the pavement within appropriate landscape surrounds, attached to an existing building or structure or mounted on one or more kiosks or similar structures. The interpretive exhibit will comprehensively address the history of rail transportation within the New Jersey Meadowlands.

As project plans are refined, coordination with the NJHPO would continue, as stipulated in the PA. Specifically, coordination regarding the localized effects of the preferred design option for electrical line installation (combination of monopoles, underground duct banks and attachment to existing infrastructure) would continue. As previously discussed, there are 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) that would determine the installation method of electrical lines at the specific locations. The Project is being designed to reduce impacts to existing utilities, including interruptions to public utilities or public transportation. If it is determined that the proposed Project would adversely affect additional historic resources in the APE-above ground, NJ TRANSIT, FTA, and the NJHPO would amend the PA as necessary to address those effects.

Chapter 10 Traffic and Public Transportation

10.1 INTRODUCTION

This chapter examines the potential for the Build Alternative to impact traffic and public transportation in the study area. It includes an analysis of the potential traffic and public transportation impacts related to the operation of the proposed Project. Under emergency conditions, the proposed Project would result in continued rail public transportation operations similar to normal conditions. Consistent with the Project purpose and need, this would be a net beneficial effect of the project. Under normal operating conditions, there will be no change to the number or frequency of trains as a result of the proposed Project. There will be no adverse impact to road traffic, public transportation or other mode from installation of electrical lines or new substations, once the project is operational. The traffic evaluation included in this chapter discusses impacts of the proposed Project as a whole since there would be no traffic fluctuations as a result of installation of electrical lines, new substations or the nanogrid at HBLR Headquarters.

10.2 AFFECTED ENVIRONMENT

10.2.1 Traffic

<u>Route 7</u>

Route 7 is an Urban Principal Arterial running north-south in Hudson County (see Figure 10-1). Its southern terminus is at the recently reconstructed interchange with Route 1&9 in Jersey City. North from that point, Route 7 crosses the Hackensack River via the Wittpenn Bridge (construction for bridge replacement is currently underway) where it enters into the Town of Kearny and passes the Main Facility site and the six-acre parcel (Preferred Alternative Project Components A and B). From the interchange with Route 1&9 in Jersey City, past the Main Facility site to the interchange with Route 508, Route 7 is known as the Newark-Jersey City Turnpike. Further north, Route 7 is also known as the Belleville Turnpike and accesses the northern portions in Kearny before crossing the Passaic River into Belleville.

Route 7 provides two lanes for each direction of travel over the Wittpenn Bridge, three lanes in each direction between the interchanges for Fish House Road (County Route [CR] 659) and Newark-Jersey City Turnpike (CR 508), and one lane in each direction on the Belleville Turnpike section of the roadway. The posted speed limit varies between 35 and 50 mph along the Route 7 corridor. Near the Main Facility site, the speed limit is 50 mph.

The NJDOT is currently constructing the Wittpenn Bridge Replacement Project, which involves replacing the Route 7 bridge over the Hackensack River. Work is anticipated to be completed by the summer of 2022. Infrastructure improvements associated with the project include:

- New vertical lift bridge situated to the north of the existing bridge;

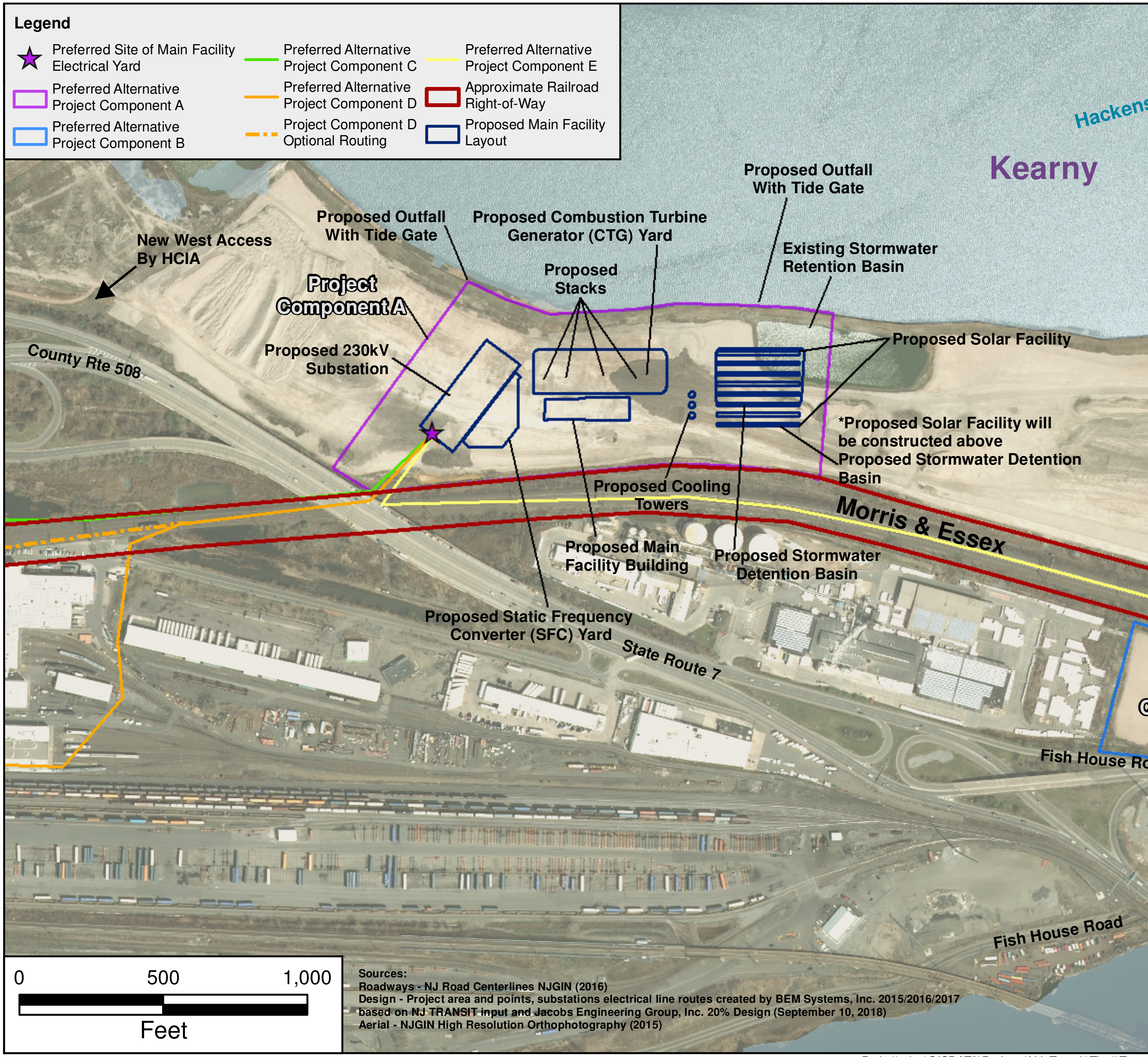

Figure 10-1: Roadways Near Project Components A/B

NJ TRANSITGRID TRACTION POWER SYSTEM

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- Route 7 realignment to the north of the existing roadway;
- Improvements to the Route 7 interchange with Fish House Road; and
- New connection ramps in Jersey City.

Traffic data for Route 7 was obtained from the NJDOT Traffic Count Reports program and are summarized in Table 10-1.

Table 10-1 Route 7 Traffic Data - 2013 and 2017

				Peak Hour Traffic					
				AM			PM		
Roadway	**Direction**	**Lanes**	**AADT[1]**	**Time**	**Volume[2]**	**Status**	**Time**	**Volume[2]**	**Status**
Route 7[3] (Newark-Jersey City Turnpike Section)	Northbound	3	26,200	7-8 AM	1,600	Under Capacity	4-5 PM	2,400	Under Capacity
	Southbound	3	30,000	7-8 AM	2,600	Under Capacity	4-5 PM	1,900	Under Capacity
Route 7[4] (Belleville Turnpike Section)	Northbound	1	8,900	6-7 AM	1,000	Under Capacity	4-5 PM	600	Under Capacity
	Southbound	1	8,500	6-7 AM	500	Under Capacity	4-5 PM	850	Under Capacity

Source: *NJDOT Traffic Count Reports 2013 and 2017. Traffic counts for 2017 provided by NJDOT staff via e-mail on August 30, 2018.*

1 – Annual Average Daily Traffic

2 – Vehicles per hour

3 – NJDOT Traffic Counts for 2013

4 - NJDOT Traffic Counts for 2017

County Route 659

Fish House Road, also known as Hudson CR 659, is an Urban Minor Arterial running east-west in Kearny. The eastern terminus of the roadway is located at its interchange with Route 7. Heading west, CR 659 is known as Pennsylvania Avenue and then Central Avenue before its western terminus with US Route 1&9 Truck Route.

Fish House Road generally provides one lane for each direction of traffic, has a posted speed limit of 25 mph, and services predominantly industrial land uses. The truck entrance to the CSX South Kearny Yard is located along the roadway and generates heavy vehicle volume activity to the area.

A traffic count from 2017 was obtained from the NJDOT Traffic Count Reports program, and is summarized in Table 10-2.

Table 10-2 County Route 659 Traffic Data - 2017

				Peak Hour Traffic					
				AM			PM		
Roadway	**Direction**	**Lanes**	**AADT[1]**	**Time**	**Volume[2]**	**Status**	**Time**	**Volume[2]**	**Status**
County Route 659	Eastbound	1	6,100	6-7 AM	370	Under Capacity	4-5 PM	610	Under Capacity
	Westbound	1	5,400	6-7 AM	500	Under Capacity	4-5 PM	400	Under Capacity

Source: *NJDOT Traffic Count Reports 2017. Traffic counts for 2017 provided by NJDOT staff via e-mail on August 30, 2018.*
[1] – Annual Average Daily Traffic
[2] – Vehicles per hour

The traffic volumes presented in this analysis – a combination of 2013 and 2017 data sets – are within a reasonable period of 5 years of the current 2018 analysis year being addressed in this DEIS. The study roadways serve the travel needs of existing or potential future in-fill development along the corridors, and between origins and destinations that are densely developed, mature urban centers. It is unlikely that significant growth in traffic volume has occurred since 2013 that has reduced the ability of these roadways to adequately accommodate travel demand. Therefore, the volume data represented by these years are considered to be applicable and acceptable for the purposes of this analysis. The proposed Project area roadways are reportedly operating with excess capacity under typical conditions.

Redevelopment Area and Route 7 Access

As explained in Chapter 2, HCIA is in discussions with the NJDOT regarding a plan to provide ingress and egress from the Redevelopment Area to Route 7 for large/commercial vehicles. Options reviewed have included connecting to Route 7 via the southwestern gate area and use of a bed of a former rail line, owned by HCIA, for a road through the Standard Chlorine Chemical Company (SCCC) site connecting to an existing paved driveway to Route 7. Currently, access to the Main Facility site is via an underpass of the Morris & Essex Line near Fish House Road (see Figure 10-1).

10.2.2 Passenger Rail Operations

Several passenger rail lines traverse the study area. Amtrak's Northeast Corridor is an electrified regional rail line servicing the northeast United States. The line is powered by an overhead catenary system for the entire corridor. NJ TRANSIT operates some of its commuter rail service on a portion of the Northeast Corridor for access to New York Penn Station. The Northeast Corridor is located in proximity to the existing Amtrak Substation No. 41 and proposed location of the new Kearny Substation (Preferred Alternative Project Component D) and Main Facility site (Preferred Alternative Project Component A). There are no stations for the Northeast Corridor in the Project area; commuters access the line at Newark Penn Station to the west and Secaucus Transfer Station to the east.

NJ TRANSIT's Morris & Essex Line borders the Main Facility site to the south. The Morris & Essex Line is also powered by electrical overhead catenary systems. The closest stations are Newark's Broad Street Station to the west and Hoboken Terminal to the east.

NJ TRANSIT's Main Line serves northern New Jersey, and stops at Secaucus Transfer Station before terminating at Hoboken Terminal. The Main Line is not located near the project site, as it lies north and east of the Project area. All trains on the Main Line use diesel-electric powered locomotives.

NJ TRANSIT's HBLR System travels north-south through Hudson County. This light-rail system is completely reliant on the commercial electric power grid for electrification and traction power.

10.3 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

10.3.1 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. 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 at a future and undetermined date pending funding. 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-acre parcel that NJ TRANSIT is acquiring would likely either remain vacant or be used for ancillary railroad purposes.

As discussed in Chapter 1, "Purpose and Need," previous major weather events have had direct impacts to the commercial power grid in the project area, resulting in power outages to millions of utility customers for multiple days following each major weather event. The public transportation infrastructure that connects Manhattan with northern New Jersey was severely affected in each of these cases. During these widespread power outages, NJ TRANSIT services that were impacted included NJ TRANSIT's light rail, bus service and commuter rail, as well as ferry facilities in the region. Without the proposed Project, commuters that use the commuter and light rail systems (an estimated 143,000 daily customers that make up the total rail-based market in the service territory, and an average of just under 52,000 daily riders that also utilize the HBLR) would continue to be at risk of being stranded or delayed during future widespread commercial power grid outages, since other transportation infrastructure (e.g., buses, ferries, and highways) is already operating at capacity.

NJ TRANSIT maintains a Comprehensive Emergency Management Plan (CEMP) and a series of Emergency Operations Annexes for its business lines and departments in the event a severe storm is imminent in the region. The CEMP and its annexes focus on operationally preventative losses and provide no guarantee that critical functions will be operational during or after a severe weather event. The plan includes procedures for scaling service down in the days leading to a severe weather event, when advance notice and predictions of such an event are available. Under the No Action Alternative, NJ TRANSIT will continue to implement the practices outlined in the CEMP in order to ensure life safety, provide for life support and incident assessment, and restore NJ TRANSIT operations to limit community impacts and economic disruptions. (NJ TRANSIT 2014)

Under the No Action Alternative, HCIA's proposed re-development of a portion of the Koppers Coke Peninsula with four high-cube warehouse buildings and one high-cube warehouse building on the adjoining redevelopment parcel would take place by 2021. The additional warehouse buildings will generate approximately 426 new trips (302 enter, 124 exit) during the weekday morning peak hour and 487 new trips (179 enter, 308 exit) during the weekday evening peak hour. Based upon the results of HCIA's analyses (Langan 2016), the proposed warehouse development is expected to have no significant impact on area traffic operations during peak hours. An access permit from NJDOT will be required by the developer for the proposed Route 7 driveway.

10.3.2 Build Alternative

Traffic

The Main Facility site would be operated by relatively few employees on a daily basis (approximately 10 per shift). Therefore, a shift change would generate a maximum of 20 trips per hour entering and exiting the facility. These trips would typically occur during off-peak hours as shift changes are likely to be at 6 AM, 2 PM and 10 PM. Deliveries to the facility would be minimal, with approximately 7 to 10 truck trips per week. Current access to the Main Facility is via Fish House Road and passage beneath the Morris & Essex Line via a confined concrete box culvert, which restricts the height and width of vehicles that can enter the site. Depending on the timing of the other development within the Redevelopment Area, the frontage road and Route 7 access point improvements may or may not be in place when construction for the Build Alternative is proposed to begin. In the event that the access improvements are delayed, NJ TRANSIT has proposed a driveway for access to the Main Facility site. The driveway would be connected to westbound lanes of Route 7 and would provide access along the southwest boundary of the Koppers Koke site to the Main Facility footprint.

The only Project Component that would result in a permanent minor increase in traffic is the Main Facility, due to approximately 30 new jobs being created, once in operation. All of project ingress and egress points will not change in terms of employee or public accessibility and therefore traffic fluctuations are not expected.

In N.J.A.C. § 16:47-1.1 (2014), NJDOT defines a "significant increase in traffic" as 100 movements during the peak hour and 10 percent of the daily movements on study area roadways. Therefore, the Project attributable anticipated traffic impact on the surrounding roadway network is characterized as minimal since very few trips would occur during peak hours and the daily site activity would be well below 10 percent of the average daily traffic of Route 7 and other study area roadways. With or without the warehouse development that is being contemplated for the Redevelopment Area, the traffic associated with the Main Facility site would be easily accommodated into the traffic network with little noticeable effect.

During emergency conditions (e.g., commercial power grid outage), the functionality of the HBLR and other rail operations would continue. However, for at-grade roadway crossings, the roadway controls would lack power, so NJ TRANSIT police and local municipal police would direct traffic to maintain public safety.

Public Transportation

The electrical lines would connect and power Amtrak and NJ TRANSIT substations. During a commercial power grid outage, the microgrid would improve public transportation, by providing a resilient power source to operate commuter and intercity rail service. The Build Alternative would ensure continuing operations for NJ TRANSIT rail and limited Amtrak services that operate in the core service territory during a power outage. As discussed in Chapter 2, “Project Alternatives,” the following services would be available during a commercial power outage:

- Limited commuter rail service on Amtrak’s Northeast Corridor between New York Penn Station and County Yard/Jersey Avenue Station in New Brunswick;
- Limited NJ TRANSIT commuter rail service between Hoboken Terminal and Millburn Station on the Morris & Essex Line; and
- Service on NJ TRANSIT’s HBLR between Tonnelle Avenue in Norther Bergen and 8^{th} Street in Bayonne.

The proposed Project would enhance reliability in the service area and allow NJ TRANSIT to restore service quickly after a major event that causes a power outage of the commercial grid. This would reduce strandings and delays to the daily commuters during power outages and reduce the additional strain on other transportation infrastructure (e.g., buses, ferries, and highways). The proposed Project would also help to alleviate increased vehicular traffic resulting from emergency situations (evacuations, recovery operations) where the commercial power grid is affected.

Consultation with the Federal Aviation Administration (FAA) was conducted as discussed in Chapter 21, “Agency Coordination and Public Participation” (also see Appendix D, “Agency Correspondence”). FAA did request that 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. 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 a new obstacle 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.

10.4 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

Under normal operating conditions, there would be no impact (adverse or favorable) to vehicular traffic conditions or to the customers of the public transportation system in the project area. No significant changes in traffic patterns would occur. Since the Build Alternative will provide resilient electric power to Amtrak and NJ TRANSIT rail lines, including during emergency conditions that disrupt the commercial power grid, both vehicular traffic conditions and the public transportation system would realize positive impacts. Any loss of rail service during widespread power outages currently results in increased vehicular traffic in an already congested region. With implementation of the Build Alternative, these consequences would be lessened as emergency and limited rail service would be available in the region during a commercial electric power grid outage. In summary, the Build Alternative would not result in significant adverse impacts to traffic or public transportation. Instead, it would fortify public transportation in the region. As a result, mitigation measures for the Build Alternative are not required.

Chapter 11 Noise and Vibration

11.1 INTRODUCTION

This chapter evaluates the operational effects of the Build Alternative on noise and vibration levels in the study area. Changes to noise or vibration at nearby land uses could occur from operations at the Main Facility site or near the new substations and emergency generators at HBLR Headquarters (the "nanogrid"). Once installed, the electrical lines (which are included in Project Components C through G) and utility connections would not have an impact on noise and vibration in the study area. There will be no change to noise or vibration near residential or commercial properties once the project is operational since there will be no increase in number or frequency of trains as a result of the proposed Project. Noise and vibration effects that would result from the proposed Project's construction are presented in Chapter 17, "Construction Effects."

11.2 REGULATORY CONTEXT AND METHODOLOGY

11.2.1 FTA Guidance

The FTA *Transit Noise and Vibration Impact Assessment Manual* (FTA Report No. 0123 September 2018), ("FTA Noise & Vibration Manual") sets forth the methods and procedures for determining the level of nuisance noise and vibration impact resulting from federally-funded transit projects. It outlines a three-step approach for the analysis of noise and vibration: a screening procedure to identify whether any sensitive uses are located within a distance that could be affected by the project; a general assessment methodology to identify locations with the potential for impacts if sensitive land use is located within the screening distances; and, a detailed analysis, if warranted, from the results of the general assessment (FTA 2018).

Table 4-3 (noise) and Table 6-1 (vibration) of the FTA Noise & Vibration Manual define criteria based on the specific type of land use that would be affected, as follows:

- **Category 1 (High Sensitivity):** For noise, land where quiet is an essential element of the intended purpose (e.g., outdoor amphitheaters and concert pavilions, national historic landmarks with considerable outdoor use and recording studios and concert halls). For vibration, buildings where low ambient vibration is essential for the operations within the building (e.g., vibration-sensitive research and manufacturing, hospitals, and university research operations);

- **Category 2 (Residential):** For noise and vibration, residences and buildings where people normally sleep (e.g., homes, hospitals, and hotels);

- **Category 3 (Institutional):** For noise, institutional land uses with daytime and evening use (e.g., schools, libraries, theaters, parks/recreational areas and churches) where avoiding speech interference is critical. For vibration, schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference;

- **Special Buildings (Table 6-1 only)**: For vibration only, a fourth category includes special-use facilities that are very sensitive to vibration noise that are not included in the categories above and require special consideration (e.g., concert halls, TV and recording studios and theaters.

If it is determined that there are no sensitive land uses within screening distances that are identified to encompass all potentially impacted locations, then no further noise analysis is needed. If one or more sensitive land uses are within the screening distances, then further analysis is needed. While no screening distances are presented in the FTA Noise & Vibration Manual for new power generating facilities, according to Table 4-7 of the FTA Noise & Vibration Manual a screening distance for noise from power substations is 250 feet. Transit projects that do not involve vehicles do not have potential for vibration impact and do not require further analysis, as stated in the FTA Noise & Vibration Manual. Since the proposed Project will not increase the number or frequency of trains in the service area, a vibration impact analysis is not required for this project. Construction impacts are descripted in Chapter 17, "Construction Effects."

It is acknowledged in the FTA Noise & Vibration Manual that since its methods have been developed to assess typical transit projects, there will be some situations not explicitly covered and the exercise of professional judgment is required to extend the basic methods in these cases.

11.2.2 Redevelopment Area Performance Standards

The Redevelopment Plan indicates that all uses shall comply with the Category C environmental performance standards found in N.J.A.C. § 19:4-7.3 (2013) (noise) and N.J.A.C. § 19:4-7.4 (2013) (vibration) (NJMC 2013). In accordance with the noise performance standard, noise generated by the new facilities shall not exceed 76 A-weighted decibels (dBA) on or beyond the zone boundaries (notwithstanding the exceptions). This level may be exceeded by 10 dBA for a single period not to exceed 15 minutes in any one day. For impact noise, this level may be increased by 20 dBA. In accordance with the vibration performance standard, maximum allowable peak particle velocities (PPV) shall not exceed 0.10 inches per second on or beyond the zone boundaries. Maximum allowable PPV from impact vibrations (i.e., discrete impulses that do not exceed 60 per minute), shall not exceed 0.20 inches per second on or beyond the zone boundaries.

11.3 AFFECTED ENVIRONMENT

The Koppers Koke Site is currently undeveloped and lies within an industrial area. The location of the new Kearny Substation (part of Preferred Alternative Project Component D) is adjacent to the heavily used Northeast Corridor. The location of the new NJ TRANSITGRID East Hoboken Substation (part of Preferred Alternative Project Component E) is in close proximity to the heavily used Hoboken Terminal & Yard. The nanogrid (Preferred Alternative Project Component F) is located on NJ TRANSIT-owned property that is already used for transportation purposes. The nearest sensitive receptors to the Main Facility site and proposed new Kearny Substation are residences and parkland located more than 0.9 miles and 0.7 miles away, respectively. The nearest sensitive receptor for the new NJ TRANSITGRID East Hoboken Substation is approximately 330 feet away (Category 2 - Residential). As discussed in Chapter 3 “Land Use, Zoning and Public Policy” high-density residential dwellings (Category 2 - Residential) are located within the 500-ft buffer of the HBLR Headquarters in Jersey City, which is the location of the proposed nanogrid (Preferred Alternative Project Component F). However, the nanogrid will be installed at a location within the NJ TRANSIT-owned property that is greater than 600 feet from the nearest sensitive land use and the emergency generators would be installed within a sound-proofed enclosure in order to prevent an increase to noise levels during emergency conditions. As a result, there are no noise- sensitive receptors in FTA Categories 1, 2 or 3 within any of FTA’s screening distances according to Table 4-7 of the FTA Manual for the proposed Main Facility site, the new Kearny Substation, the NJ TRANSITGRID East Hoboken Substation or the emergency generators for the nanogrid at HBLR Headquarters.

11.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

11.4.1 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 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.

11.4.2 Build Alternative

Based on the FTA screening procedures, no general or detailed assessments of transit noise are warranted since there are no sensitive land uses within screening distances according to Table 4-7 of the FTA Manual that could be affected by the proposed Project. Noise levels at sensitive receptor locations, which are located more than 0.7 miles away for the Main Facility and new Kearny Substation, over 330 feet for the new NJ TRANSITGRID East Hoboken Substation, and over 600 feet for the nanogrid, would not change as a result of the proposed Project. Since the proposed Project will not increase the number or frequency of trains in the service area, a transit vibration impact analysis is not required for this project.

To analyze the operational noise impacts of the Main Facility, substations, and “nanogrid,” this study analyzed noise and vibration using NJDEP Noise Control Standards as well as local municipal noise ordinances. According to the NJDEP Noise Control Standards, the noise level should not exceed a continuous airborne sound of 65 dBA or an impulsive sound of 80 dBA from 7:00 A.M. to 10:00 P.M. The noise level should not exceed a continuous airborne sound of 50 dBA during nighttime hours. The noise level standards for NJDEP are presented in Table 11-1, along with noise level standards for municipalities where they differ from NJDEP.

Table 11-1: Noise Levels for New Jersey and Municipalities

Municipality	Time	Limit
NJDEP – Night	10:00 pm to 7:00 am	50 dBA
NJDEP – Day	7:00 am to 10:00 pm	65 dBA continuous; 80 dBA impulse
Bayonne	6:00 pm to 7:00 am, weekdays; 6:00 pm to 9:00 am, weekends & holidays	65 dBA
Hoboken	7:00 am to 10:00 pm	65 dBA continuous; 80 dBA impulse
Jersey City	24-hours	65 dBA
Kearny – Day	11:00 am to 10:00 pm	65 dBA
Kearny – Night	10:00 pm to 11:00 am	50 dBA
Newark – Day	7:00 am to 8:00 pm, except Sunday	65 dBA
Newark – Night	8:00 pm to 7:00 am, and all Sunday	50 dBA
Secaucus	24-hours	65 dBA
Union City, construction activities	9:00 am to 8:00 pm	83 dBA at 25 ft, or 86 dBA at project boundary
West New York	6:00 pm to 7:00 am, weekdays; 6:00 pm to 9:00 am, weekends & holidays	65 dBA

The Main Facility, the new substations, and the nanogrid would be designed to meet all applicable noise and vibration standards. Normal operations of the Main Facility would not cause vibration impacts. Steam blows are required to clear equipment of construction debris (e.g., welding slag), and would not be required during normal operations or maintenance. This activity is discussed in greater detail in Chapter 17, “Construction Effects.” 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. Sound levels from the Main Facility are expected to be 85 dBA at a distance of 3.3 feet from the equipment. This sound level would drop to 50 dBA at a distance of 185 feet, so no sensitive or non-sensitive receptors would be impacted by noise levels. During emergency scenarios where the commercial power grid is not active, the emergency generators for the nanogrid (Preferred Alternative Project Component F) would be operational to provide power to the southern portion of the HBLR. The equipment would be located more than 600 feet from the nearest sensitive receptor and the equipment would be installed within noise-attenuating enclosures in order to minimize increases in noise levels during operation, so no adverse impacts would occur from the one-hour of monthly testing or from the full-time operation during emergency conditions. Noise and vibration impacts for construction activities are discussed in Chapter 17, "Construction Effects."

11.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

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. No mitigation measures are required with the proposed design, which includes noise-attenuating enclosures for the nanogrid.

Chapter 12 Natural Resources

12.1 INTRODUCTION

This chapter examines the potential for the No Action and Build Alternative to impact natural resources, once the proposed Project is operational. Impacts to natural resources during construction (within the limits of disturbance required for access, staging and construction) is discussed in Chapter 17, "Construction Effects". Natural resources include mapped or field confirmed regulated watercourses and their associated freshwater and tidal wetlands. They also include floodplains, riparian zones, the coastal zone and water quality considerations, as well as federal and state documented endemic and migratory fish, avian, terrestrial and threatened and endangered species, and the supporting habitats in which they are dependent on and have been documented to coexist. These are largely federally administered through the U.S. Fish and Wildlife Service (USFWS), the State-NJDEP National Heritage Program (NHP), and National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS).

Identified natural resources in and near the proposed Project area are described below, followed by an assessment of the potential impacts from the No Action and the Build Alternative, and the measures that will be employed to avoid, minimize, or mitigate required impacts. Regulatory agency correspondence (federal and state) related to the natural resource assessments are included in Appendix D.

12.2 REGULATORY CONTEXT

Under the Build Alternative, proposed regulated actions such as clearing of vegetation, filling or grading activities in the natural resources described above, or established regulatory buffers would require compliance with applicable federal, state, and local legislation that is intended to protect and regulate actions in natural resources. The applicable federal laws, New Jersey state laws, and local regulations are described below.

FEDERAL

<u>Executive Order 11990 (Protection of Wetlands)</u>

In accordance with Executive Order 11990, "Protection of Wetlands," and the DOT Order 5660.1a, "Preservation of the Nation's Wetlands," federal agencies must minimize negative impacts to wetland environments and preserve and enhance existing wetland areas when proposing to develop within or adjacent to a wetland area. Specifically, federal agencies must avoid undertaking or providing assistance for new construction in wetlands unless there is no practical alternative to such construction and the proposed action includes all practicable measures to minimize harm to the wetlands.

Clean Water Act (33 U.S.C. § 1251 to 1387 [1972])

Activities proposed within watercourses or adjoining landward areas that could discharge to waters are governed by the Clean Water Act (CWA). The CWA was amended in 1972 to monitor pollution control programs country-wide, and ensure no harmful materials are discharged into waters of the United States without proper pre-treatment mechanisms in place, and federal and state authorization. The EPA, which is authorized to enact the CWA, works with its federal, state and tribal regulatory partners to monitor and ensure compliance with clean water laws and regulations in order to protect human health and the environment. Additionally, the Act's National Pollutant Discharge Elimination System (NPDES) program regulates point sources that discharge pollutants into waters of the United States.

Pollutions and Harbors Act of 1899

The Pollutions and Harbors Act of 1899 prohibits the dumping of refuse into navigable waters or the creation of any navigational obstruction, and it regulates the construction of wharves, piers, jetties, bulkheads, and similar structures in ports, rivers, canals, or other areas used for navigation. It provides useful supplemental jurisdiction for addressing certain kinds of water pollution, and especially for dredge and fill activities. As with the CWA, discharges of refuse or fill material or construction activities in waterways, require a permit.

Coastal Zone Management Act of 1972 (16 U.S.C. § 1451 to 1465 [1972])

The Coastal Zone Management Act of 1972 promotes the development and growth of coastal areas in the best interest of the public while preserving the coastal environments to the best extent practicable. US Army Corp of Engineers (USACE) permits issued in New Jersey must obtain a Coastal Zone Consistency Determination that evaluates a project's consistency with New Jersey's Coastal Zone Management program.

Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 to 1883 [1976])

Magnuson-Stevens Fishery Conservation and Management Act, first enacted in 1976 (and amended by P.L. 109-479), protects and preserves marine fisheries from overfishing and overpopulation, and maintains a balance between fishery growth and economic and social benefits and sustainability. Specifically, protected areas are identified as Essential Fish Habitat (EFH), which are bodies of water essential to fish reproduction, maturity, foraging and migratory needs. The NMFS comments on activities proposed by federal agencies that may adversely impact aquatic resources designated as EFH.

Endangered Species Act of 1973 (16 U.S.C. § 1531 to 1544 [1973])

The Endangered Species Act (ESA) of 1973 (16 U.S.C. § 1531-1544, 87 Stat. 884 [1973]) prohibits the disruption, harm or taking of an endangered species without a permit. Additionally, endangered species have designated critical habitats associated with their habitat needs, including breeding, foraging and maturity growth, within which the ESA also prohibits any negative impact that destroys or adversely modifies designated critical habitat, established by species record sightings or protective buffers.

Fish and Wildlife Coordination Act (P.L. 850624; 16 U.S.C. § 661 667D [1958])

The Fish and Wildlife Coordination Act, enacted March 10, 1934, authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. This Act also directs the Bureau of Fisheries to use impounded waters for fish-culture stations and migratory-bird resting and nesting areas and requires consultation with the Bureau of Fisheries prior to the construction of any new dams to provide for fish migration. In addition, this Act authorizes the preparation of plans to protect wildlife resources, the completion of wildlife surveys on public lands, and the acceptance by the federal agencies of funds or lands for related purposes provided that land donations received the consent of the state in which they are located.

Migratory Bird Treaty Act of 1918 (16 U.S.C. § 703-712 [1918])

The Migratory Bird Treaty Act of 1918 (MBTA) makes it illegal to hunt, take, capture, pursue, or sell birds listed without a waiver from the USFWS. There are currently over 800 birds on the list, including bald eagle (*Haliaeetus leucocephalus*), black-capped chickadee (*Parus atricapillus*), northern cardinal, (*Cardinalis cardinalis*), northern mockingbird (*Mimus polyglottos*), and other song birds, game birds, and raptors. The MBTA also grants the Secretary of the Interior with the authority to establish hunting seasons for migratory game birds on the list.

Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668(c) [1962])

The Bald and Golden Eagle Protection Act (BGEPA) protects two species of eagle. The Bald Eagle Protection Act of 1940 was amended to include the golden eagle (*Aquila chrysaetos*) in 1962. The Act prohibits the "taking" of bald eagles, which includes parts, nests, and eggs, as well as molesting or disturbing the birds. The BGEPA also grants the Secretary of the Interior with the authority to issue permits for scientific takings, as well as relocations of nests for safety concerns and conflicts with certain activities.

Executive Order 11988 (Floodplain Management)

Federal Executive Order 11988 "Floodplain Management," as amended, directs federal agencies to "take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." The DOT Order 5650.2 "Floodplain Management and Protection" contains policies and procedures for implementing Executive Order 11988. The FEMA has procedures under 44 C.F.R. § 9 "Floodplain Management and Protection of Wetlands," which are administered at a state level under Title 7 of N.J.A.C. § 13 "Flood Hazard Area (FHA) Control Act Rules". These policies require an analysis to identify and quantify impacts on natural and beneficial floodplain values, and the subsequent preservation or restoration of the natural floodplain and its beneficial values as affected by a project. Under DOT Order 5650.2, an impact is characterized as a significant encroachment if it would involve: a considerable probability of loss of human life; likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility; or a notable adverse impact on natural and beneficial floodplain values.

STATE OF NEW JERSEY

NJDEP Tidelands Act (Title 12 New Jersey Statutes Annotated (12 N.J.S.A. § 3-1 [2016])

Tidelands are lands now or formerly flowed by the mean high tide of a natural waterway. The state asserts an ownership interest in all tidelands not previously sold via riparian grants. The Tidelands Resource Council is the public body responsible for the stewardship of the state's riparian lands. The council determines whether applications for the lease, license, or grant of riparian lands are in the public interest, and whether the state may have a future use for such lands. The council oversees tideland areas, and provides permissions to use these lands, which could be provided through a Tidelands License or Lease, or sold through a Riparian Grant at fair market value.

Waterfront Development Act (12 N.J.S.A. § 5-3 [2016] and 7 N.J.A.C. § 7 and § 7E [2019])

NJDEP's Waterfront Development Act is the state subset of this Coastal Zone Management Act of 1972 and regulates any development along waters and associated landward waterfront of any navigable water by ensuring the development maintains the balance of public recreational use and a healthy coastal environment. The NJDEP may, by appropriate action in any court, prevent the encroachment or trespass upon the waterfront of any of the navigable waters of the state or bounding thereon, or upon the riparian lands of the state, and compel the removal of any such encroachment or trespass, and restrain, prevent and remove any construction, erection or accretion injurious to the flow of any such waters, which may be detrimental to the proper navigation thereof and the maintenance and improvement of commerce thereon.

Flood Hazard Area Control Act (58 N.J.S.A. § 16A-50 ET SEQ. [2018] and 7 N.J.A.C. § 13 [2018])

At the state level, activities in the flood hazard area are regulated under the NJDEP FHA Rules and require formal permit authorization. Additionally, the NJDEP FHA Rules regulate activities within a riparian zone, which is defined by the rules as the land and vegetation within each regulated water, as well as the land and vegetation within a certain distance of a regulated water. Activities in riparian zones, such as grading, the placement of fill, the cutting or clearing of vegetation, and the creation of impervious surface, are subject to NJDEP regulation.

Freshwater Wetlands Protection Act (13 N.J.S.A. § 9B-1 ET SEQ. [2016] and 7 N.J.A.C. § 7A [2018])

Unlike many other states, regulation of freshwater wetlands and open waters in the state of New Jersey is under the jurisdiction of the NJDEP, and not the USACE (the Meadowlands being the only exception). The NJDEP's Freshwater Protection Act Rules are based on the federal Clean Water Act and Rivers and Harbors Act, and regulate any activities within freshwater wetlands and state open waters, and if required, compensatory mitigation for any proposed actions within these regulated areas.

LOCAL

New Jersey Sports and Exposition Authority (NJSEA)

The Meadowlands District contains a significant land and water habitat complex currently managed by the NJSEA. One of the NJSEA's goals is to preserve or enhance the more than 8,400 acres of wetlands and open water in the Meadowlands District. Wetlands within the Meadowlands District are under jurisdiction of the USACE rather than NJDEP, as defined under the Freshwater Protection Act Rules 7 N.J.A.C. § 7A-1.3 [2018] – Delegable Waters.

Hudson, Essex, Passaic Soil Conservation Districts

Empowered to conserve and manage soil and water resources in cooperation with the State Soil Conservation Committee, the Hudson, Essex, Passaic Soil Conservation District addresses stormwater, soil erosion and sedimentation issues that result from land disturbance activities (primarily construction). District certification of plans for qualifying projects is a prerequisite to local construction permits. The mission of the State Soil Conservation Committee is to provide leadership in the planning and implementation of natural resource management programs for the agricultural and development communities and the general public through a locally based delivery system in coordination with local, state, and federal partners.

12.3 AFFECTED ENVIRONMENT

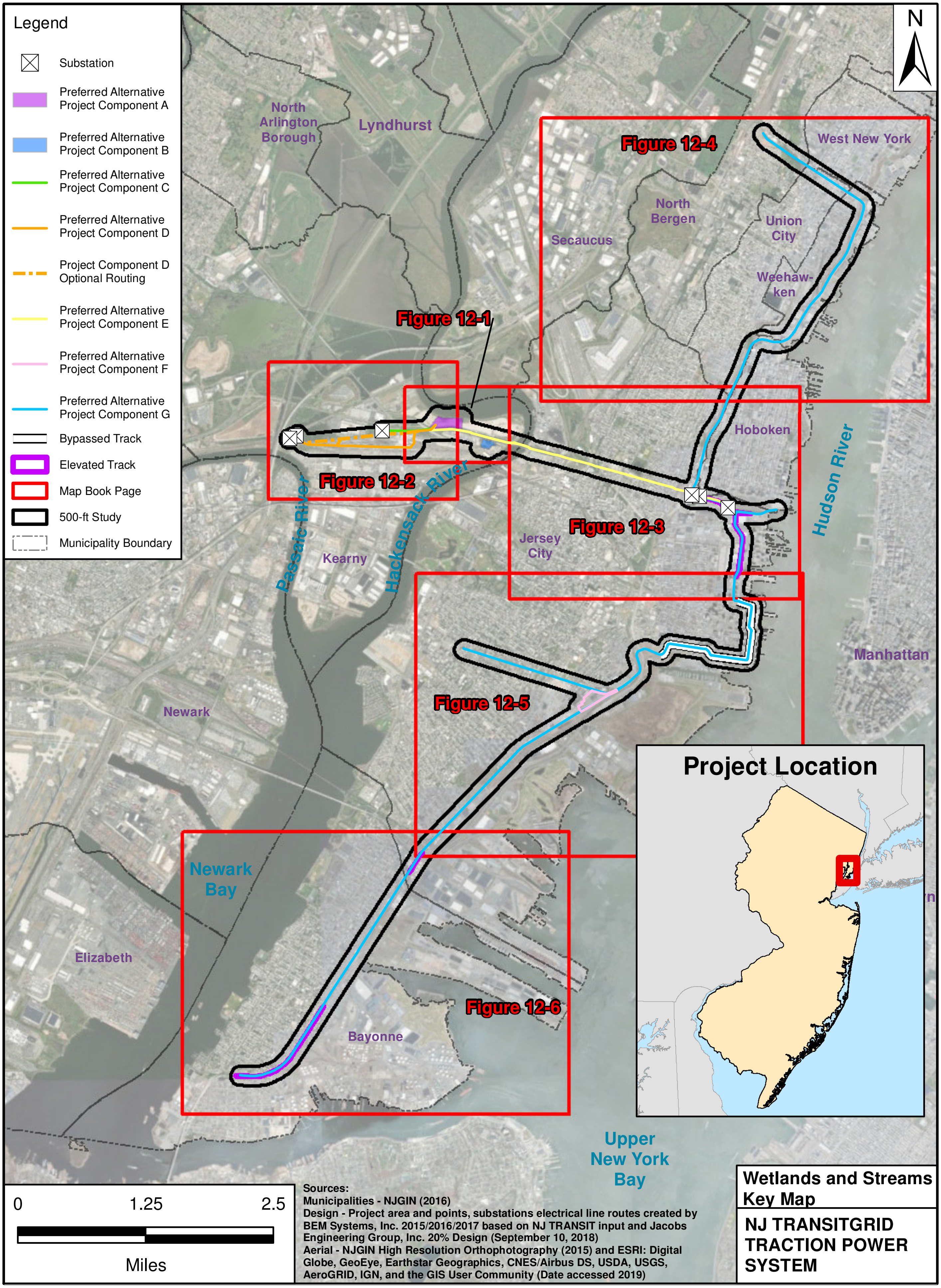
The natural resources analysis for the proposed Project is discussed below.

The tidally-influenced Hackensack River is the most prominent natural feature within the proposed Project area, whereas the Project area is bounded by the Passaic and Hudson Rivers. The Hackensack River is approximately 45 miles long, and its fresh headwater contributions converge with tidal inputs received from Newark Bay and the Atlantic Ocean, resulting in a brackish mix at the Meadowlands wetland preservation area. Waters from the Hackensack ultimately discharge into Newark Bay (a sub-estuary of New York Harbor) when the tide recedes. The Hackensack watershed includes parts of the New Jersey suburban area west of the lower Hudson River, which it roughly parallels, separated from New York City by the New Jersey Palisades geologic ridge.

12.3.1 Watercourses / Water Quality/ Sole Source Aquifer

Watercourses / Water Quality

The Project area is located to the east of the Passaic River, is bisected by the Hackensack River, and is located to the west of the Hudson River, as shown on Figures 12-1 through 12-6. As defined in the NJDEP Surface Water Quality Standards (SWQS) under 7 N.J.A.C. § 9B-1.4 [2016], freshwater(s) are, "…all non-tidal and tidal waters generally having a salinity, due to natural sources, of less than or equal to 3.5 parts per thousand and mean high tide," and non-trout waters are, "…fresh waters that have not been designated as trout production or trout maintenance. These waters are generally not suitable for trout



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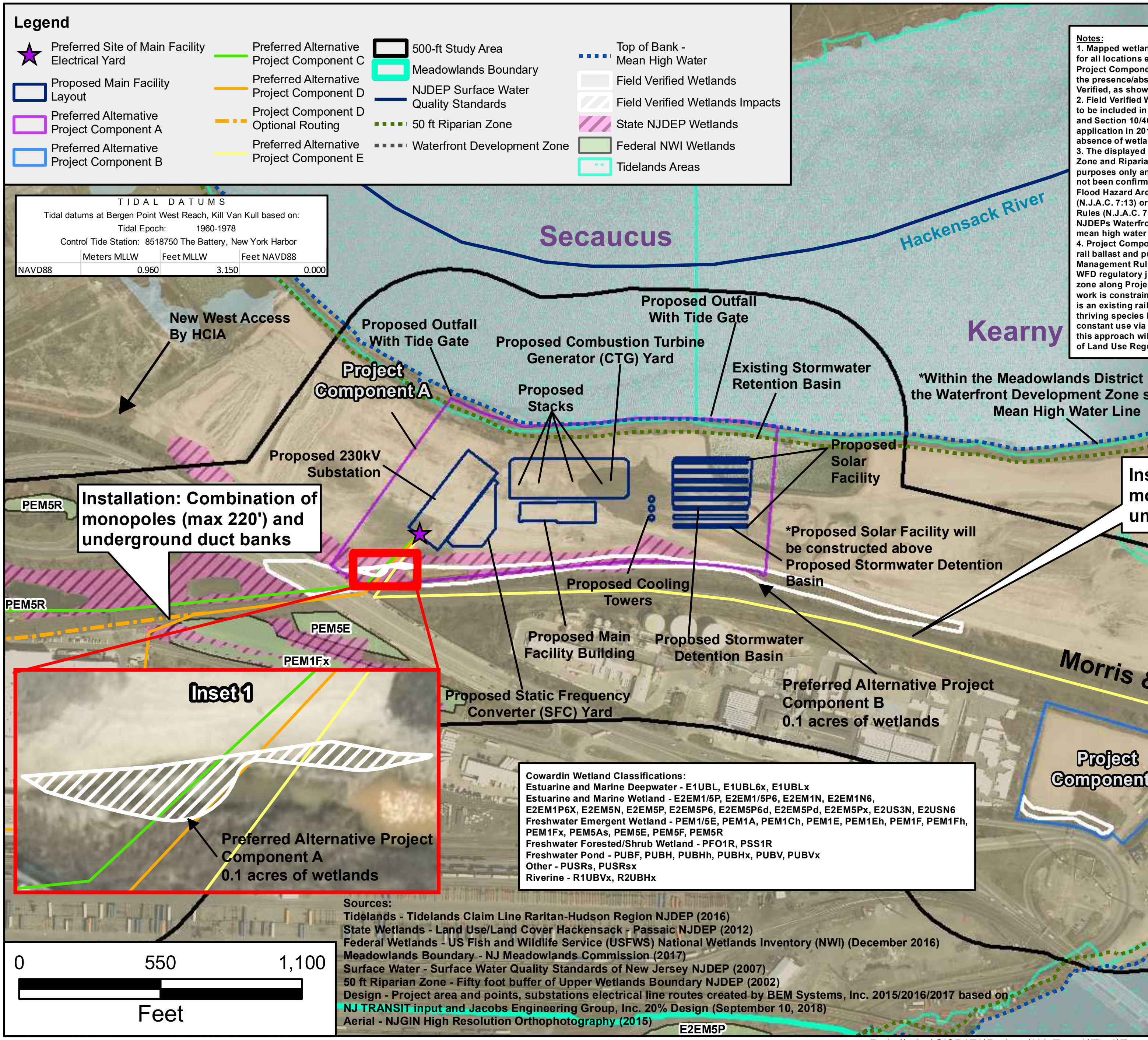

Figure 12-1: Wetlands and Streams Components A/B

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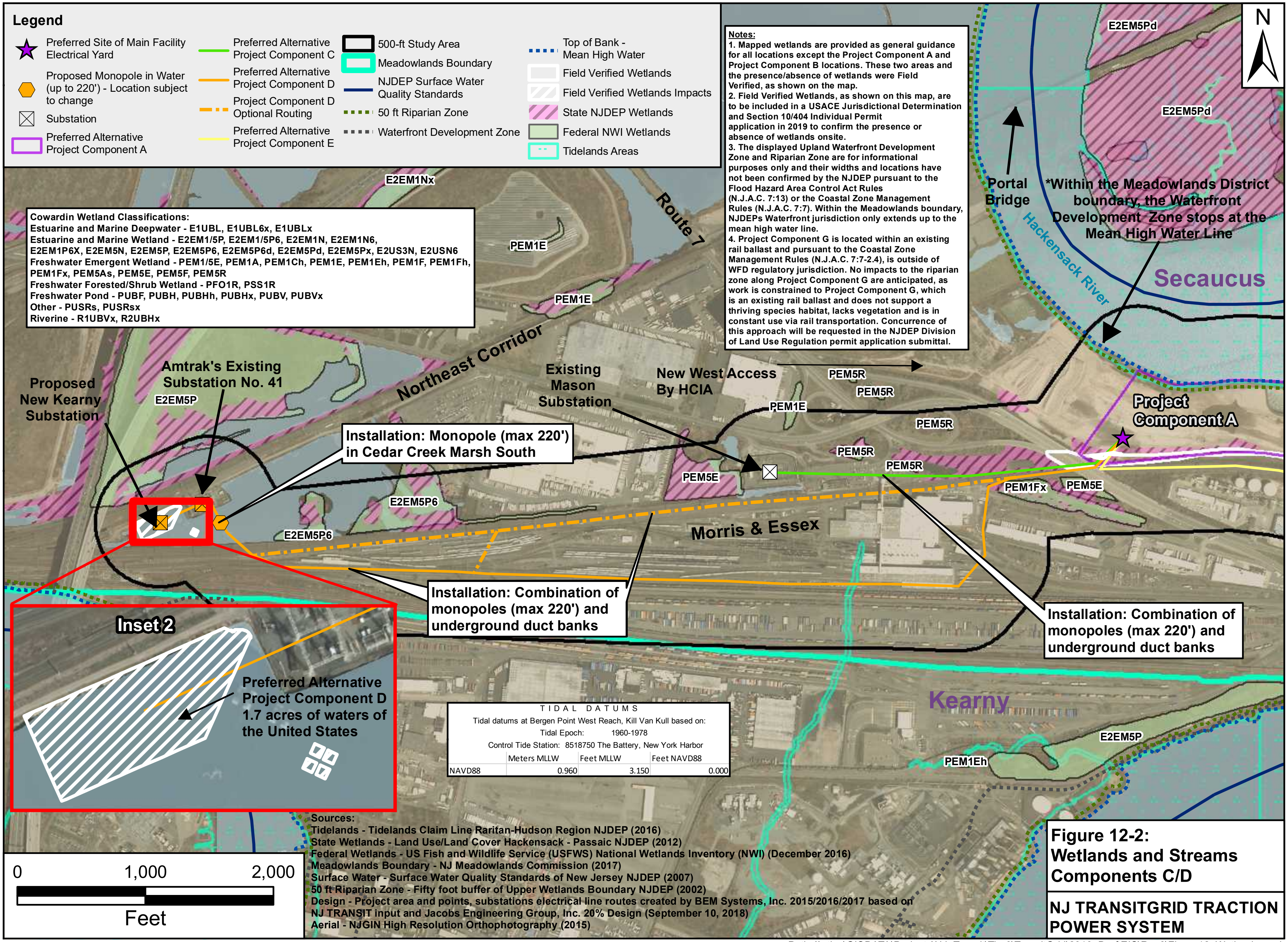

Figure 12-2: Wetlands and Streams Components C/D

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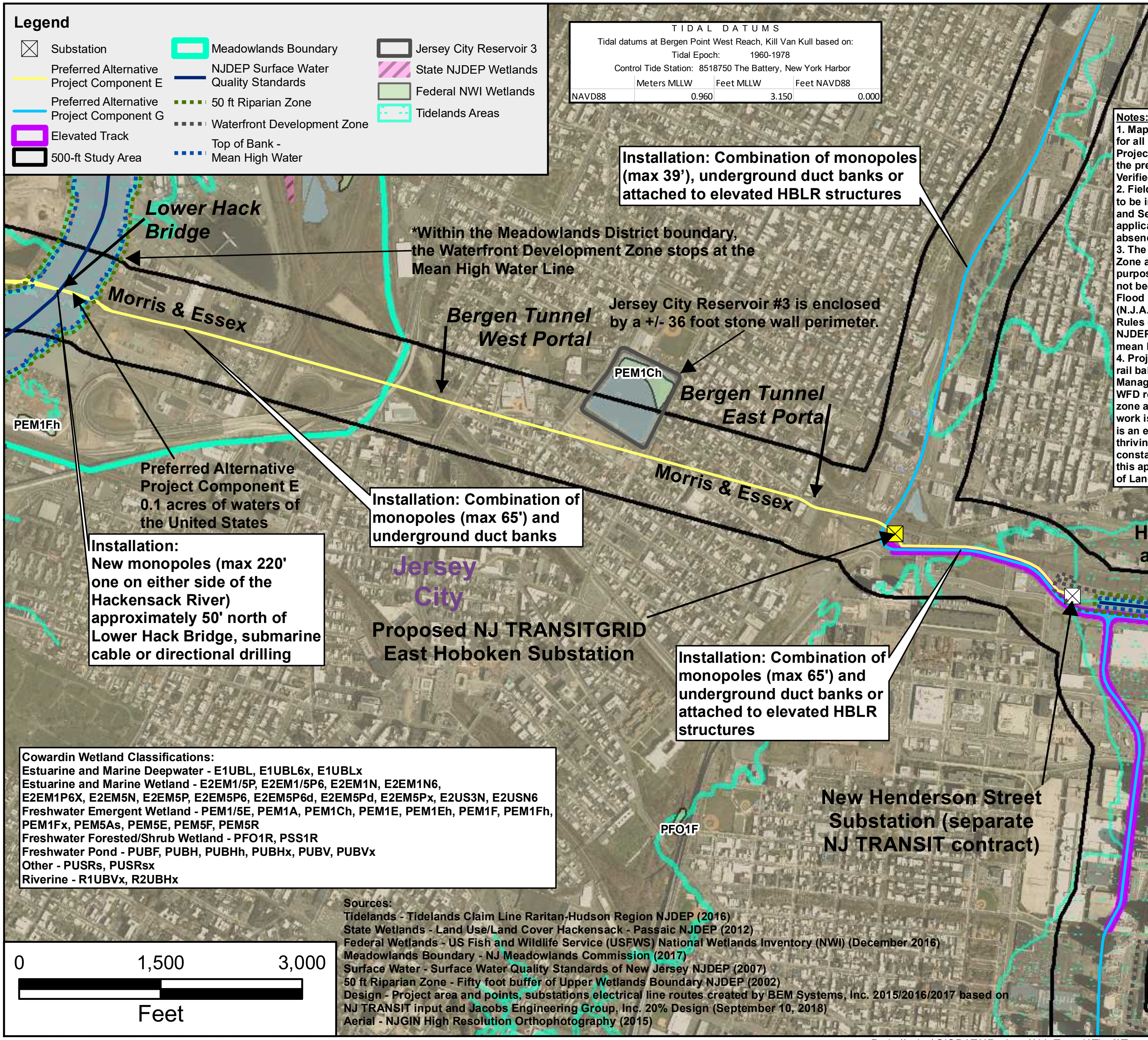

Figure 12-3: Wetlands and Streams Components E/G

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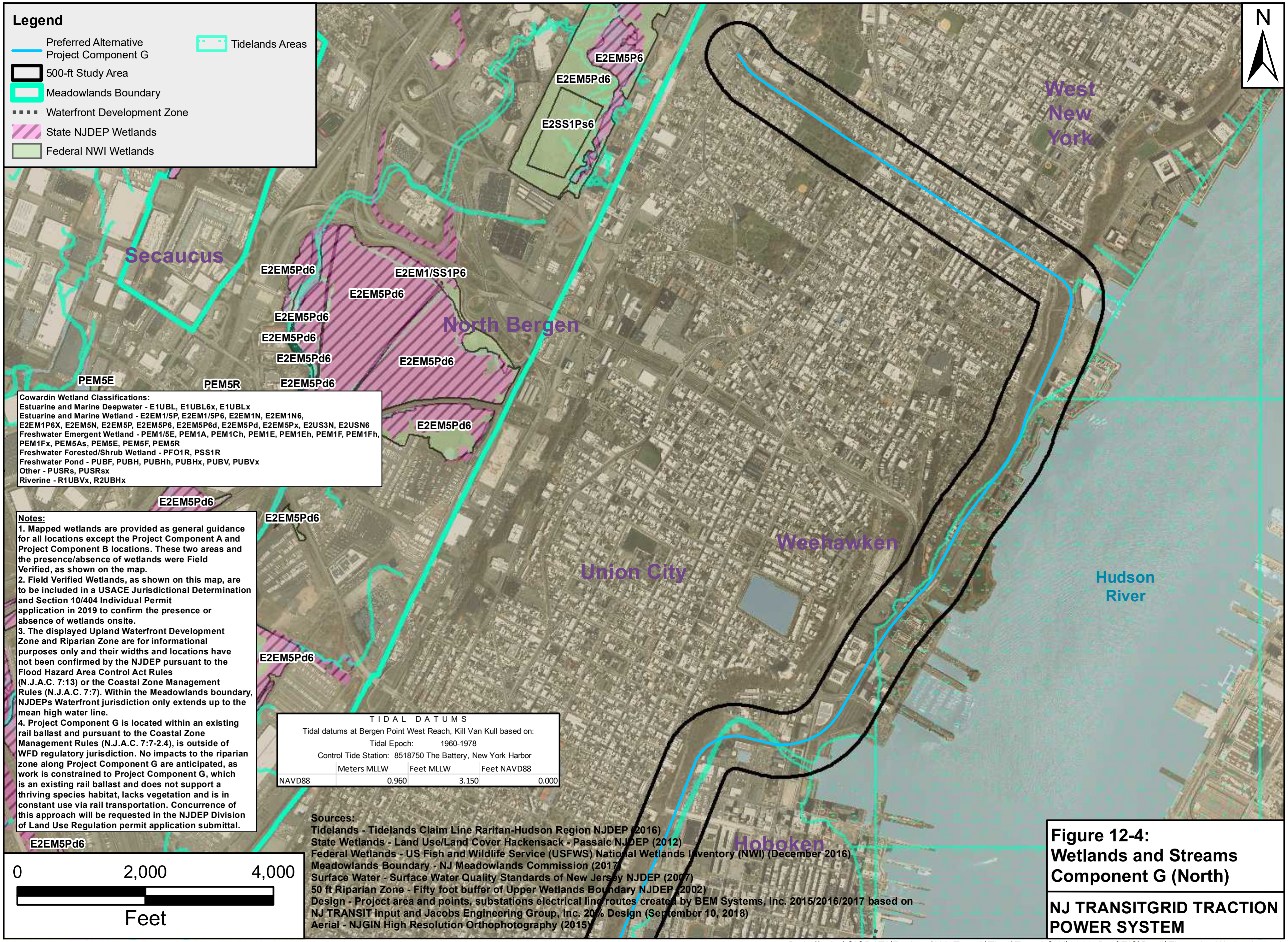

Notes:

1. Mapped wetlands are provided as general guidance for all locations except the Project Component A and Project Component B locations. These two areas and the presence/absence of wetlands were Field Verified, as shown on the map.
2. Field Verified Wetlands, as shown on this map, are to be included in a USACE Jurisdictional Determination and Section 10/404 Individual Permit application in 2019 to confirm the presence or absence of wetlands onsite.
3. The displayed Upland Waterfront Development Zone and Riparian Zone are for informational purposes only and their widths and locations have not been confirmed by the NJDEP pursuant to the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) or the Coastal Zone Management Rules (N.J.A.C. 7:7). Within the Meadowlands boundary, NJDEPs Waterfront jurisdiction only extends up to the mean high water line.
4. Project Component G is located within an existing rail ballast and pursuant to the Coastal Zone Management Rules (N.J.A.C. 7:7-2.4), is outside of WFD regulatory jurisdiction. No impacts to the riparian zone along Project Component G are anticipated, as work is constrained to Project Component G, which is an existing rail ballast and does not support a thriving species habitat, lacks vegetation and is in constant use via rail transportation. Concurrence of this approach will be requested in the NJDEP Division of Land Use Regulation permit application submittal.

TIDAL DATUMS

Tidal datums at Bergen Point West Reach, Kill Van Kull based on:
Tidal Epoch: 1960-1978
Control Tide Station: 8518750 The Battery, New York Harbor

	Meters MLLW	Feet MLLW	Feet NAVD88
NAVD88	0.960	3.150	0.000

Sources:
Tidelands - Tidelands Claim Line Raritan-Hudson Region NJDEP (2016)
State Wetlands - Land Use/Land Cover Hackensack - Passaic NJDEP (2012)
Federal Wetlands - US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (December 2016)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
Surface Water - Surface Water Quality Standards of New Jersey NJDEP (2007)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
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)

Figure 12-4: Wetlands and Streams Component G (North)

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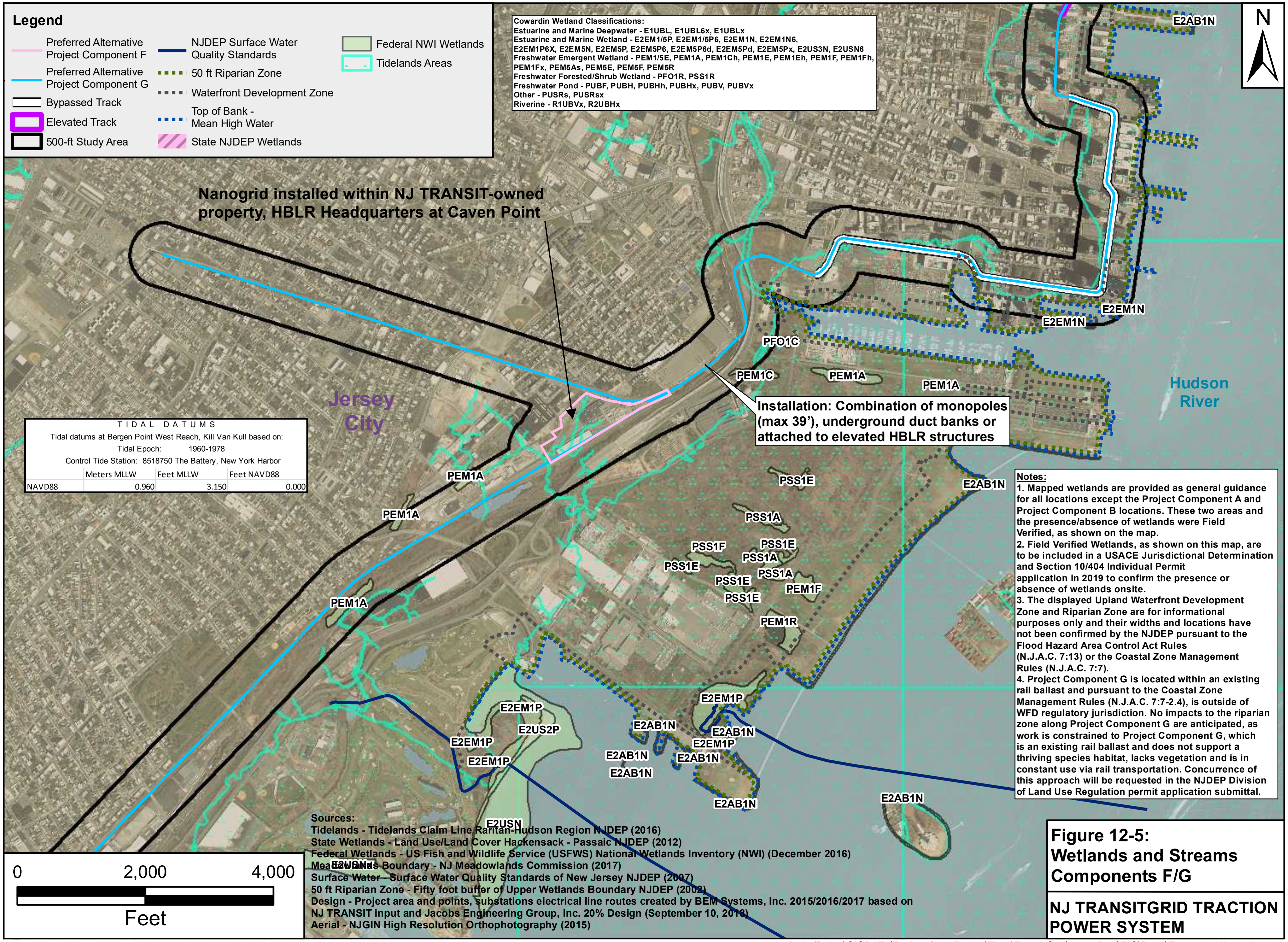

TIDAL DATUMS

Tidal datums at Bergen Point West Reach, Kill Van Kull based on:
Tidal Epoch: 1960-1978
Control Tide Station: 8518750 The Battery, New York Harbor

	Meters MLLW	Feet MLLW	Feet NAVD88
NAVD88	0.960	3.150	0.000

Notes:
1. Mapped wetlands are provided as general guidance for all locations except the Project Component A and Project Component B locations. These two areas and the presence/absence of wetlands were Field Verified, as shown on the map.
2. Field Verified Wetlands, as shown on this map, are to be included in a USACE Jurisdictional Determination and Section 10/404 Individual Permit application in 2019 to confirm the presence or absence of wetlands onsite.
3. The displayed Upland Waterfront Development Zone and Riparian Zone are for informational purposes only and their widths and locations have not been confirmed by the NJDEP pursuant to the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) or the Coastal Zone Management Rules (N.J.A.C. 7:7).
4. Project Component G is located within an existing rail ballast and pursuant to the Coastal Zone Management Rules (N.J.A.C. 7:7-2.4), is outside of WFD regulatory jurisdiction. No impacts to the riparian zone along Project Component G are anticipated, as work is constrained to Project Component G, which is an existing rail ballast and does not support a thriving species habitat, lacks vegetation and is in constant use via rail transportation. Concurrence of this approach will be requested in the NJDEP Division of Land Use Regulation permit application submittal.

Sources:
Tidelands - Tidelands Claim Line Raritan-Hudson Region NJDEP (2016)
State Wetlands - Land Use/Land Cover Hackensack - Passaic NJDEP (2012)
Federal Wetlands - US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (December 2016)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
Surface Water - Surface Water Quality Standards of New Jersey NJDEP (2007)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
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)

Figure 12-5: Wetlands and Streams Components F/G

NJ TRANSITGRID TRACTION POWER SYSTEM

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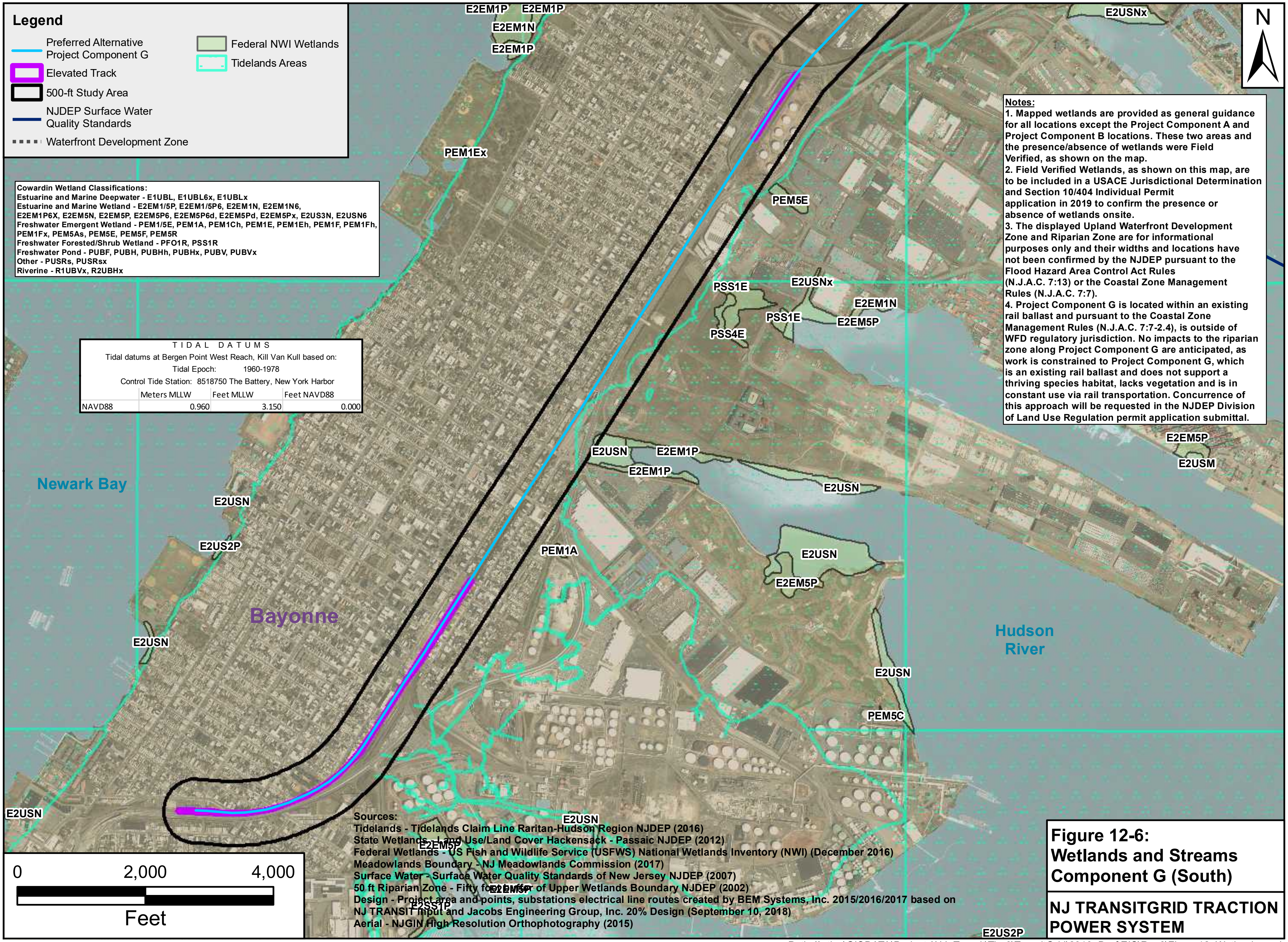

Figure 12-6: Wetlands and Streams Component G (South)

NJ TRANSITGRID TRACTION POWER SYSTEM

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because of their physical, chemical or biological characteristics, but are suitable for a wide variety of other fish species."

As discussed in 7 N.J.A.C. § 9B-1.12 [2016] (d and f), designated uses for SE1, SE2, and SE3 waters are qualified as follows:

(d) In all SE1 (Hackensack River) waters the designated uses are:

1. Shellfish harvesting;
2. Maintenance, migration and propagation of the natural and established biota;
3. Primary contact recreation; and
4. Any other reasonable uses.

(e) In all SE2 (Hudson River) waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;
2. Migration of diadromous fish;
3. Maintenance of wildlife;
4. Secondary contact recreation; and
5. Any other reasonable uses.

(f) In all SE3 (Passaic River) waters the designated uses are:

1. Secondary contact recreation;
2. Maintenance and migration of fish populations;
3. Migration of diadromous fish;
4. Maintenance of wildlife; and
5. Any other reasonable uses.

The Passaic River is located west of Amtrak's existing Substation No. 41 and is classified as a saline estuary, or SE3, whose designated uses are listed above and in 7 N.J.A.C. § 9B-1.12(f) [2016]. The anticipated Main Facility electrical yard connection point between Preferred Alternative Project Component A and the electrical lines of Preferred Alternative Project Components C, D, and E is located less than 500 feet to the south of the Hackensack River, which is directly adjacent to the northern boundary of Preferred Alternative Project Component A (Figure 12-1). The Hackensack River is also classified as a saline estuary, or SE1, by the NJDEP SWQS. Preferred Alternative Project Components E and F are located over 100 feet to the west of the Hudson River, which is classified by the NJDEP SWQS as freshwater non-trout (FW-

NT/SE2). The closest water course to Preferred Alternative Project Component G is the Hudson River, which falls within the study area in several areas along the HBLR corridor within Weehawken, Union City, Hoboken, and Jersey City.

As of 2016, 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). Regionally within the Meadowlands District there has been documentation of degraded water quality and exposure to endemic and transient (fish, crustaceans and macro-invertebrate) species, as noted in the study "Fish of the Hackensack Meadowlands (V. 3.0)," dated January 2005, which indicates the following contaminants were identified: heavy metals (arsenic, copper, zinc, lead, chromium, and mercury) and organic contaminants (PCBs, dioxins, furans, and pesticides).

Proceeding downstream as waters join with Newark Bay and the New York Harbor Estuary, these waters and tributaries have had a long history of industrialization along their shores, which continues to affect water quality as pollutants residing mostly in the sediments are dissolved and redistributed. In a tidally mixed water body, water exchange with the Atlantic Ocean tends to dilute waterborne contaminants, but the historically degraded sediments continue to provide new contaminants that affect water quality. Thus, the water quality of the system is coupled tightly to the quality of sediments but can also be affected by other sources (e.g., industrial discharges).

Sole Source Aquifer

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. Furthermore, based on previous remedial investigations conducted and reports summarizing the environmental database search prepared by Environmental Data Resources (EDR) of Shelton, Connecticut (EDR 2015, 2017, 2018a and 2018b) and further discussed in Chapter 14, "Contaminated Materials," depth to groundwater within the areas of Preferred Alternative Project Components A, B, C, D and the western portion of Preferred Alternative Project Component E, groundwater is 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 Preferred Alternative Project Component E, and all of Preferred Alternative Project Components F and G. Groundwater and management of construction activities near groundwater are further discussed in Chapters 13 and 17, respectively.

12.3.2 Floodplains, Riparian Zones, and Coastal Zone

Floodplains

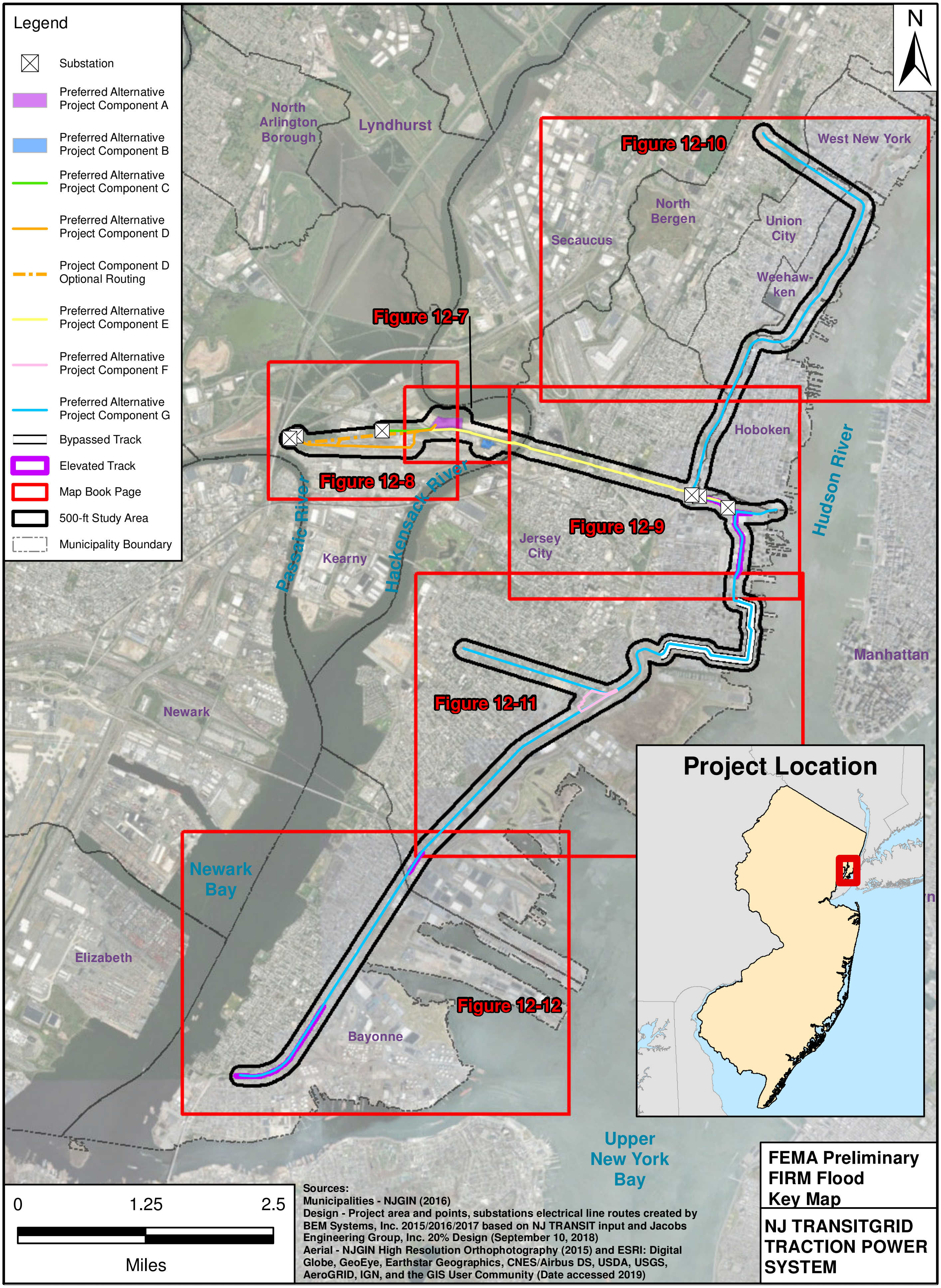
The current FEMA FIRMs identify the majority of the study area to be within the tidally influenced 100-year floodplain associated with the Passaic River, Hackensack River and Hudson River, with the Base Food Elevation (BFE) ranging from +9 to +16 feet North American Vertical Datum of 1988 (NAVD88), within Zones AE and VE (see Figures 12-7 through 12-12). Areas mapped by FEMA as Zone AE are subject to inundation by the one-percent-annual-chance flood coastal surge event determined by detailed methods. Areas mapped as Zone VE are subject to the same inundation by the one-percent-annual-chance flood coastal surge event but are also subject to hazardous wave conditions.

Preferred Alternative Project Components A, B, C, and D are located within the 100-year floodplain of the Passaic and Hackensack Rivers with BFEs of +9 and +10 feet (NAVD88), Zone AE (Figure 12-7 and 12-8) with minor portions being mapped outside the floodplain, to the east of the Main Facility. Preferred Alternative Project Component E is primarily outside of the floodplain, with the exception of where the electrical line route crosses the Hackensack River (BFE of +10 feet NAVD88, Zone AE), and to the east, where the electrical lines will connect with the Henderson Street Substation in Hoboken Yard (BFEs of +10 and +11 feet NAVD88, Zone AE) (see figures 12-7, 12-8 and 12-9). Preferred Alternative Project Component F, the emergency generators at HBLR Headquarters, is in Zone AE with BFE of +11 feet. Preferred Alternative Project Component G is primarily within the floodplain of the Hudson River (Figures 12-11 and 12-12), and is located within Zone AE, with BFEs of +10, +11, and +12 feet (NAVD88).

Riparian Zones

Riparian zones are land areas adjacent to streams/water bodies that provide a protective buffer, filtration of surface runoff that flows into streams, serve as a functional habitat and wildlife corridor, and are vital for maintaining water quality and a stream's capacity to support aquatic life. The width of the riparian zone associated with a specific stream is determined by the NJDEP FHA Rules (7 N.J.A.C. § 13-4 [2018]), based on the stream's NJDEP SWQS classification and associated known species utilization/habitat information surrounding the stream, and are either 50, 150 or 300 feet wide, as outlined by the NJDEP FHA Rules.

All Project Components are located over 300 feet away from the Passaic River, and therefore, are not located within the Passaic River's riparian zone. The closest is Project Component D, which is more than 600 feet away. The riparian zone associated with the Hackensack River is 50 feet (Figures 12-1 and 12-2). The northern boundary of Preferred Alternative Project Component A is located within the 50-foot riparian zone, which at this location is partially vegetated with invasive/non-native plant species common to disturbed areas. The remaining portion of the riparian zone at this location is comprised of processed dredge material (PDM) fill from previous property-wide remedial fill activities. Preferred Alternative Project Components B, C, and D are not located within a riparian zone associated with the Hackensack River. Project Component E will intersect the 50-foot riparian zone of the Hackensack River where the electrical line route is proposed to cross the Hackensack River, via one of three methods: an aerial crossing



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)

FEMA Preliminary FIRM Flood Key Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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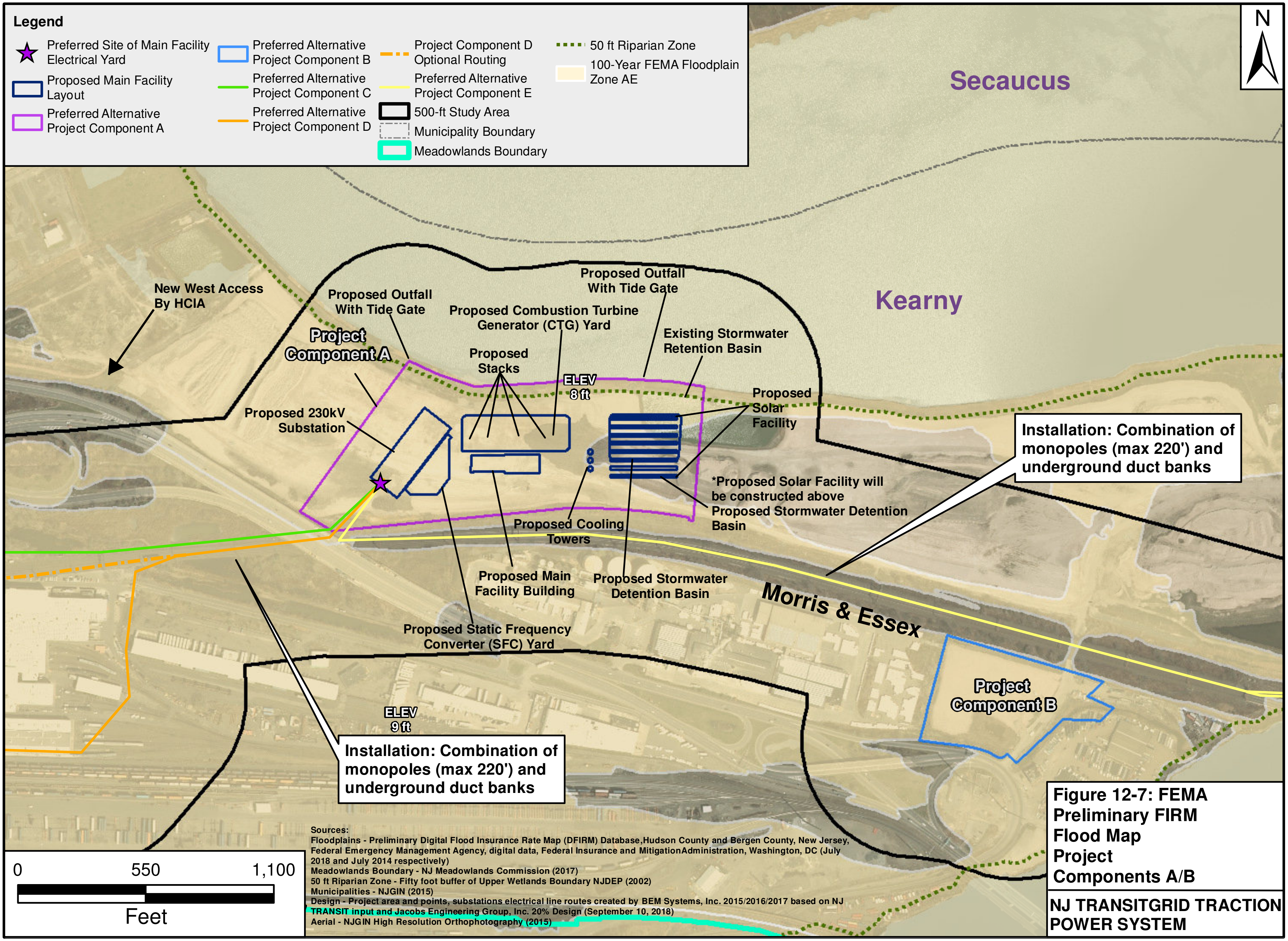

Figure 12-7: FEMA Preliminary FIRM Flood Map Project Components A/B

NJ TRANSITGRID TRACTION POWER SYSTEM

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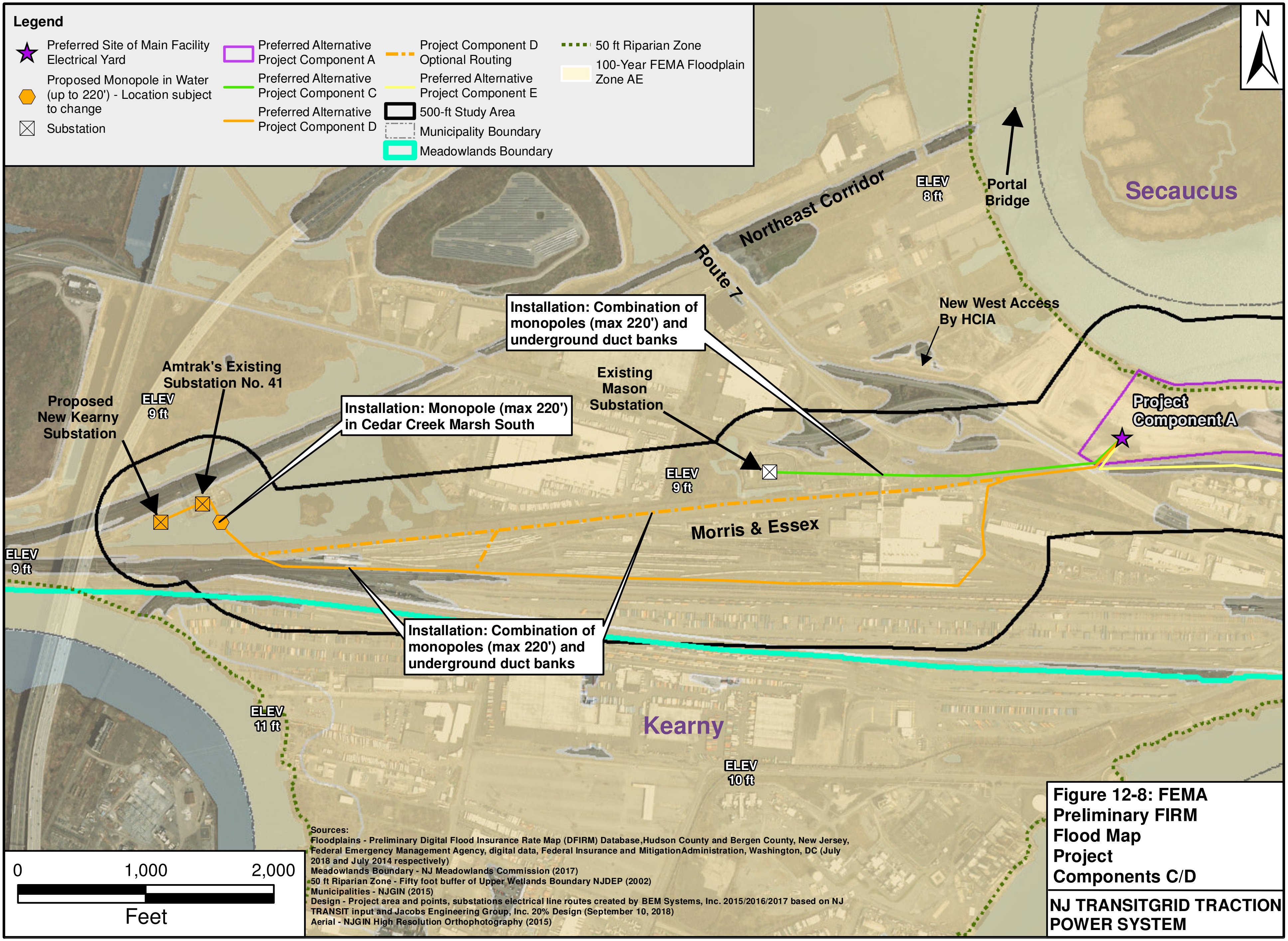

Figure 12-8: FEMA Preliminary FIRM Flood Map Project Components C/D

NJ TRANSITGRID TRACTION POWER SYSTEM

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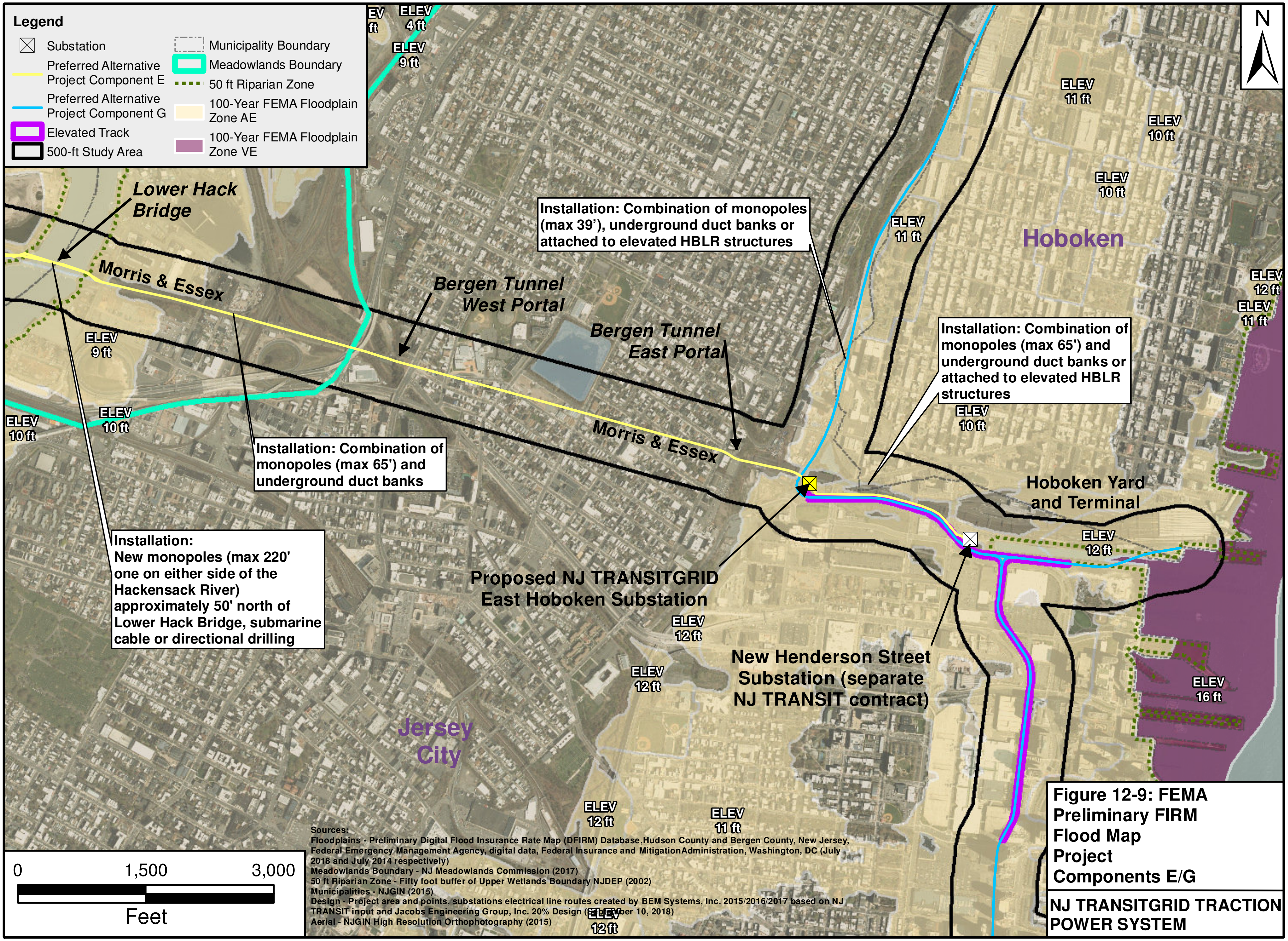

Figure 12-9: FEMA Preliminary FIRM Flood Map Project Components E/G

NJ TRANSITGRID TRACTION POWER SYSTEM

Sources:
Floodplains - Preliminary Digital Flood Insurance Rate Map (DFIRM) Database,Hudson County and Bergen County, New Jersey, Federal Emergency Management Agency, digital data, Federal Insurance and MitigationAdministration, Washington, DC (July 2018 and July 2014 respectively)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
Municipalities - NJGIN (2015)
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)

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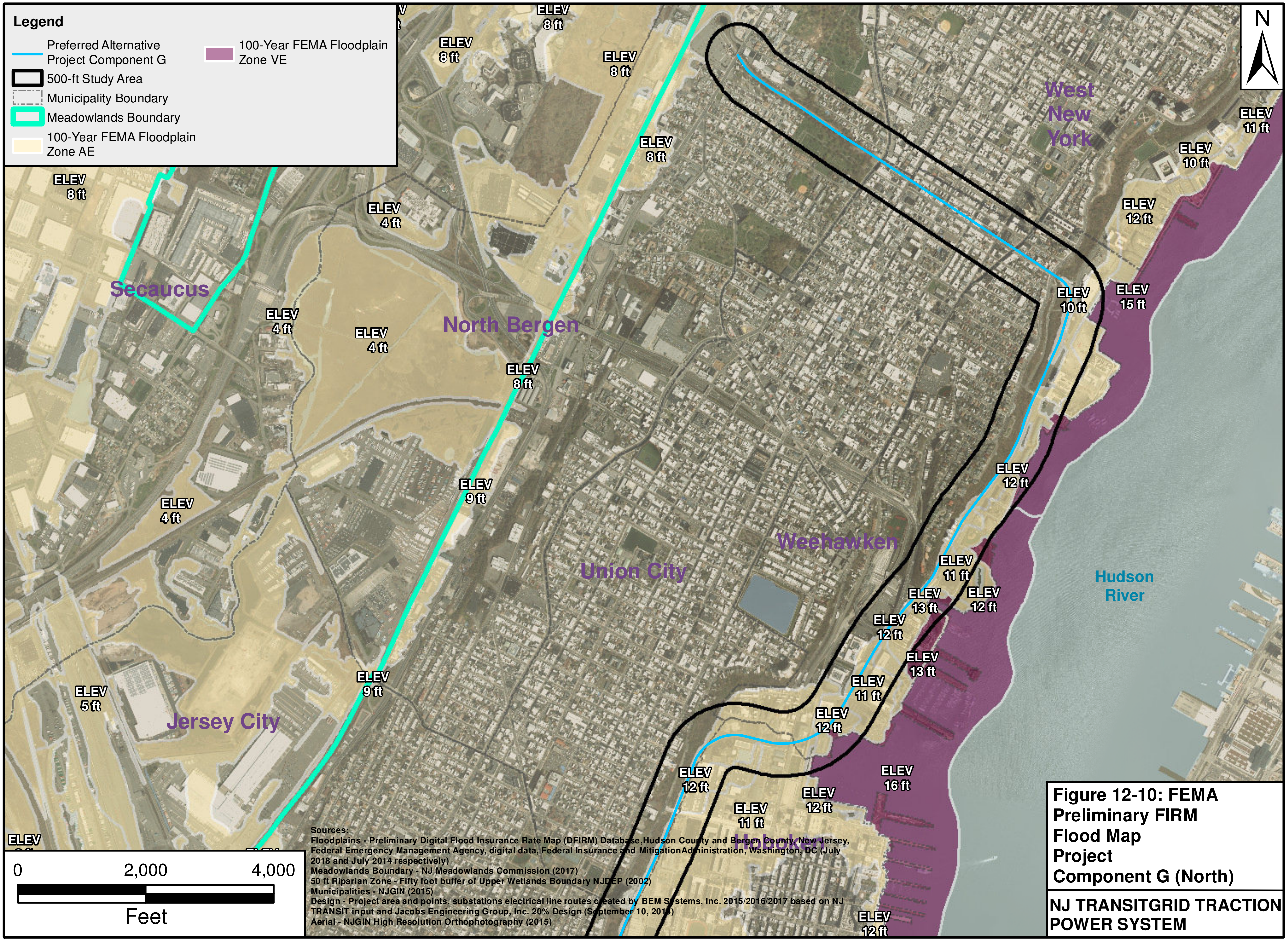

Figure 12-10: FEMA Preliminary FIRM Flood Map Project Component G (North)

NJ TRANSITGRID TRACTION POWER SYSTEM

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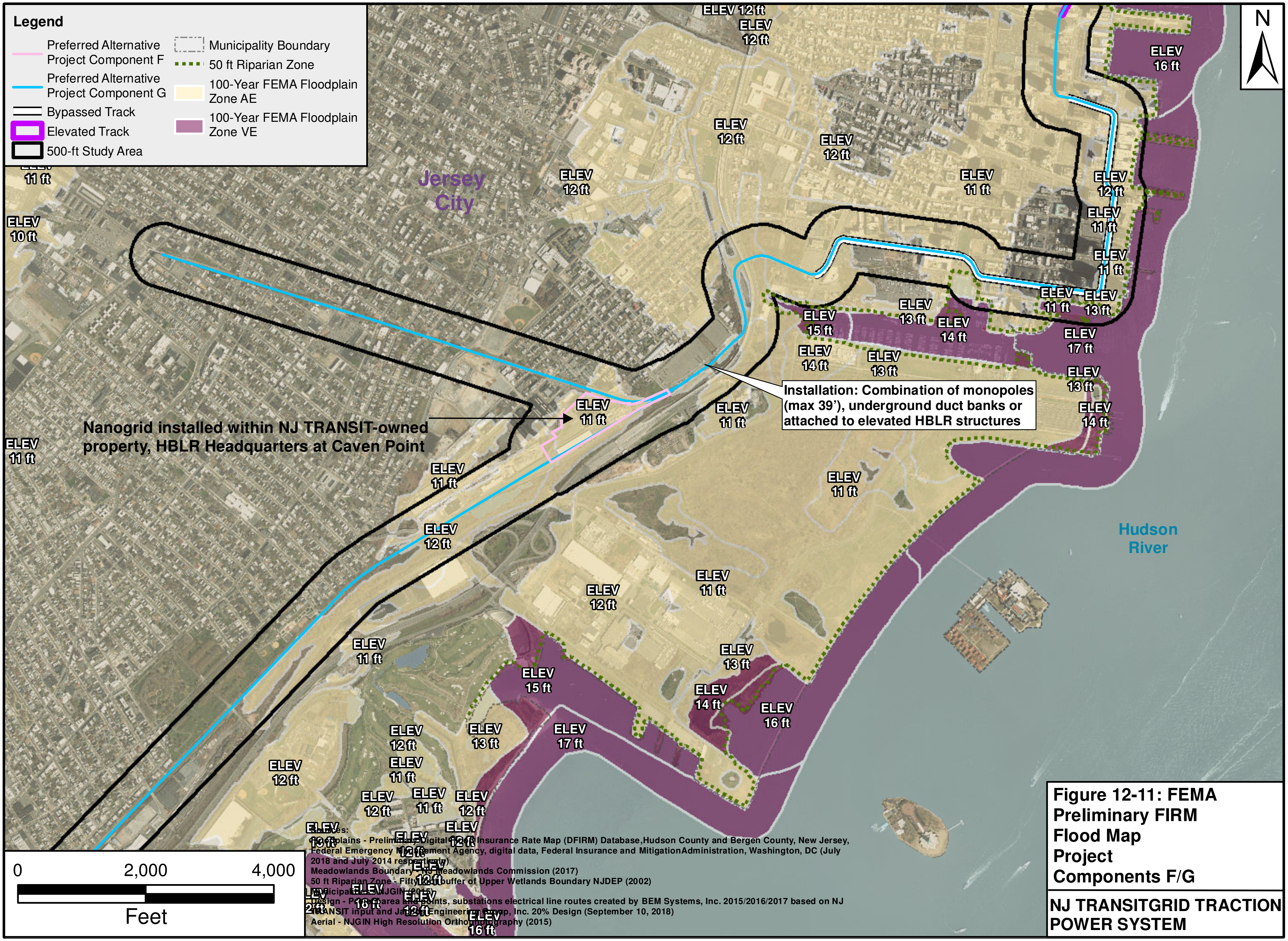

Sources:
Floodplains - Preliminary Digital Flood Insurance Rate Map (DFIRM) Database,Hudson County and Bergen County, New Jersey, Federal Emergency Management Agency, digital data, Federal Insurance and MitigationAdministration, Washington, DC (July 2018 and July 2014 respectively)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
Municipalities - NJGIN (2015)
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)

Figure 12-11: FEMA Preliminary FIRM Flood Map Project Components F/G

NJ TRANSITGRID TRACTION POWER SYSTEM

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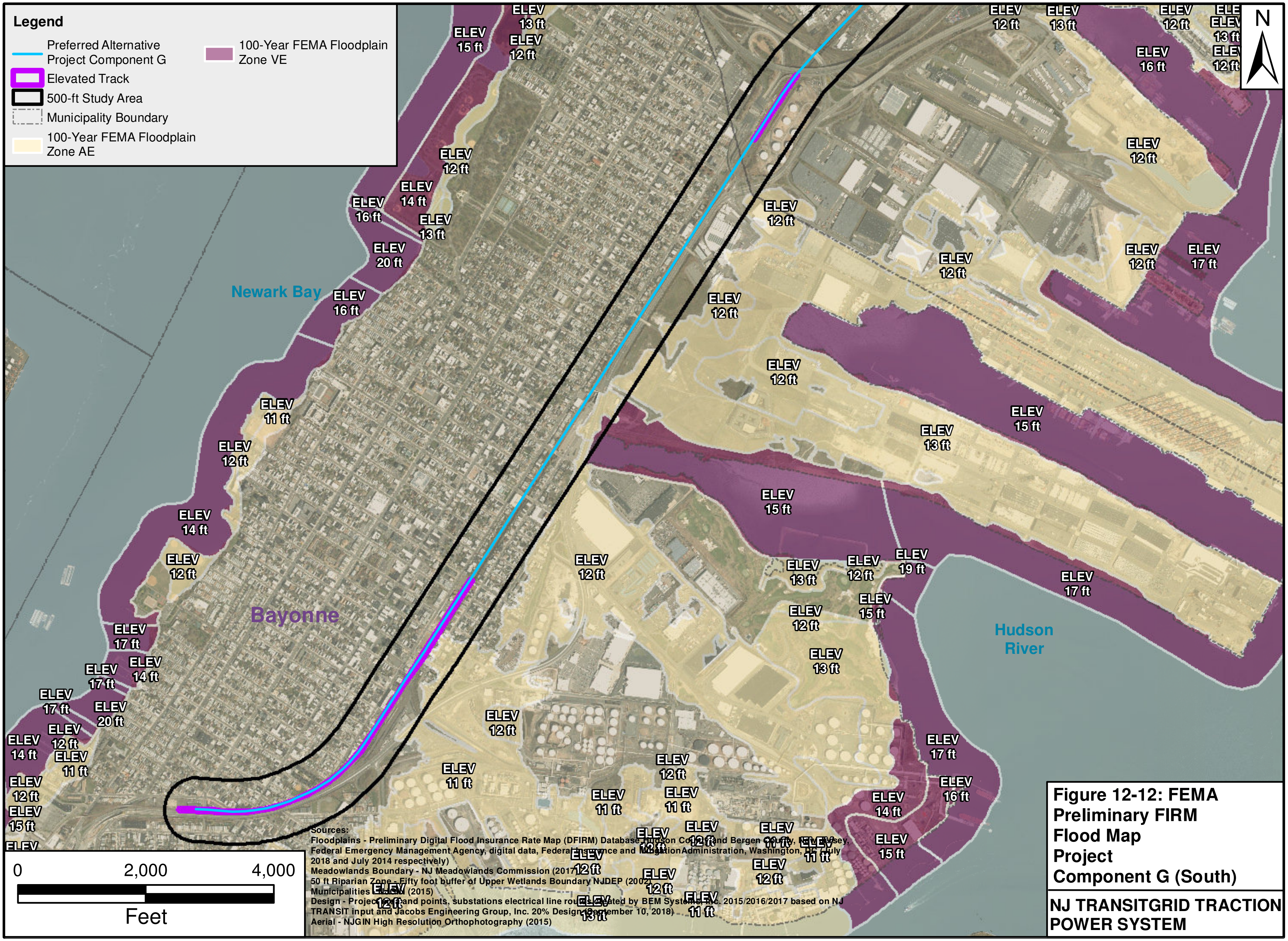

Sources:
Floodplains - Preliminary Digital Flood Insurance Rate Map (DFIRM) Database Hudson County and Bergen County, New Jersey, Federal Emergency Management Agency, digital data, Federal Insurance and Mitigation Administration, Washington, DC (July 2018 and July 2014 respectively)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
Municipalities - NJGIN (2015)
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)

Figure 12-12: FEMA Preliminary FIRM Flood Map Project Component G (South)

NJ TRANSITGRID TRACTION POWER SYSTEM

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on new monopoles 50 feet north of the Lower Hack Bridge (preferred option), through a submarine cable laid along the river bottom, or directionally drilled[15] underneath the river bed. Nevertheless, it is noted that at this location, the riparian zone is primarily developed by the existing Morris & Essex Line and associated rail right-of-way.

The riparian zone associated with the Hudson River is also 50 feet (Figures 12-3 and 12-5). Preferred Alternative Project Component G is the closest to this highly developed riparian zone. However, no vegetation is located where the proposed electrical lines and new utility poles are anticipated to be installed and operated within the existing HBLR right-of-way. Preferred Alternative Project Components E and F do not intersect the Hudson River's 50-foot riparian zone.

Coastal Zone

Waterfront Development

As outlined in the NJDEP's Coastal Zone Management Rules (7 N.J.A.C. § 7-2.4 [2019]), the Upland WFD Zone (waterfront regulated areas landward of the mean high-water line up to a maximum of 500 feet, or at the first paved parallel public road, railroad or surveyable property line) does not exist within the Meadowlands District Boundaries (Figures 12-1 through 12-6). However, the In-Water WFD Zone does exist, areas waterward from the mean high tide line. Any activities proposed within this area are required to be reviewed by the NJDEP under a Waterfront Development Permit application, demonstrating compliance with the NJDEP's Coastal Zone Management Rules at 7 N.J.A.C. § 7 [2019]. The only portion of the Project that will impact the In-Water WFD Zone are the stormwater improvements-proposed outfalls required under Preferred Alternative Project Component A and the submarine cable for Project Component E (if this non-preferred alternative is selected).

For areas outside of the Meadowlands District Boundary, the Upland WFD Zone ceases after either 500 feet landward of the mean high water (MHW) line, or at the first paved parallel public road, railroad or surveyable property line (Figures 12-1 through 12-6). Any activities proposed within this area are required to be reviewed by the NJDEP under a Waterfront Development Permit application, demonstrating compliance with the NJDEP's Coastal Zone Management Rules at 7 N.J.A.C. § 7 [2019].

Tidelands Areas

In addition to the WFD Zone, the NJDEP also regulates Tidelands areas. Tidelands are currently, or formerly flowed areas that are owned by the state of New Jersey. Since Tidelands are public lands, written permission must be obtained from the state, and a fee is required to use these lands. Common uses of tidelands include docks, mooring piles, bulkheads and other fill materials. Some tidelands may be

[15] Directional drilling is a process that allows for trenchless construction across an area—a borehole is drilled under the area and a prefabricated segment of pipe is installed through the borehole, thereby avoiding direct disturbance to the surface. It is commonly used to cross underneath sensitive or difficult to construct areas such as those with slope stability issues, roads, wetlands, and water bodies.

conveyed by payment of a yearly license fee or one standard grant fee in the form of a Tidelands Grant while others may only be rented through either a Tidelands License or Lease.

Preferred Alternative Project Components A, E, F, and G intersect Tidelands areas (Figures 12-1, 12-3 through 12-6). Preferred Alternative Project Components A, E, F and G have been issued Tidelands Grants, authorizing some work within the Tidelands area, as indicated in Table 12-1 (see Appendix D, "Agency Correspondence"). This step of assuring "Tidelands ownership," is addressed under further advanced design via regulatory Land Use permit submission and project review with the NJDEP Bureau of Tidelands. The NJDEP Bureau of Tidelands issues short-term Tidelands Interim Licenses to adhere to project construction timeframes but are only valid for a limited amount of years, as well as Tidelands Grants, which are permanent but have multi-year technical review and authorization time frame.

Table 12-1 NJDEP Bureau of Tidelands Instruments by Project Component

Project Component	Tidelands Present or Absent	NJDEP Tidelands Instrument Issued / Instrument Required?
Preferred Alternative Project Component A	Present	Grant – November 7, 1990, Hudson County Improvement Authority, Kearny Block 287 Lot 61.03
		Grant – December 1, 1936, Koppers Company, Kearny Block 287 Lot 62
		Grant – Seaboard By-Product by Coke Company, December 16, 1929, Kearny Block 287 Lot 62.01
Preferred Alternative Project Component B	Absent	-
Preferred Alternative Project Component C	Absent	-
Preferred Alternative Project Component D	Absent	-
Preferred Alternative Project Component E	Present	Grant – June 17, 2008, Millennium Towers, LLC, Jersey City Block 6002 Lot 7
		Grant – January 21, 1924 Morris and Essex R.R. Company, Jersey City Block 7402 Lot 19
Preferred Alternative Project Component F	Present	Grant - March 1992, Rudolph Ball, INC, Jersey City Block 21503 Lots 2, 35, 41, 42, 44
Preferred Alternative Project Component G	Present	Grant - July 10, 1886, Delaware and Hudson Canal Company, Weehawken, Block 34.03 Lot 6
		Grant - September 20, 1879, The Delaware and Hudson Canal Company, Weehawken, Block 36.04, Lots 2, 2.01 and 2.02
		Grant - March 30, 1836, United Railroad and Canal Companies Jersey City, Block 7303, Lots 5.4, 6, 9, 10, 11 and 12
		Grant - November 12, 1874, Central Railroad of New Jersey, Jersey City, Block 15801 Lots 7, 14 and 81
		Grant - November 12, 1874, Central Railroad of New Jersey, Jersey City, Block 15901 Lot 14 and 16
		Grant - April 14, 1888, Morris and Essex R. R. Company, Jersey City, Block 7301 Lots 1 and 5
		Grant - March 30, 1868, United Railroad and Canal Companies, Jersey City, Block 11603 Lots 28, 31, 32, 40, and 45-48

12.3.3 Tidal and Freshwater Wetlands

Amongst various functions and values, wetland resources have the potential or are documented to provide specific benefits to wildlife, human life and property. Wetlands can act as a first defense natural buffer between inland areas and adjacent waterbodies from flooding and storm surges, but also provide water quality filtration and Total Suspended Solid (TSS) removal, in addition to supplying evident habitat and life stage functions for multiple species. Wetlands also act as a natural soil stabilization agent during storm events, protecting shorelines from harsh storm flows and dynamic wave action. To perform this function, wetlands adjacent to major rivers, lakes or coastal oceans must be large in size, and uninterrupted by development. Wetlands of a fragmented nature, or disjointed from larger wetland systems, do not perform this function adequately, as they are limited by their water or flood storage capacity and ability to adequately filter particulates during precipitation events.

Assessment and field verification of wetland resources, type and geographic location within the proposed Project area are generally summarized below and are presented in the Wetland Delineation Report (see Appendix E, “Wetland Delineation Report”). The wetland analysis as discussed in this report was based on review of previous confirmed wetland delineations-Jurisdictional Determinations (JD), state and federal publicly available wetland mapping websites, 2016 and 2017 field wetland delineation efforts, and photo documentation of areas with characteristic wetland or upland vegetation for active NJ TRANSIT rail corridors where accessibility was limited. It is noted that the Project area predominately utilizes an existing ballasts-developed rail corridor and therefore is mostly devoid of wetlands resources. Any deviations from the main rail corridor and identified resources are presented below.

Preferred Alternative Project Components A, B, C, D, and a portion of E are located within the Meadowlands District-NJSEA boundary (Figures 12-1 to 12-3), which encompasses former landfill areas, redeveloped areas and an approximate 8,400 acre wetland preservation area with tidal and freshwater wetland areas, monitored by the NJSEA, which consists of multiple wetland complexes spread throughout 14 municipalities and includes restored wetland areas to the north, and closer designated resources such as the Riverbend Wetland Preserve, the Kearny Brackish Marsh and Cedar Creek Marsh (North and South).

Preferred Alternative Project Components A (Main Facility) and B (Six-acre Parcel)

On April 21st, July 2nd and September 16th, 2016, wetland scientists on behalf of NJ TRANSIT completed field investigations of the Main Facility (Preferred Alternative Project Component A) and the six-acre parcel (Preferred Alternative Project Component B). This included a walk-through of the properties and delineating remnant wetlands along the south edge of Preferred Alternative Project Component A and the southwestern portion of Preferred Alternative Project Component B. The field investigation and delineation tasks were completed pursuant to the USACE’s Wetland Delineation Manual of 1987, which requires the evaluation of onsite hydrology, vegetation and soil characteristics present at the time of delineation, to accurately determine the location and limits of wetlands.

Two fragmented wetland areas, totaling 3.53 acres of inland freshwater wetlands in proximity of Preferred Alternative Project Components A and B were field-verified as shown on Figure 12-1, and in Appendix E, “Wetland Delineation Report.” These are primarily remnant stormwater drainage ditches that are hydrologically connected to adjacent wetlands via stormwater conveyance features and are comprised of dense non-native common reed.

The southwestern wetland near Preferred Alternative Project Component A is a vegetated area with standing water, located between the existing Morris & Essex Line tracks and the onsite PDM fill material. A portion of this area was mapped by NJDEP (Figure 12-1) to contain inland freshwater wetlands. Wetland scientists delineated 3.27 acres of wetland resources along the south edge of Preferred Alternative Project Component A. During field investigation activities, a silt fence was observed at the toe of slope, demarking that those areas were being protected from filling actions onsite.

Preferred Alternative Project Component B is located to the southeast of Preferred Alternative Project Component A, across the Morris & Essex Line and adjacent to Fish House Road. As within Preferred Alternative Project Component A, Preferred Alternative Project Component B was elevated from original grade using PDM fill material. Although historic aerials do not show wetlands to be present onsite prior to the placement of fill, wetland characteristics have developed within underlying drainage areas. Wetland scientists delineated 0.26 acres of fragmented wetland environment within Preferred Alternative Project Component B as shown on Figure 12-1.

The field-verified freshwater wetlands near Preferred Alternative Project Components A and B have a low resource value, as they are disturbed, fragmented resources, located within a Brownfields redeveloped area. They adjoin a developed rail corridor and are hydrologically isolated from the Hackensack River and any other wetland or water feature. The wetland areas are vegetated by invasive monocultures of common reed, and do not significantly contribute to wildlife function, mobilization or provide suitable habitat for foraging, shelter, or breeding of avian or terrestrial species.

Although these features are remnant and provide limited wildlife value, these onsite wetlands generally serve limited function as a natural protective barrier for inland areas against floodwaters, provide flood storage capacity, and provide a natural filtration medium that intercepts surface runoff and drainage waters prior to discharging to the adjoining Hackensack River or infiltrating into groundwater. These wetlands help limit erosion and deposition into receiving waters from soil migration and potential water quality impacts. Specifically, the field-verified wetland area where the Main Facility is proposed serves as a stormwater collection area, which connects with the Hackensack River via groundwater infiltration or conveying stormwater pipes. As these field-verified wetland areas are considered isolated from the surrounding Meadowlands wetland complex to the north, the area’s natural capacity to hold and filter runoff sediments and debris that could enter the Hackensack River is limited.

Preferred Alternative Project Components C and D

A segment of Preferred Alternative Project Components C and D connect with Preferred Alternative Project Component A and will cross the delineated freshwater wetlands, previously discussed. Field verification of wetlands also confirmed that the remaining improvements associated with Preferred Alternative Project Component C are located within the existing Morris & Essex Line right-of-way and do not traverse wetland resources.

Cedar Creek Marsh South is located at the western terminus of the electric line route near Amtrak’s existing Substation No. 41 (see Figure 12-2). Cedar Creek Marsh has been historically bisected through the construction of roadways and railroads which function as hydrologic barriers and physically restrict movement of the waters from the nearby wetland areas and the tidal Hackensack River. This area, however, is still hydrologically connected to the Hackensack River via engineered pipes to adjoining isolated wetlands, but tidal inputs are restricted by raised elevations and installed tide gates to the west, south and east. Cedar Creek Marsh South is also hydrologically maintained to minimize flooding to rail infrastructure by an existing pump station. This isolation and the established active rail corridors that surround it reduce the function and value of the resource to endemic wildlife due to the flow restrictions that prevent aquatic species ingress and egress relative to the large, hydrologically-connected, tidally-influenced nursery areas of the wetlands of the Meadowlands District. The National Wetlands Inventory (NWI) identifies Cedar Creek Marsh South as estuarine wetlands, with the majority of the area classified as estuarine deep-water habitat, with the easternmost portion identified as estuarine, intertidal, emergent *Phragmites*-dominated marsh. Currently, Cedar Creek Marsh South is primarily an open water resource, with shrub and emergent vegetation limited to the minor landmasses within the marsh and along the perimeter.

Amtrak's existing Substation No. 41 is located within Cedar Creek Marsh South and is connected to multiple utility lines crossing the water body. Additionally, multiple utility towers have been placed within the marsh to energize Amtrak's Substation No. 41 and portions of the Northeast Corridor. Preferred Alternative Project Component D will involve construction of a concrete platform on piers covering up to 1.7 acres of open water and marsh for the new Kearny Substation platform (which the USACE treats as a "fill" taking) and for the installation of a maximum 220-foot-high monopole in Cedar Creek Marsh South (see Figure 12-2).

Wetlands/waters of Cedar Creek Marsh South have a very limited vegetative edge to provide filtration benefits to the receiving Cedar Creek Marsh South and function more as a storage "detention pond" for waters and settlement of soils. This storage capacity serves to protect adjoining inland areas by retaining rain or momentary surge waters and provides minimal habitat function or benefits to limit erosional inputs to adjoining areas. In 2009, a Wetland Delineation Report was prepared for the Portal Bridge Capacity Enhancement Project for NJ TRANSIT, which included a review of wetlands/waters in Cedar Creek Marsh South. The report was then submitted to the USACE and wetland/water limits were confirmed via a USACE JD (File No. NAN-2009-012220W CA). As wetland/water resources in Cedar Creek Marsh South were already jurisdictionally confirmed by the USACE, and no development change has occurred to change the extent of wetland resources, and the fact that it is a highly active rail corridor, it was determined that no field analysis or further review would be required to define wetland/waters in Cedar Creek Marsh South.

Preferred Alternative Project Components E and F

A segment of Preferred Alternative Project Component E connects with Preferred Alternative Project Component A and will cross the delineated freshwater wetlands that were previously discussed. Preferred Alternative Project Component E will also cross the Hackensack River, which is classified as waters of the United States by CWA Definitions (40 C.F.R. § 230.3 [1972]), as it is subject to the ebb and flow of the tide, activities proposed in the Hackensack River will be subject to dual jurisdiction of the USACE and NJDEP. Activities proposed in inland freshwater wetlands within the Meadowlands District will fall under jurisdiction of the USACE only.

No shoreline wetland areas were identified along the Hackensack River at this location, as the shores are primarily comprised of developed asphalt and gravel lined areas. Based on review of NJDEP Submerged

Aquatic Vegetation (SAV) maps there are no recorded detailed maps for this area of the state or the Hackensack River. The NJDEP does not identify freshwater wetlands at this location, and the NWI Wetland Mapper does not identify wetlands along the banks of the Hackensack River at this location (see Figure 12-3). Additionally, during the 2016 field delineation, no wetland resources were observed at the location of the Hackensack crossing area, both directly adjacent to the Hackensack River, or upland of the River. Field observations did not confirm the presence of SAV establishment in waters. Impacts to the shoreline of the Hackensack River will be avoided by utilizing new monopoles installed approximately 50 feet north of the Lower Hack Bridge, or through directional drilling if the selected installation option for the Hackensack River crossing is a submarine cable along the river bed or drilled beneath the river bottom.

NJDEP Land Use/ Land Cover and review of the USFWS NWI Wetlands Mapper data layers do not identify wetland areas within the portion of the proposed electrical line routes east of the Hackensack River to the Henderson Street Substation (Preferred Alternative Project Component E) (Figures 12-3 to 12-5). Additionally, there are no wetlands identified at Preferred Alternative Project Component F for the emergency generators (nanogrid) at HBLR Headquarters.

Preferred Alternative Project Component G

A field investigation was conducted along Preferred Alternative Project Component G in 2017 by wetlands scientists, which visually confirmed the presence of wetlands adjacent to the HBLR Line at the Liberty State Park Station, located between Communipaw Avenue, the existing HBLR right-of-way, and the existing New Jersey Turnpike overpass. At this location, the HBLR is bound by a concrete retaining wall, separating the rail from the adjacent wetland and upland area. As the wetlands are under NJDEP jurisdiction, it was determined that the observed wetlands are of intermediate resource value. The wetlands meet the required criteria for an intermediate resource wetland (i.e., they do not classify for ordinary or exceptional resource values because they are not isolated wetland and not smaller than 5,000 square feet). Additionally, the wetland does not discharge into a FW1 or FW2 trout production NJDEP SWQS classified stream. (7 N.J.A.C. § 7A-2.4 [2018]).

As such, the wetlands have a 50-foot transition area, measured landwards of the perimeter of wetlands. Along Preferred Alternative Project Component G the transition area is an altered/developed non-functional transition area.

12.3.4 Vegetation

The Hackensack River, with its freshwater headwater contributions from northern reaches of the watershed and twice daily tidal fluctuations from the south, provides hydrologic support to freshwater and tidal wetland areas. Only specific types of vegetation (hydrophytic – adapted to grow in prolonged saturated conditions) can thrive in a wetland environment, as water levels fluctuate depending on season, weather and tidal conditions. Vegetation within the tidal wetlands identified in the study area includes saltmarsh cordgrass, glasswort, and spike grass; and a dominance of non-native common reed. Freshwater wetlands in the Project area have aggressive vegetative colonizers common to industrialized altered areas such as tree of heaven (*Ailanthus altissima*), black locust (*Robinia pseudoacacia*), and eastern cottonwood (*Populus deltoides*), with dominant colonization by the non-native common reed.

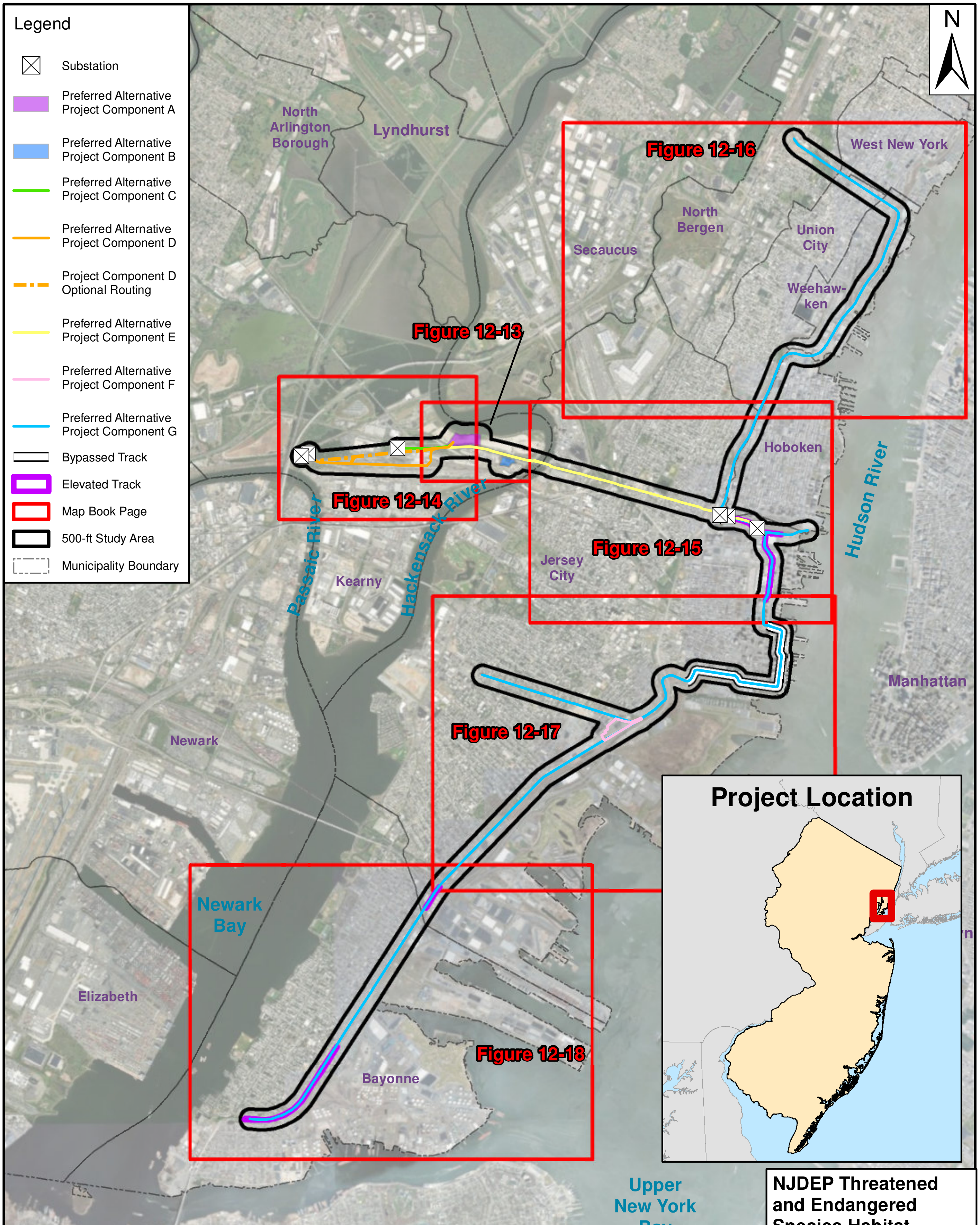
Vegetation within the upland portions of the proposed Project area include species generally found in highly disturbed and heavily urbanized areas. Tree species would likely include black locust, eastern cottonwood, mulberry trees (*Morus* spp.), Norway maple (*Acer platanoides*), princess tree (*Paulownia tomentosa*), and tree of heaven; shrubs such as Japanese barberry (*Berberis thunbergii*), multiflora rose (*Rosa multiflora*), sumacs (*Rhus* spp.); vines including English ivy (*Hedera helix*), Japanese honeysuckle (*Lonicera japonica*), Oriental bittersweet (*Celastrus orbiculatus*), and wild grape (*Vitis* spp.); and herbaceous vegetation such as chicory (*Cichorium intybus*), clovers (*Trifolium* spp.), common dandelion (*Taraxacum officinale*), common hawkweed (*Hieracium vulgatum*), Japanese knotweed (*Fallopia japonica*), mugwort (*Artemisia vulgaris*), plantains (*Plantago* spp.), pokeweed (*Phytolacca americana*), poison ivy (*Toxicodendron radicans*), and spotted knapweed (*Centaurea stoebe*).

12.3.5 Wildlife

Wildlife within Preferred Alternative Project Components A, B, C, D and portions of E west of the Hackensack River generally includes localized species tolerant of highly disturbed and heavily urbanized/fragmented areas, and transient species that migrate via larger linked corridors such as the adjoining waters or larger contiguous wetland areas to the north. Additionally, the portion of Preferred Alternative Project Component E east of the Hackensack River, and Preferred Alternative Project Components F and G are within highly developed cities and townships, and species in these areas are anticipated to be highly tolerant to an urban environment, or passerine species.

The larger populations of transient species consist of avian species that utilize the Atlantic Flyway, which stretches from the Arctic Circle down the Atlantic coast and Appalachian Mountains and into the Caribbean. This flyway includes the tidal/brackish areas north of the Project area, where more contiguous, non-fragmented habitats of the Meadowlands District provide access to food and shelter and facilitate species colonization and congregation for mating.

Bird species expected to utilize the disturbed areas of Preferred Alternative Project Components A, B, C, D and portions of E west of the Hackensack River and immediate surrounding areas include, but are not limited to: Canada goose (*Branta canadensis*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), gray catbird (*Dumetella carolinensis*), common grackle (*Quiscalus quiscula*), brown-headed cowbird (*Molothrus ater*), song sparrow (*Melospiza melodia*), cerulean warbler (*Dendroica cerulea*), wood thrush *(Hylocichla mustelina), p*urple sandpiper *(Calidris maritima),* saltmarsh sparrow *(Ammodramus caudacutus),* and fox sparrow *(Passerella iliaca)* . A bald eagle nest was documented by NJDEP, Division of Fish and Wildlife, approximately 3.5 miles southwest of the Main Facility site (Preferred Alternative Project Component A) in 2016 (NJDEP 2016). Most of these species are covered by the MBTA. Water areas within the study area are expected to provide habitat for numerous bird and wading species including gulls and terns, shorebirds, wading birds, and waterfowl, and foraging resources for raptors-birds of prey such as hawks, falcons, and eagles, as indicated on Figures 12-13 through 12-18.



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)

NJDEP Threatened and Endangered Species Habitat Key Map

NJ TRANSITGRID TRACTION POWER SYSTEM

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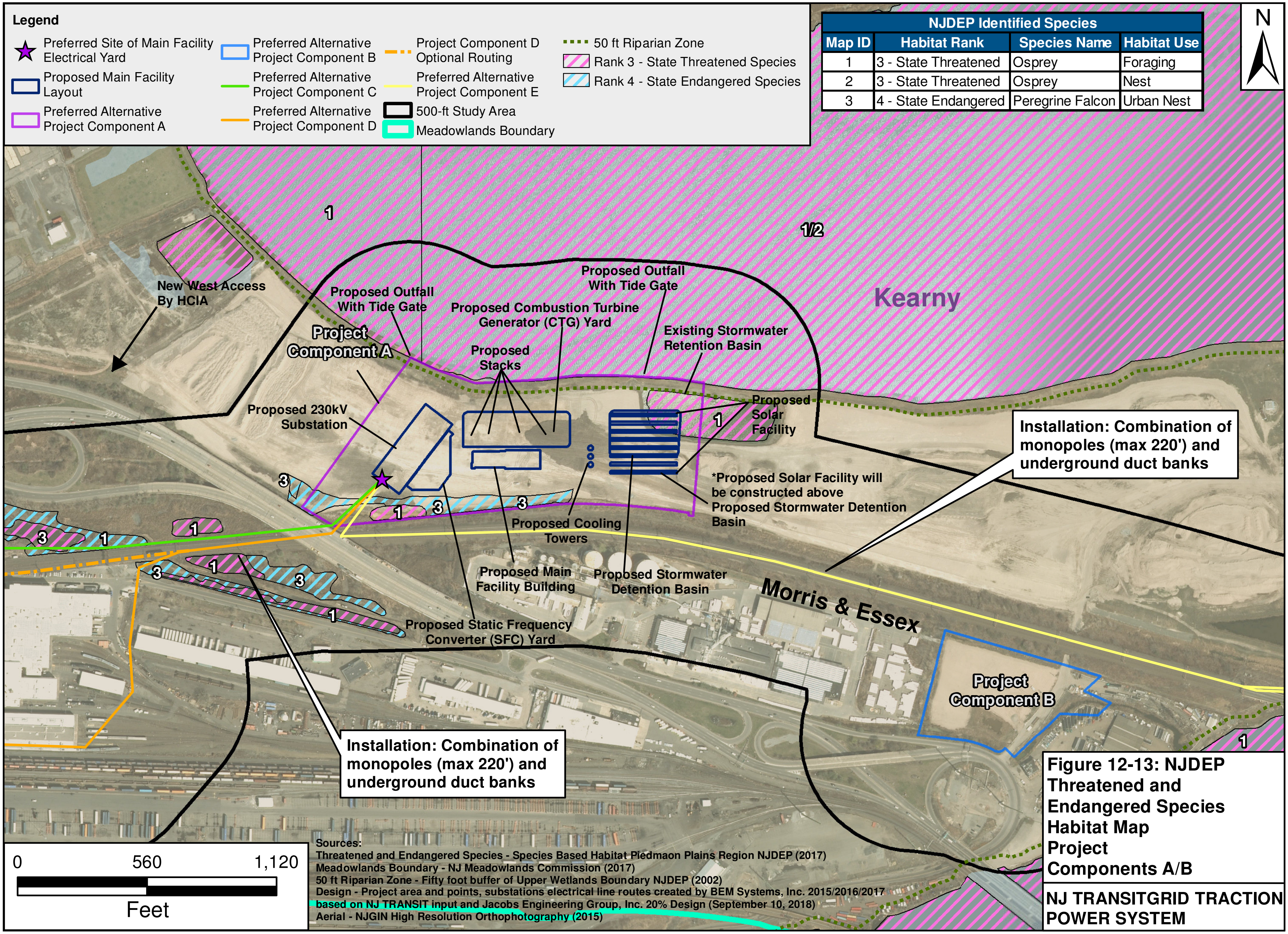

NJDEP Identified Species			
Map ID	**Habitat Rank**	**Species Name**	**Habitat Use**
1	3 - State Threatened	Osprey	Foraging
2	3 - State Threatened	Osprey	Nest
3	4 - State Endangered	Peregrine Falcon	Urban Nest

Figure 12-13: NJDEP Threatened and Endangered Species Habitat Map Project Components A/B

NJ TRANSITGRID TRACTION POWER SYSTEM

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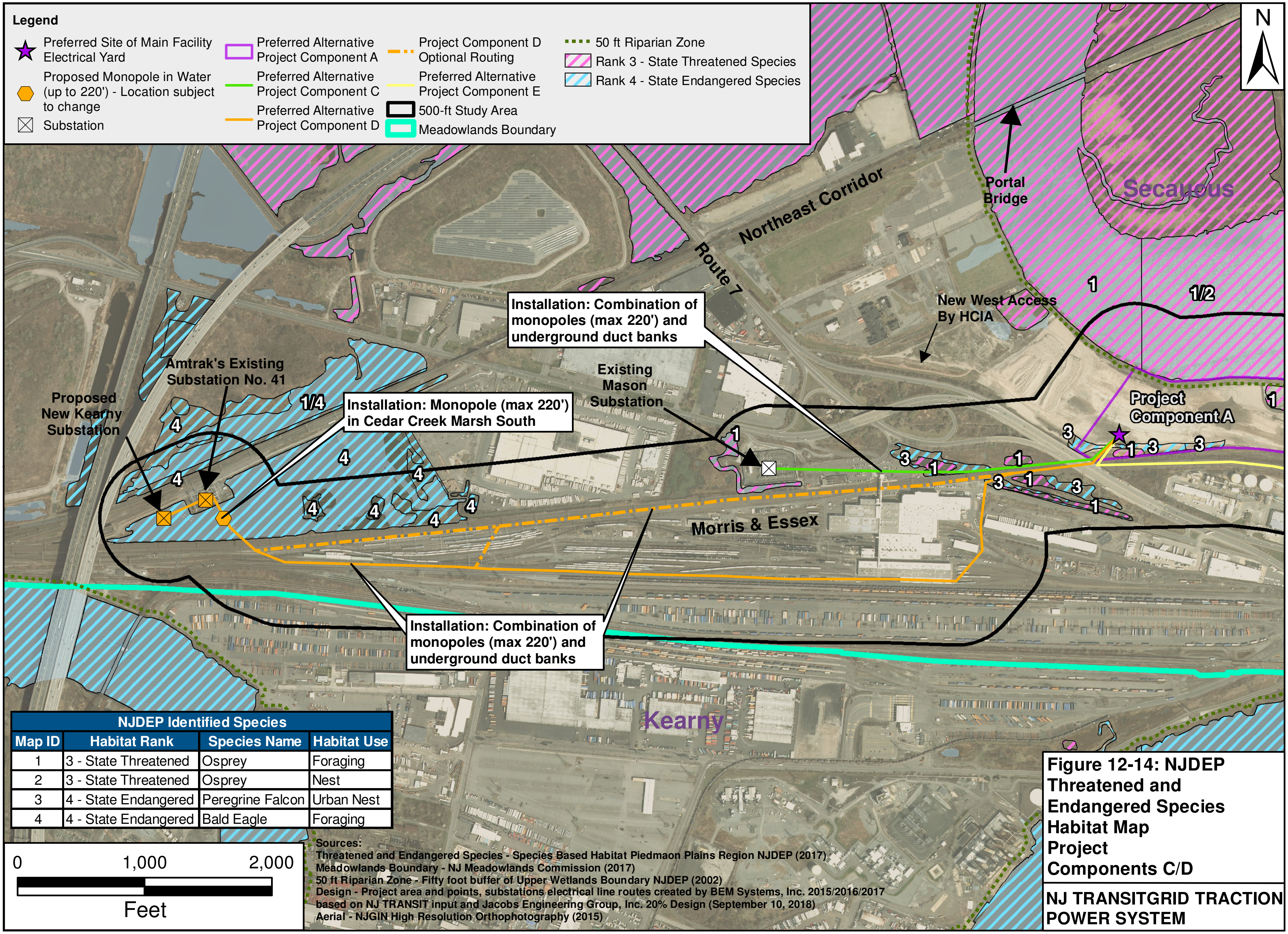

NJDEP Identified Species

Map ID	Habitat Rank	Species Name	Habitat Use
1	3 - State Threatened	Osprey	Foraging
2	3 - State Threatened	Osprey	Nest
3	4 - State Endangered	Peregrine Falcon	Urban Nest
4	4 - State Endangered	Bald Eagle	Foraging

Figure 12-14: NJDEP Threatened and Endangered Species Habitat Map Project Components C/D

NJ TRANSITGRID TRACTION POWER SYSTEM

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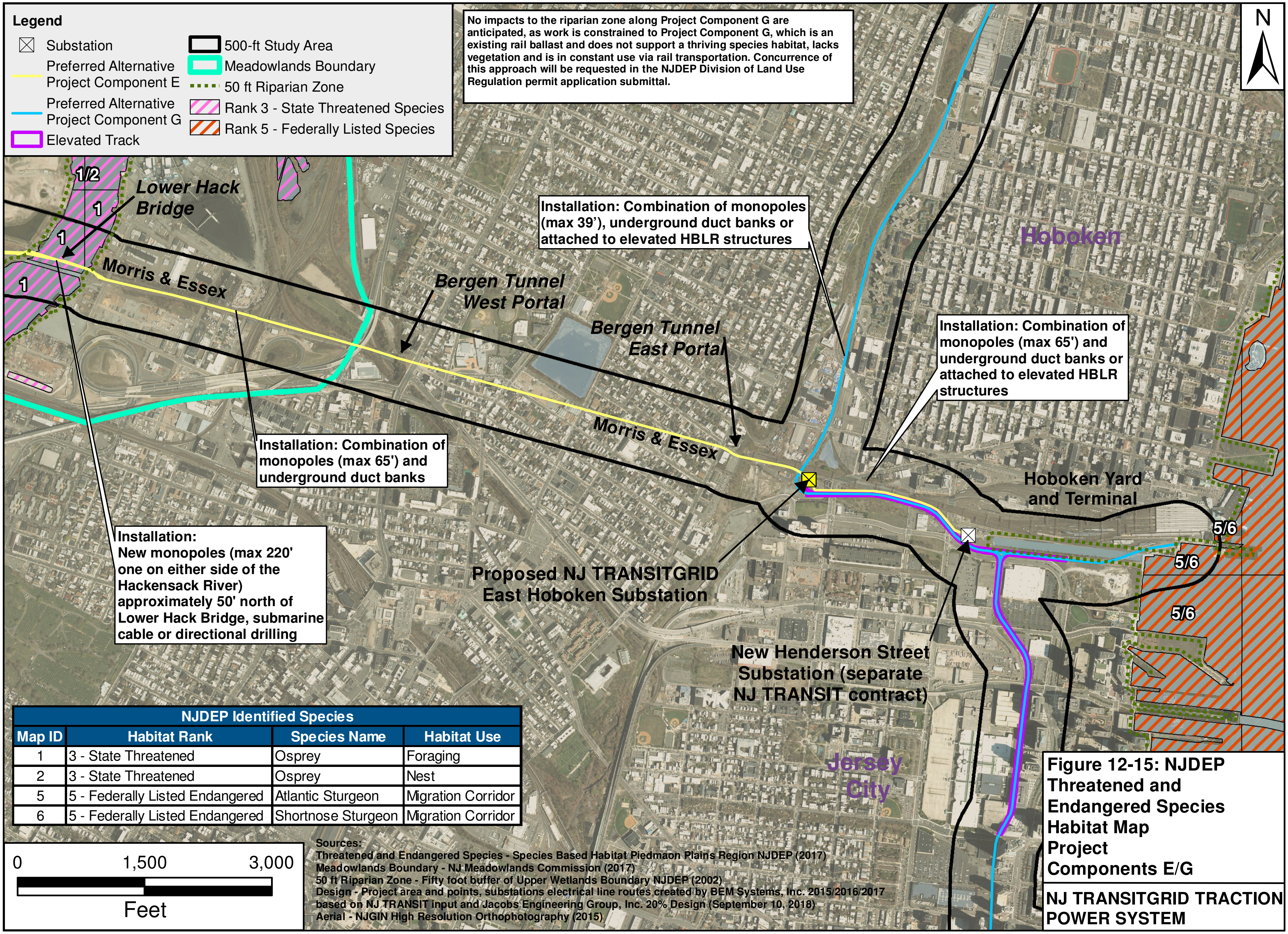

NJDEP Identified Species

Map ID	Habitat Rank	Species Name	Habitat Use
1	3 - State Threatened	Osprey	Foraging
2	3 - State Threatened	Osprey	Nest
5	5 - Federally Listed Endangered	Atlantic Sturgeon	Migration Corridor
6	5 - Federally Listed Endangered	Shortnose Sturgeon	Migration Corridor

Sources:
Threatened and Endangered Species - Species Based Habitat Piedmaon Plains Region NJDEP (2017)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
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)

Figure 12-15: NJDEP Threatened and Endangered Species Habitat Map Project Components E/G

NJ TRANSITGRID TRACTION POWER SYSTEM

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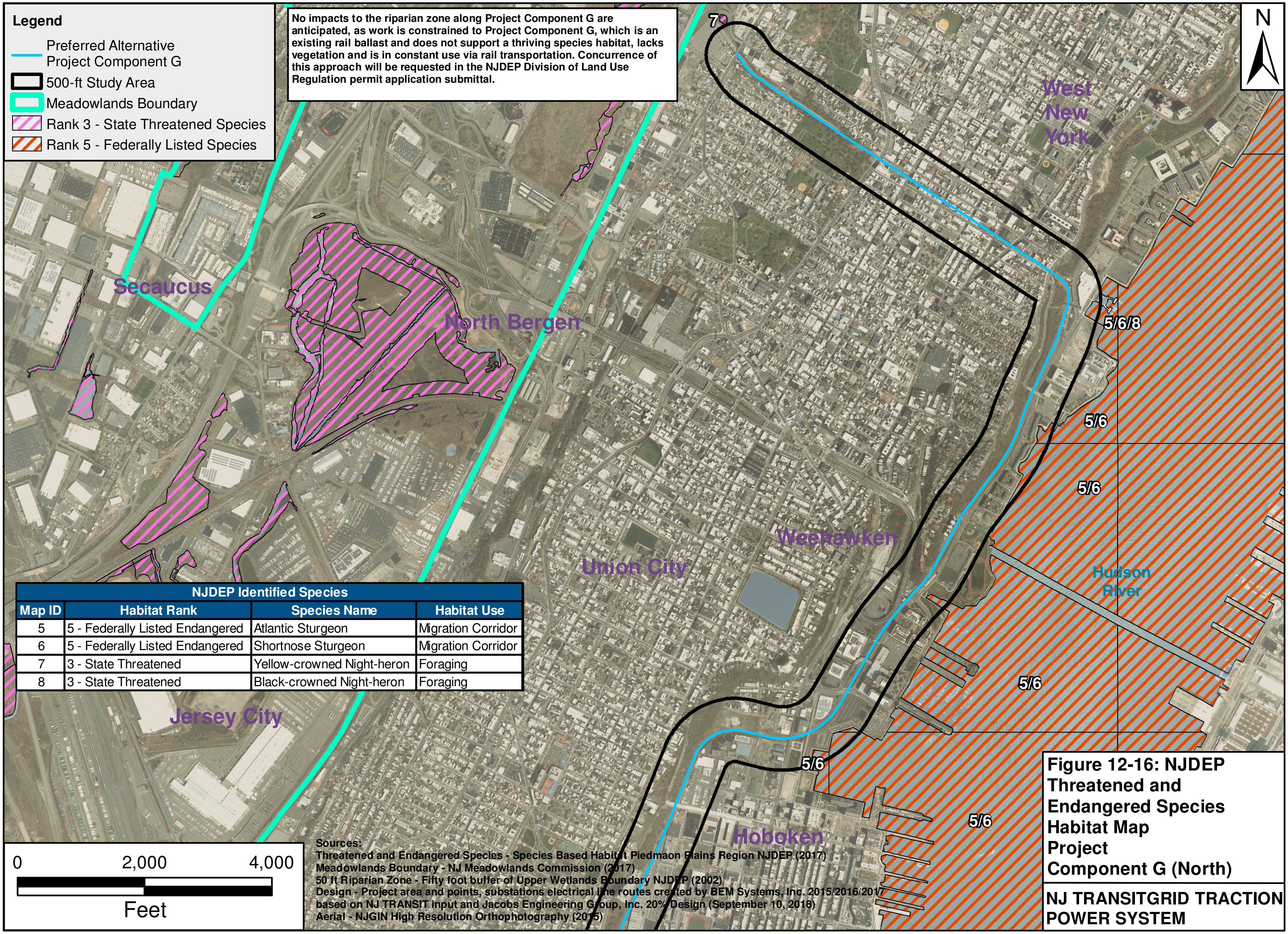

NJDEP Identified Species

Map ID	Habitat Rank	Species Name	Habitat Use
5	5 - Federally Listed Endangered	Atlantic Sturgeon	Migration Corridor
6	5 - Federally Listed Endangered	Shortnose Sturgeon	Migration Corridor
7	3 - State Threatened	Yellow-crowned Night-heron	Foraging
8	3 - State Threatened	Black-crowned Night-heron	Foraging

Figure 12-16: NJDEP Threatened and Endangered Species Habitat Map Project Component G (North)

NJ TRANSITGRID TRACTION POWER SYSTEM

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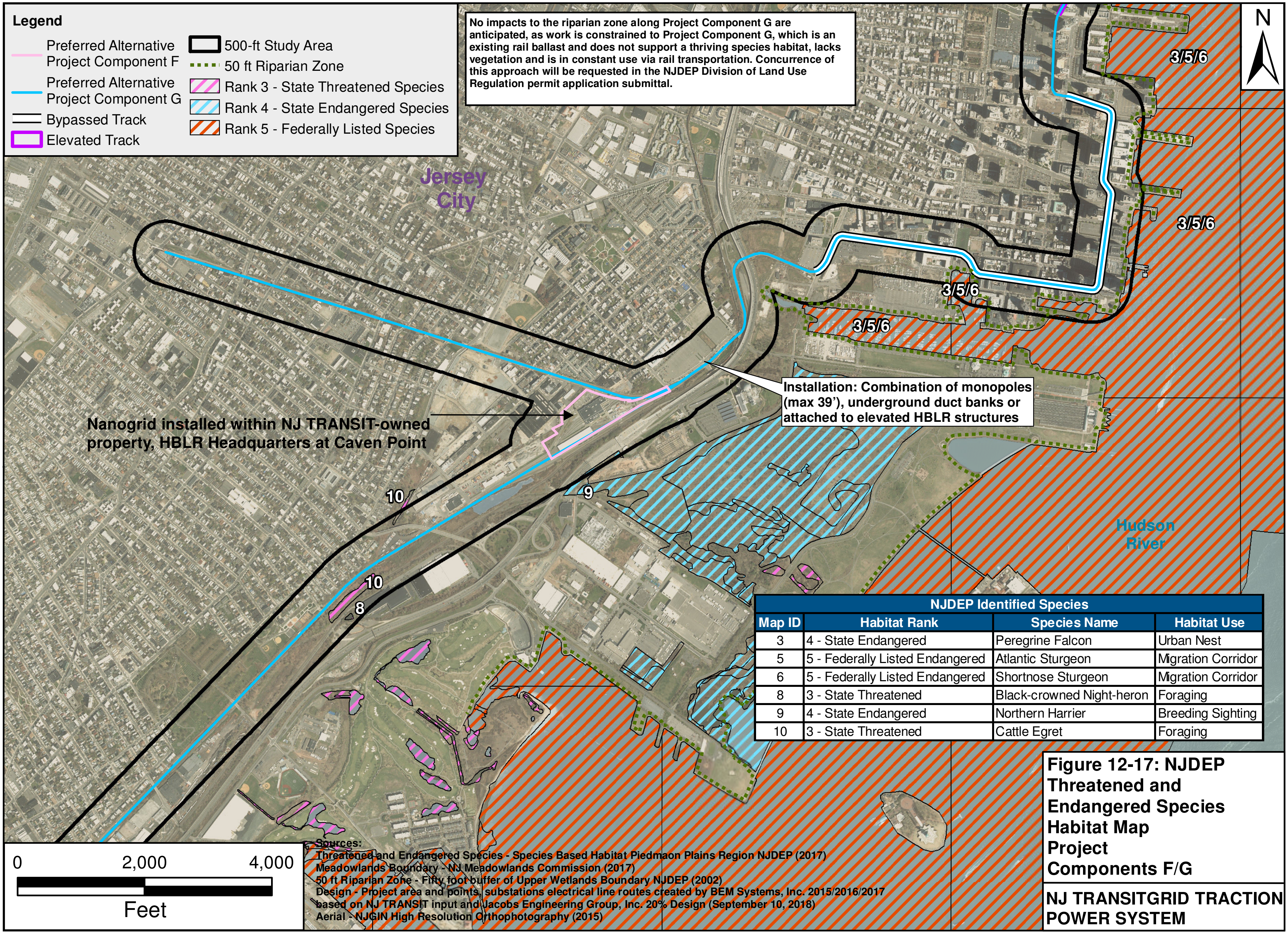

NJDEP Identified Species

Map ID	Habitat Rank	Species Name	Habitat Use
3	4 - State Endangered	Peregrine Falcon	Urban Nest
5	5 - Federally Listed Endangered	Atlantic Sturgeon	Migration Corridor
6	5 - Federally Listed Endangered	Shortnose Sturgeon	Migration Corridor
8	3 - State Threatened	Black-crowned Night-heron	Foraging
9	4 - State Endangered	Northern Harrier	Breeding Sighting
10	3 - State Threatened	Cattle Egret	Foraging

Figure 12-17: NJDEP Threatened and Endangered Species Habitat Map Project Components F/G

NJ TRANSITGRID TRACTION POWER SYSTEM

Sources:
Threatened and Endangered Species - Species Based Habitat Piedmaon Plains Region NJDEP (2017)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
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)

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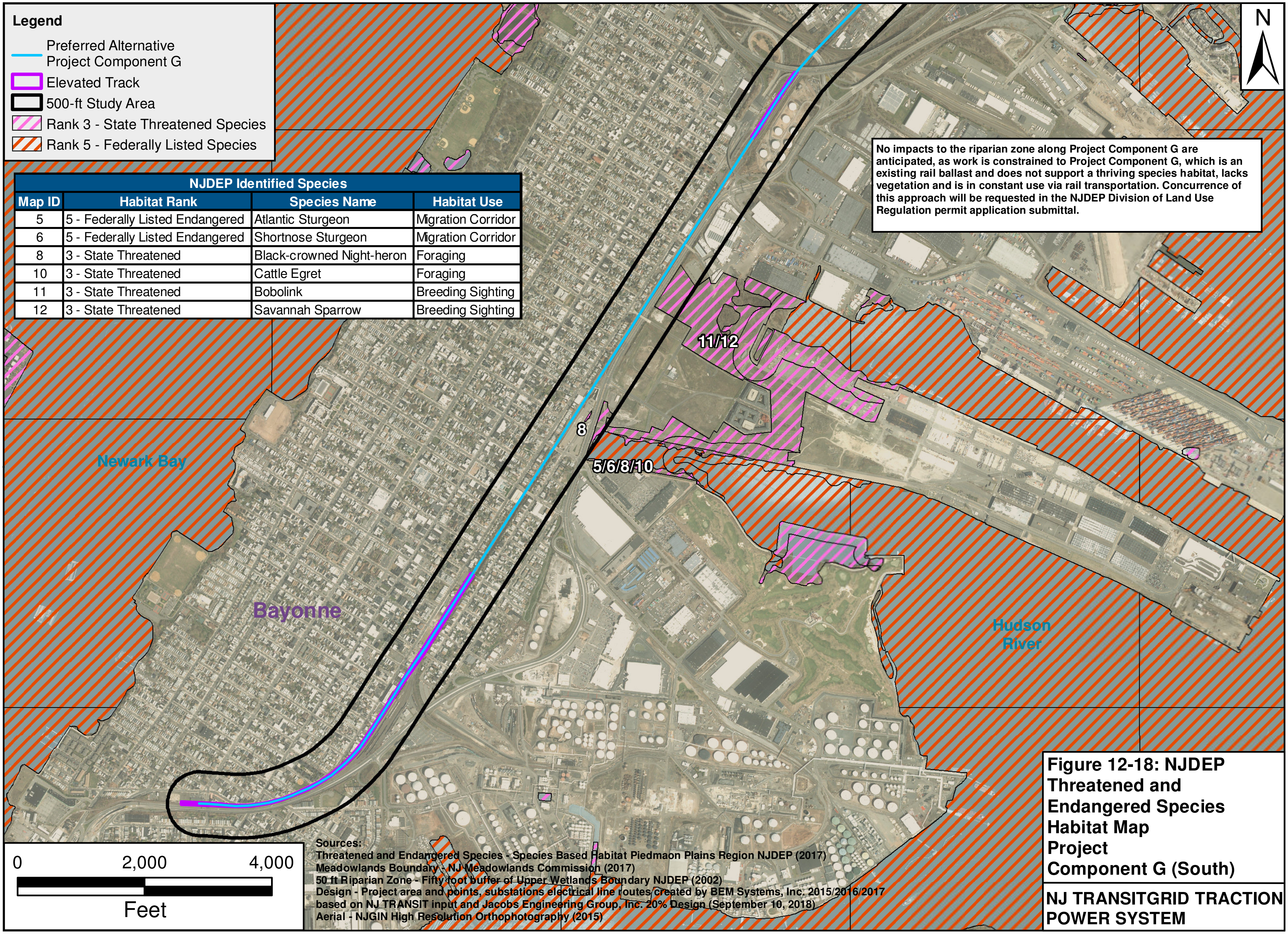


NJDEP Identified Species

Map ID	Habitat Rank	Species Name	Habitat Use
5	5 - Federally Listed Endangered	Atlantic Sturgeon	Migration Corridor
6	5 - Federally Listed Endangered	Shortnose Sturgeon	Migration Corridor
8	3 - State Threatened	Black-crowned Night-heron	Foraging
10	3 - State Threatened	Cattle Egret	Foraging
11	3 - State Threatened	Bobolink	Breeding Sighting
12	3 - State Threatened	Savannah Sparrow	Breeding Sighting

No impacts to the riparian zone along Project Component G are anticipated, as work is constrained to Project Component G, which is an existing rail ballast and does not support a thriving species habitat, lacks vegetation and is in constant use via rail transportation. Concurrence of this approach will be requested in the NJDEP Division of Land Use Regulation permit application submittal.

Sources:
Threatened and Endangered Species - Species Based Habitat Piedmaon Plains Region NJDEP (2017)
Meadowlands Boundary - NJ Meadowlands Commission (2017)
50 ft Riparian Zone - Fifty foot buffer of Upper Wetlands Boundary NJDEP (2002)
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)

Figure 12-18: NJDEP Threatened and Endangered Species Habitat Map Project Component G (South)

NJ TRANSITGRID TRACTION POWER SYSTEM

Path: \\atlas\GISDATA\Projects\NJ_Transit\Tier3\TransitGrid\2019_DraftEIS\Rev0\Figure12_TandESpecies.mxd

The following mammal species could be expected to utilize Preferred Alternative Project Components A, B, C, D and portions of E west of the Hackensack River and immediate surrounding area: eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), groundhog (*Marmota monax*), Norway rat (*Rattus norvegicus*), muskrat (*Ondatra zibethicus*), white-tailed deer (*Odocoileus virginianus)*, and white-footed mouse (*Peromyscus leucopus*).

The Hackensack River and its associated tributaries, wetlands and transitional edges form an estuarine system that supports a diverse biota including crustaceans, mollusks, oligochaetes, planktons, polychaetes, protozoa, reptiles such as turtles, and mammals. In addition, the estuary is expected to support numerous species of finfish, ranging from diadromous spawners and marine migrants to juveniles, which depend upon the protected habitats within the estuary during critical life stages. Additionally, according to the NMFS EFH Mapper, the portions of the Hackensack and Hudson Rivers located within the Project area are mapped as EFH for all life stages (adult, juvenile and larvae) of summer flounder (*Paralichthys dentatus*) and Atlantic herring (*Clupea harengus*) (NOAA 2018). Various avian tropical migratory and raptor species utilize this area as part of a larger bird migration corridor, better known as the Atlantic Flywaybird migration route, it is used for foraging, mating and nesting habitat. The Atlantic Flyway encompasses some of the hemisphere’s most productive ecosystems, including forests, beaches, and coastal wetland and provides a route for birds from South America, Caribbean up to the eastern Arctic islands and the coast of Greenland.

12.3.6 Threatened and Endangered Species Habitat

Threatened and endangered species rely on their respective environments to survive. Upon review of the NJDEP Landscape Habitat digital data, which was further confirmed through a NJDEP NHP review letter dated January 10, 2018 (see Appendix D), eight state-listed threatened or endangered species are located within one mile of the proposed Project area, and two state-listed threatened or endangered species are located onsite (see Figures 12-13 through 12-18 and Table 12-2). The NHP does not specify where the species are exactly located and identified no terrestrial or marine species in their review.

As the Hackensack and Hudson Rivers are a primary migratory pathway and provides abundant resting, foraging and breeding habitat for aquatic species, the river is also a viable resting, nesting and foraging resource for terrestrial and avian species in the area. However, these listed avian species also require canopy trees and vegetative cover for nesting locations. The only exception is the Northern Harrier which nest in the drier areas of high marsh that are dominated by salt hay (*Spartina patens*), marsh elder (*Iva frutescens*), or reed grass (*Phragmites communis*). Preferred Alternative Project Components A, B, E, F, and G all lack substantial functional canopy tree cover, established vegetated, or wildlife corridor habitat. Areas that have marsh elder (*Iva frutescens*), or common reed grass (*Phragmites australis*) are primarily located within highly developed urban areas or abut the rail transportation corridor. Vegetation, as discussed, is limited to fragmented landscaped areas dominated by understory vegetation common to developed/altered areas. Preferred Alternative Project Components C and D have interspersed established canopy tree and understory vegetation. This vegetation, however, is comprised of non-native vegetation that provides limited food resources or supporting benefits for wildlife.

Table 12-2 Threatened and Endangered Species On-Site or within One Mile of the Project Area

Within One Mile of the Project Area		
Species	**Federal/ State Designation**	**Habitat**
Atlantic Sturgeon	Federal and State Endangered	Migration Corridor/Adult Sighting/Juvenile Sighting
Bald Eagle	Federal and State Endangered	Foraging
Bobolink	Federal Not Listed State Endangered	Breeding Sighting
Black-crowned Night-heron	Federal Not Listed State Threatened	Foraging
Cattle Egret	Federal Not Listed State Threatened	Foraging
Northern Harrier	Federal: Migratory Nongame Bird of Management Concern, State Endangered	Breeding Sighting
Sedge Wren	Federal: Migratory Nongame Bird of Management Concern, State Endangered	Foraging
Yellow-crowned Night-heron	Federal Not Listed State Threatened	Foraging
Pied-billed Grebe	Federal Not Listed State Endangered	Breeding Sighting Confirmed
Savannah Sparrow	Federal Not Listed State Threatened	Breeding Sighting
Shortnose Sturgeon	Federal and State Endangered	Migration Corridor/Adult Sighting
Within the Project Area		
Species	**State Designation**	**Habitat**
Osprey	Federal Not Listed State Threatened	Foraging / Nest
Peregrine Falcon	Federal Not Listed State Endangered	Urban Nest
Bald Eagle	Federal and State Endangered	Foraging

The ESA directs all federal agencies to work to conserve endangered and threatened species and to use their authorities to further the purposes of Section 7 of the ESA, called "Interagency Cooperation," which is the mechanism by which federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. The USFWS Information for Planning and Conservation (IPaC) system was consulted for the presence of federally-listed species (i.e., threatened or endangered) and critical habitat within the study area. The formal IPaC report, dated December 19, 2017 and March 29, 2017 (see Appendix D), does not identify the presence of habitat for any terrestrial or marine federally-listed threatened, endangered, proposed, or candidate species, or identify any critical habitat within the study area. The report identified 38 bird species protected by the MBTA and the BGEPA within the study area. These species can potentially utilize the proposed Project area as habitat during their migration periods but are not anticipated to be negatively impacted by the Project's proposed activities.

Marine threatened or endangered species of significance include Atlantic sturgeon (*Acipenser oxyrhynchus oxyrhynchus*), shortnose sturgeon (*Acipenser brevirostrum*), summer founder, winter flounder (*Pleuronectes americanus*), and Atlantic herring. These species rely upon the Passaic, Hackensack and Hudson River corridors primarily for migratory passage. As their access up and downstream are vital to the life cycles of each of the aquatic species, any disturbances to the waters of these waterbodies could pose detrimental to the species if not properly considered or mitigated for with use of best management practices (BMP's). Common mitigation actions include the use of floating turbidity booms, silt curtains, haybales, and silt fence and construction timing restrictions relative to the species' migratory and breeding seasons.

Avian threatened or endangered species of significance include the Bobolink, Osprey, Peregrine falcon and Bald eagle. With exception to the Bobolink, each of these avian species are fish-eating raptors that nest and forage along major river systems and coastal areas. Three of the four species prefer to nest in large, mature canopy trees, although Ospreys and Peregrine falcons have both adapted to changing landscapes due to urban development. The Bobolink as a grain and seed forager will congregate open meadows and marshes, but prefers low intensity agricultural fields located beyond the project area for nesting/breeding activities. In the proposed Project area, Peregrine falcons tend to nest on bridge structures and tall buildings. Currently, no nest is present on the Lower Hack Bridge, and the remaining proposed Project area is devoid of any tall, mature canopy trees commonly preferred for nesting activities. To date field observations and NJDEP information has not identified records of nesting sites for these species within the project area. Being proximal to aquatic areas, however, it is expected that these species could occasionally forage in the project area.

12.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

12.4.1 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 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. Two existing lattice towers in Cedar Creek Marsh South will be replaced with a monopole. Therefore, up to 1.7 acres of Cedar Creek Marsh South will be impacted with or without the proposed Project. 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. With or without the proposed Project, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the adjacent six-acre parcel (Preferred Alternative Project Component B). As explained in Chapter 2, this acquisition is moving forward as part of a property settlement agreement between NJ TRANSIT and HCIA. Therefore, in the absence of the proposed Project, it is likely these portions of the Koppers Koke Site would be used for ancillary railroad purposes (storage, parking, etc.).

The No Action Alternative would not result in any direct or indirect impacts to natural resources within the proposed Project area except for impacts to wetlands/waters for the installation of the new Kearny Substation to replace Amtrak's exiting Substation No. 41 in Cedar Creek Marsh South. The benefits of wetland restoration (through compensatory mitigation) as discussed in Section 12.4.2 that results in purchase of wetland credits to support the ecological restoration of up to five acres of high value functional wetlands would not be realized under the No Action Alternative.

12.4.2 Build Alternative

Potential impacts to natural resources under the Build Alternative for the proposed Project are discussed below. As described in Chapter 2, "Project Alternatives," three design options were evaluated for the electrical lines, as follows: 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 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 impacts are described in Chapter 17, "Construction Effects."

Watercourses / Water Quality / Sole Source Aquifer

Since the Hackensack River is not a reservoir and all reservoirs within the Hackensack River Basin are located upstream of the Project area, and there are no USEPA sole source aquifers within the Project area, no significant adverse impacts would result to the public's potable water supply under this option. Additionally, although the proposed monopoles require foundations to be drilled at most 95 feet in depth to bedrock, double/multi-cased piles will be used to ensure groundwater contamination migration does not occur. Please refer to Chapter 17, "Construction Methods and Effect," for detail on methods to be utilized for foundation pile driving and installation.

An environmental sampling program may include investigation to identify and properly manage potentially contaminated/hazardous materials along the electrical lines (Preferred Alternative Project Components C, D, E, G, and the electrical lines for Preferred Alternative 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, 58 N.J.S.A. § 10C-1 et seq. [2013]), the Administrative Requirements for the Remediation of Contaminated Sites (ARRCS, 7 N.J.A.C. § 26C [2009]), the NJDEP Technical Requirements for Site Remediation (TRSR, 7 N.J.A.C. § 26E [2012]), May 2012, and other applicable NJDEP technical guidance documents.

Additionally, sanitary wastewater generated by the Main Facility will be discharged directly into the local sewer system and stormwater will be discharged into the Hackensack River, following pretreatment for suspended solids and settlement in the detention basin, as discussed in Chapter 15, "Utilities."

Preferred Alternative Project Component A includes the installation of an extensive NJDEP Stormwater Management Rules (7 N.J.A.C. § 8) compliant detention and drainage system throughout the Main Facility. Although approximately half of the existing retention basin would be filled, the new stormwater management system would include a new detention basin, and the construction of two new stormwater outfalls. One will be installed along the western boundary of the Main Facility, discharging into the Hackensack River, to the northwest of the Main Facility. It will drain the roadway west of the electrical yard. The other will be installed near the eastern end of the Main Facility and will drain the detention basin under the solar panel facility when the rainfall amount exceeds the capacity of the basin via the overflow weir.

The drainage system for the majority of the Main Facility would lead to a dual stormwater pre-treatment structure that would process surface runoff and precipitation particulates to remove 80% TSS prior to discharge into the detention basin. These outfalls will require excavation of contaminated materials, which had since been capped with the PDM fill currently onsite. Additionally, the outfall discharge points will require the existing bulkhead to be punctured, with discharges directly into the Hackensack River, which is designated as EFH for the summer flounder and Atlantic herring. As such, the outfall will require a USACE Section 10/404 permit and NJDEP Stormwater review. An NJDEP Division of Water Quality Pollution and Discharge Elimination Systems (NJPDES) permit will be required for the discharge of water directly into the Hackensack River channel.

The Project would not discharge any coolant water into the Hackensack River at any time during operation. Additionally, no water used to for coolant purposes will be supplied by the Hackensack River. Rather, coolant water will be supplied by the municipal water supply and will be discharged back into the municipal waste water sewer system. As such, the Hackensack River would not have any thermal effects due to coolant water discharges. The only water to be discharged into the Hackensack River would be precipitation and surface water runoff collected via roof drains and the drainage system throughout the majority of the Main Facility. The NJDEP Stormwater Management compliant stormwater design for the Main Facility (quantity) and pre-treatment measures (quality) are further discussed in Chapters 2 and 15.

During construction, turbidity barriers and silt fences will be installed and maintained, preventing sediment migration downstream. The proposed stormwater design incorporates collection of roof-run off, surface runoff and directs flows to two pre-treatment devices prior to discharging to the detention basin which would allow for additional settlement of fine particulates. The detention basin is designed to accommodate a 100-year storm event and will release overflow of pre-treated waters via the proposed outfalls to the Hackensack River. The proposed tide gate at its discharge point will serve as a control device to limit any back flow from tidal waters of the Hackensack River in to the stormwater system. No adverse effects to the EFH of summer flounder or Atlantic herring or the water quality of the Hackensack River are anticipated with the installation of the proposed outfalls and stormwater collection system. The proposed stormwater plan has been designed to performance standards for stormwater management measures required by rules pursuant to the Flood Hazard Area Control Act, 58 N.J.S.A. § 16A-50 et seq.; the Coastal Area Facility Review Act, 13 N.J.S.A. § 19-1 et seq.; the Wetlands Act of 1970, 13 N.J.S.A. § 9A-1 et seq.; the Waterfront Development Law, 12 N.J.S.A. § 5-3; and the Freshwater Wetlands Protection Act, 13 N.J.S.A. § 9B-1 et seq. Additionally, the stormwater collection, detention and discharge system has been design to comply with the NJPDES and Treatment Works Approval (TWA) programs.

The preferred option for routing the electrical line for Preferred Alternative Project Component E would cross the Hackensack River via two new monopoles located on either bank of the river 50 feet north of the Lower Hack Bridge. This would have no impacts on watercourses or water quality. However, the two alternatives for Project Component E to cross the Hackensack River, include a submarine cable that would be installed either on the river bed of the Hackensack River, or directionally drilled at a depth to ensure the river bed is not altered. Directional drilling under the Hackensack River is the least intrusive of these two methods, and would be utilized for approximately 664 linear feet of submarine cable installation. This would result in no impacts to the water bottom. For the submarine cable alternative, the water bottom of the Hackensack River upon which the cable could be laid is identified as EFH for summer flounder and Atlantic herring. The cable could impact a small portion of EFH by displacing a minor amount of water bottom habitat after construction, but would not restrict passage or migratory movement for any species of marine life or significantly reduce the amount of EHF available for summer flounder or Atlantic herring. No adverse impacts to fisheries or water quality of the Hackensack River would be expected to result from implementation of any of these alternatives.

In Cedar Creek Marsh South, the installation and operation of the new Kearny Substation and new monopole would permanently impact a small area of water bottoms (up to 1.7 acres) through displacement or shading, as well as displace any fishes and aquatic organisms to other portions of the open water areas of Cedar Creek Marsh South. However, as described above, since the area of Cedar Creek Marsh South to be used for Preferred Alternative Project Component D is hydrologically restricted from the Hackensack River due to active tide gates, the habitat value is low relative to other more connected portions of Cedar Creek Marsh. According to the NOAA NMFS (correspondence received August 4, 2016, see Appendix D) and the online NOAA EFH Mapper, Cedar Creek Marsh South includes no EFH, no Habitat Areas of Particular Concern, and no EFH Areas Protected from Fishing as the area is hydrologically restricted from the Hackensack River due to existing tide gates.

The proposed Project would not be expected to significantly impact water quality or disturb fish migration, foraging, breeding or designated EFH, as it will be designed in accordance with 7 N.J.A.C. § 8 [2016] Stormwater Management and use BMPs and adhere to the applicable in-water timing restrictions common to these migratory waters. Based on a October 25, 2018 email correspondence with Karen Greene, 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. As required, 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.

Preferred Alternative Project Components A, B, C, D, F and G will not impact any stream channels or their associated water quality.

Floodplain and Coastal Zone

Structures, fill, and vegetation that are situated on land that lies below the flood plain area design flood elevation (DFE) are described as being “in” or “within” the floodplain area. There are two types of floodplain areas:

1. Tidal flood plain areas, in which the flood plain DFE is governed by tidal flooding from the Atlantic Ocean. Flooding in a tidal FHA may be contributed to or influenced by stormwater runoff from inland areas, but the depth of flooding generated by the tidal rise and fall of the Atlantic Ocean is greater than flooding from any fluvial sources (precipitation, stormwater, surface runoff); and

2. Fluvial flood plain areas, in which the flood plain DFE is governed by precipitation, stormwater, and surface runoff. Flooding in a fluvial FHA may be contributed to or influenced by elevated water levels generated by the tidal rise and fall of the Atlantic Ocean, but the depth of flooding generated by stormwater runoff is greater than flooding from the Atlantic Ocean.

All Project Components that have associated floodplains, as shown on Figures 12-7 through 12-12, are located in a tidally influenced floodplain where the floodwaters are influenced by storm events and are regulated by daily raising and lowering of the tide. The Hackensack River is connected to Newark Bay and the Atlantic Ocean, and the Hudson River is directly connected to the Atlantic Ocean, which is considered to be a receiving basin with infinite water storage capacity.

HCIA has prepared approximately 126 acres of the Koppers Koke property for development by significantly elevating the site above the DFE criteria to comply with New Jersey's Uniform Construction Code (UCC) and other relevant requirements (5 N.J.A.C. § 23 [2018]). NJ TRANSIT's DFE for the Main Facility is +12.0 feet relative to the NAVD88. This consists of using the Federal Emergency Management Agency (FEMA) BFE of +8.0 feet NAVD88 and adding 2.5 feet to adjust for relative sea level change (SLC) expected over the 50-year Project life at this preferred location. The Sea Level Rise (SLR) calculation was obtained from the NOAA online SLC calculator using the NOAA Intermediate-High scenario, which projects an increase in sea level of 2.5 feet over the next 100 years. To this value a minimum of +1.0 foot is required by the FTA for construction in the coastal zone (Emergency Relief Program, Interim Final Rule) was added, as well as an additional +0.5-foot factor of safety that acknowledges the criticality and cost of the state's railroad infrastructure, for a final DFE of +12 feet NAVD88. The current elevations of the Koppers Koke property are greater than +25 feet NAVD88, so the site complies with these design criteria

As indicated in Figure 12-6, in Preferred Alternative Project Component A only improvements of the inland wetland areas will require fill actions within a mapped floodplain. Although Preferred Alternative Project Component A is identified to be in a mapped floodplain, post 2008 remedial actions have raised the remainder of the enveloped area to elevations above the 100-year floodplain. Ultimately the Main Facility will be developed at an elevation above the 500-year floodplain in order to comply with the NJ TRANSIT DFE. As indicated in Figures 12-7 through 12-12, segments of Project Components B, C, D, E, F, and G are located within regulated floodplains with FEMA defined BFEs.

Cedar Creek Marsh South is approximately 29 acres in size and is 0.35% of the overall 8,400 acres of wetland/water found in the Meadowlands District and managed by the NJSEA. Construction of the new Kearny Substation proposed under Preferred Alternative Project Component D will impact 5.9% of the area of Cedar Creek Marsh South, and 0.02% of the area of the Meadowlands that is available for floodplain uses. Tidal floodplains are unrestricted in nature, governed by oceanic tidal ebb and flow. Displaced waters from small filled areas are absorbed by the ocean (unrestricted), in contrast to filling areas within a freshwater pond or lake that has limited storage capacity. Because the proposed work would take place in a tidally influenced floodplain, constructing the Preferred Alternative Project Component D, which would impact up to 1.7 acres for the new Kearny Substation foundation on piers and the installation of a new monopole would not cause significant floodplain impacts or loss of flood storage capacity. The new Kearny Substation will be constructed at an elevation above the 500-year floodplain. The proposed development within Cedar Creek Marsh South would require a NJDEP FHA Individual Permit and FHA Verification.

Additionally, Project Component E is not anticipated to negatively impact the floodplain or floodway of the Hackensack River. For the preferred design option, the electrical lines would be installed on new monopoles 50 feet north of the Lower Hack Bridge, which would not impact any floodplain function. If this option is not possible, it could be alternately installed across the Hackensack River as either a submarine cable or directionally drilled under the river bottom or using a combined method. No reduction in river flood storage capacity or floodplains would occur for either of these alternatives. As required project design and permit applications will be prepared to meet the performance standards for stormwater management measures required by rules pursuant to the Flood Hazard Area Control Act, 58

N.J.S.A. § 16A-50 et seq.; the Coastal Area Facility Review Act, 13 N.J.S.A. § 19-1 et seq.; the Wetlands Act of 1970, 13 N.J.S.A. § 9A-1 et seq.; the Waterfront Development Law, 12 N.J.S.A. § 5-3; and the Freshwater Wetlands Protection Act, 13 N.J.S.A. § 9B-1 et seq.

All Project Components that would require the placement of fill in the floodplain will be designed to adhere to floodplain regulations. Additionally, there would not be an increased probability for loss of human life; there would not be an increased probability for future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility; nor would there be a notable adverse impact on natural and beneficial floodplain values.

Riparian Zones

The northern boundary of Preferred Alternative Project Component A and Project Component E at the Hackensack River crossing are the only project elements that could intercept the 50-foot riparian zone associated with the Hackensack River. At Preferred Alternative Project Component A only the two stormwater outfalls will be constructed within the portions of the riparian zone; however, this portion is devoid of vegetation and consists of PDM. Therefore, no riparian mitigation for this aspect of Preferred Alternative Project Component A is required. Under Preferred Alternative Project Component E, the electrical line would be installed on new monopoles 50 feet north of the Lower Hack Bridge and would not impact the riparian zone. If this is not possible, and directional drilling or submarine cable installation is required, the entrance and end point of the directional drill for either the fully directionally drilled option or the submarine cable installation would require excavation and post-construction backfilling, temporarily impacting the already altered and developed 50-foot riparian zone and will not require mitigation since no vegetation will be cleared. Pre-construction restoration activities are anticipated to be completed in these work areas once cable installation is complete, and no permanent impacts to the riparian zone would occur as part of this Project. No elements of Preferred Alternative Project Components A, B, C, D, E, or F are expected to intercept the 50-foot riparian zones associated with the Passaic or Hudson Rivers. Preferred Alternative Project Component G would only intersect the riparian zone of the Hudson River (50-foot zone) where the HBLR line connects with Hoboken Terminal along the existing HBLR crossing bridge structure. The riparian zone in this area is highly developed by the Hoboken Terminal and Rail Yard, with no existing vegetation. While this section of the HBLR is included for analysis in this DEIS, the design of the electrical line bypasses this riparian zone. Riparian mitigation would be addressed during the permitting phase, in the unlikely event new monopoles are necessary within this riparian zone.

Coastal Zone

No impacts to the Upper WFD Zone are proposed as part of this Project, as the majority of the Project is within the Meadowlands District Boundary, and for areas outside the Meadowlands District, work is proposed over 500 feet away from the mean high tide, or within an existing rail ballast. Pursuant to the Coastal Zone Management Rules (7 N.J.A.C. § 7 [2019]), the Upper WFD Zone ceases at railroads, and as the work is proposed on an existing railroad, it is not within the Upper WFD Zone.

The proposed outfalls are the only feature of this Project that will impact the In-Water WFD Zone. However, these impacts will be temporary, as the outfall will be installed in an existing bulkhead lining the Hackensack River, and no fill in the form of riprap, or dredging will be required for installation. BMPs will be implemented throughout the outfall installation to prevent sediment migration downstream.

Tidal and Freshwater Wetlands, Vegetation and Wildlife

Project elements that will impact wetlands, vegetation or wildlife include the proposed access road to Preferred Alternative Project Component A (0.1 acres of wetlands), the natural gas pipeline extension (connecting Preferred Alternative Project Components A and B) (0.1 acres of wetlands), the installation of Preferred Alternative Project Component D in open waters of Cedar Creek Marsh South (up to 1.7 acres of open water/wetlands), and the potential need for the installation of a submarine cable along the bottom of the Hackensack River as part of Project Component E (0.1 acres of wetlands), see Figure 12-3. It should be noted that this is not the Preferred Alternative for crossing the Hackensack River (Preferred Alternative is aerial crossing) but the 0.1 acres of wetland impacts is included in this analysis. As shown on Figure 12-1, approximately 0.1 acres of field verified fragmented wetlands located along the edge of the Morris & Essex Line will be impacted where the proposed access road will be constructed and 0.1 acres of wetlands where the gas pipeline is proposed to be constructed, running directly parallel to the existing rail line.

As indicated above, for Preferred Alternative Project Component D, the new Kearny Substation would require construction of a concrete pad on piers or the placement of fill and construction of the new monopole foundation, covering an area of approximately 1.7 acres in Cedar Creek Marsh South. Cedar Creek Marsh South is vegetated with invasive species, limited to the perimeter of the water area. These invasive species are not ideal vegetation for foraging for native fauna. While the installation of the monopole will affect 0.1 acres in Cedar Creek Marsh South, existing lattice towers and foundations located in the open waters of Cedar Creek Marsh South will be removed.

As stated in Chapter 3, “Land Use, Zoning, and Public Policy,” the Project area is located within the New Jersey Meadowlands District – an area of approximately 19,730 acres (32 square miles) in Bergen and Hudson Counties, of which approximately 8,400 acres (13 square miles) are wetlands, waterways, and open space (NJMC 2007). While up to 1.7 acres of wetlands and open water in Cedar Creek Marsh South required for the new Kearny Substation and the monopole would be filled and removed from availability as habitat, it would not comprise a substantial percentage of the Meadowlands wetlands and would not adversely impact the overall habitat quality of the Meadowlands marshes. Cedar Creek Marsh South is approximately 29 acres in size and is 0.35% of the overall 8,400 acres of wetland/water acres found in the Meadowlands and managed by the NJSEA. Filling actions proposed under Preferred Alternative Project Component D will impact 5.9% of waters in Cedar Creek Marsh South.

Project Component E could potentially require disturbances to waters of the United States, as regulated by the USACE, if the aerial crossing is not possible, and the submarine cable installation method is utilized. Under this method, 0.1 acres of the Hackensack River channel bed crossing from Kearny to Jersey City would be disturbed but would be expected to rapidly return to normal sedimentation. No wetlands were identified within the boundaries of Preferred Alternative Project Components C and F. Likewise, Preferred Alternative Project Component G would not result in any adverse impacts to wetlands or wildlife in the Project area, as the Project area is heavily developed, and proposed activities will take place within the developed transportation right-of-way.

As discussed in Section 12.3.3, the wetlands onsite have limited function as a natural barrier due to their fragmented nature. Also, due to the isolated nature of the wetland areas, the capacity to hold stormwater or floodwaters and to filter debris and soils is limited. As such, the proposed activities onsite, specifically the construction and operation of Preferred Alternative Project Component A, are not anticipated to significantly adversely impact the surrounding environment. Although this small portion of the Marsh will be permanently impacted, the USFWS and NJDEP listed species can temporarily rely on the larger complex during construction. The Bald eagle is known to inhabit the shores of the Hackensack River in the Project area. However, according to the 2018 NJDEP Bald Eagle Project report, only one breeding pair was identified in Kearny, and the hatchling survival was unsuccessful. As such, the area is largely uninhabited by the Bald eagle. Furthermore, 32 Bald eagles were recovered by the NJDEP in 2018. Of the 32, 6 died due to electrocution, 2 were hit by trains and 1 impacted wires.

Once construction is completed, these species may resume normal functions on this Marsh area for foraging. No nesting habitat is anticipated recorded or observed at this location, as there are no canopy trees present. During construction it is anticipated that avian species that use existing high voltage electrical wires, monopoles and towers will vacate the area once pre-construction and construction activities begin. Upon the completion of construction, the installed high voltage wires and monopoles will remain consistent with the current conditions of the site. The FTA recognizes the possibility of insignificant and discountable take of endangered birds should they choose to rest on high voltage power lines, which could result in life threatening injuries to the individual bird.

Any negative impacts will be compensated for within the upper Meadowlands District, where functional and contiguous tidally connected wetlands/habitat are located, and the compensation contributions would have greater benefit to wildlife and people. The impacts of the activities proposed within the open waters of Cedar Creek Marsh South will be partially compensated for in-kind, through the demolition of existing lattice towers and sub-structure which is anticipated to result in a “no net loss” by restoring its function as a water resource. However, the existing Amtrak Substation No. 41 pad will not be removed. No permanent impact to the marsh’s functionality would occur upon completion of the proposed Project. As indicated in Chapter 17 “Construction Effects,” standard cut and cover installation methods would be used to install the natural gas pipeline, and the water and sewer extensions/connections in all areas where there are no wetlands present. Directional drilling would be used to install natural gas pipelines and utility extensions/ connections where wetlands have been field delineated. As a result, the field verified wetlands in the proposed Project area would not be disturbed.

Vegetation within the proposed Project area is limited to the field-verified wetlands, which would not be disturbed as a result of the proposed Project’s implementation since directional drilling would be used to install the natural gas pipeline and other site utilities. As indicated above, the wetlands in the proposed Project area are not conducive to supporting wildlife, including threatened and endangered species, or their habitat, due to their low resource value and proximity to active rail lines. As a result, impacts to avian and terrestrial species, including bald eagle and other birds protected by the MBTA and BGEPA, would not be anticipated to result from the proposed Project's implementation.

Additionally, per consultation with the USFWS, NMFS, and NJDEP NHP, no marine threatened and endangered species other than shortnose sturgeon (see Table 12-2) are identified to be within the Project area, therefore, as the installation of the submarine cable will adhere to the applicable timing restrictions, no impacts to threatened or endangered marine species are anticipated. NOAA has also identified the portion of the Hackensack River where the submarine cable is potentially to be installed as an EFH for the summer flounder. Consultation with NOAA was initiated to determine if an EFH study is applicable for submarine cable placement, since it would displace a small portion of EFH (less than 2,000 square feet). However, if the aerial crossing is used, there will be no impacts to EFH. Also, if the submarine cable were to be installed using directional drilling methods and would lie underneath the bottom of the Hackensack channel, no permanent impacts to the river or the habitat would be anticipated. Furthermore, soil erosion and sediment control measures will be in place during construction to prevent sediment migration downstream, including turbidity booms and silt curtains. Consultation with NOAA on October 24, 2018, resulted in NOAA agreeing that the Project would not adversely impact EFH for summer flounder, and EFH for winter flounder and anadromous fishes would be avoided, provided the January through June EFH timing restriction is adhered to during construction, and soil migration downstream is minimized by using BMPs. NOAA also stated that their final determination on the need for an EFH assessment would occur during the agency review of the USACE's Section 10/404 Individual Permit. Please see Appendix F for a log of this consultation phone call.

12.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

Watercourses / Water Quality / Sole Source Aquifer

No significant adverse impacts to the Hackensack River are anticipated due to the Project activities. The preferred option to cross the Hackensack River is to use an aerial route via two new monopoles. If a submarine cable is used, the probable impacts are dependent on the chosen installation option (i.e., river bottom or directional drilling). However, soil erosion and sediment control measures will be in place throughout the installation phase, no matter which installation option is chosen. Additionally, EFH areas identified onsite will not be impacted, as the Project will coordinate the installation phase to be outside of the NFMS timing restriction window, which is anticipated to be between January and June. Preferred Alternative Project Components A, B, C, D, F, and G will not impact any stream channels or their associated water quality. There are also no sole source aquifers located within the Project area. Additionally, foundation piles will be driven with double/multi-casing wall for protection against sediment migration to avoid groundwater contamination migration during construction, and water pumps will be used to ensure no groundwater runoff will occur while drilling. No significant adverse impacts to groundwater are anticipated due to the Project activities.

Floodplain and Coastal Zone

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. Even still, the Project will require a NJDEP FHA Individual Permit and FHA Verification, as work is proposed within the floodplains of the Hackensack, Passaic and Hudson Rivers, all of which are tidally influenced at the Project locations.

Executive Order 11988- Floodplain Management

Executive Order 11988- Floodplain Management, 42 Fed Reg 26951 (issued May 24, 1977) was issued to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains as well as avoidance of direct or indirect support of floodplain development. The proposed Project includes work within tidally influenced floodplains and must ensure compliance with local, state and federal regulations to avoid adverse impacts. Below is a summary of how the project activities meet compliance with the applicable Sections of EO 11988.

Section 1

As stated in Chapter 1, "Purpose and Need," the proposed Project by NJ TRANSIT and FTA is in direct response to Superstorm Sandy and is a public transportation resilience project that will enhance the resiliency of the electrical supply to existing NJ TRANSIT and Amtrak infrastructure that will minimize public transportation disruptions during future severe weather events. The public transportation infrastructure that would be enhanced from the proposed Project connects Manhattan with northern New Jersey across the Hudson River. During Superstorm Sandy, power outages caused by the severe weather impacted NJ TRANSIT's light rail, bus service and commuter rail, as well as ferry services in the region. As public transportation services remained disrupted for a prolonged period after the storm, with full service not being restored until 34 days after the storm. The purpose of the proposed Project is to enhance the region's public transportation resiliency for future storm events so the public safety, health and welfare is upheld.

Section 2

Further discussed in Section 12.3.2 of this Chapter, the majority of the Project area is located within the FEMA-identified tidally-influenced floodplains of the Passaic, Hackensack and Hudson Rivers, as shown on Figures 12-7 to 12-12, which varies in flood elevations from +9.0 to+16.0 feet NAVD88. The floodplain is sourced by and recedes back into the Newark Bay and ultimately the Atlantic Ocean, and has an almost infinite floodwater storage capacity. As such, the construction activities outlined in Chapter 2, "Project Alternatives," will not impact the local or regional storage capacity.

In addition to not impacting the floodplain or the surrounding region's floodwater storage capacity, in Chapter 2, "Project Alternatives," a detailed alternatives analysis was performed for the Project. While the proposed Project's transmission lines and substations are located within existing utility rights-of-way or heavily developed areas, and therefore no feasible alternatives were possible, the Main Facility site required a detailed siting analysis. Twenty-one parcels on the Kearny Peninsula were evaluated based on siting criteria that considered the existence of current land uses on the site and how well each site would facilitate the Build Alternative, as well as proximity to existing substations and power lines, natural gas supply lines, the site's ability to reduce the need to construct electrical lines in or above open waterways or wetlands and construction, schedule and environmental review and permitting risks. The Kearny site located in the central portion of the peninsula was selected as the preferred site because it fulfilled all aspects of the siting criteria.

Section 3

The NEPA process, NJDEP and USACE regulatory permitting processes all include a public review and comment period, during which other local, state and federal agencies, as well as the general public may review the proposed Project activities and submit questions and/or comments. Additionally, the design will comply with the state of New Jersey's Uniform Construction Code (NJ UCC), the NJDEP's Stormwater Management Rule standards, and the NJDEP FHA Rules, ultimately complying with the National Flood Insurance Program standards to the maximum extent practicable. Further floodproofing measures will include elevating structures, transmission lines, substations and other utility buildings above the FEMA-identified BFE. Due to previous remedial activities conducted at the location of Preferred Alternative Project Components A and B, the site elevation has been elevated with processed dredge material (PDM) about the NJDEP FHA, FEMA and NJ UCC elevation requirements.

Section 4

Section 4 of the Floodplain Management EO 11988 is not applicable to the proposed Project as there will be no financial transactions to or with any private parties.

Section 5

FTA as agency has coordinated compliance with CEQ and the Water Resource Council regarding procedures in complying with this Order.

Section 6

Section 6 of EO 11988 provides definitions for specific terms set in the Executive Order. As such, there are no actions needed to be taken to ensure the Project complies with EO 11988.

Section 7

Section 7 of EO 11988 revokes EO 11296. As such, there are no actions needed to be taken to ensure the Project complies with EO 11988.

Section 8

The proposed Project is not being conducted as part of emergency work to save lives, protect property and provide public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974

Section 9

The proposed Project is not covered under Section 104 (h) of the Housing and Community Development Act of 1974. The proposed Project evaluated under this EIS and subject applicant assumes the responsibilities associated with the environmental review process pursuant to the National Environmental Policy Act (NEPA) of 1969.

Riparian Zones

Project Component E is the only project element expected to temporarily impact the 50-foot riparian zone adjacent to the Hackensack River if the preferred option of aerial crossing north of the Lower Hack Bridge cannot be used. As discussed, the potential directional drilling entrance and endpoints will both require excavation within the riparian zone. No other project elements are expected to impact the 50-foot riparian zones adjacent to the Passaic, Hackensack, and Hudson Rivers.

Coastal Zone

No impacts to the Upper WFD Zone are anticipated as part of the proposed Project. However, temporary impacts to the In-Water WFD Zone are anticipated as part of the stormwater outfall installation in Preferred Alternative Project Component A. BMPs will be maintained throughout construction to minimize sediment migration downstream.

Tidal and Freshwater Wetlands, Vegetation and Wildlife

As regulated by the USACE, the wetland/waters impacts, which would be up to two acres, would require compensatory mitigation (Table 12-3), and would be addressed in accordance with federal and state wetland mitigation guidelines at a replacement ratio of 1 acre impact to 1 credit (1:1). Wetland mitigation bank credit purchase is a federal and state authorized method of compensation to achieve a “no net loss” of wetland/water resources for this watershed management area and resources to be impacted under the proposed project footprint. Federal and state authorized wetland bank credit providers exist and can service the proposed Project’s watershed. If needed, riparian mitigation will also be addressed during the permitting phase and coordinated with NJDEP for the appropriate mitigation approach.

Table 12-3 Wetland and Waters of the United States Impacts Summary

Project Component	Impact Acreage
Preferred Alternative Project Component A	0.1 acres of wetlands
Preferred Alternative Project Component B	0.1 acres of wetlands
Preferred Alternative Project Component C	None
Preferred Alternative Project Component D	1.7 acres of waters of the United States
Project Component E*	0.1 acres of waters of the United States
Preferred Alternative Project Component F	None
Preferred Alternative Project Component G	None
Total	2 acres

*Note that the Preferred Alternative for Project Component E will not impact wetlands or waters of the United States

Any temporary wetland impacts due to construction staging, and any permanent wetland disturbances and loss of ecological function, would be mitigated through the purchase of wetland mitigation bank credits. Outlined at 40 C.F.R. § 230 [2008] – Compensatory Mitigation for Losses of Aquatic Resources, mitigation via credit purchase is the preferred method for completing mitigation requirements. As the proposed activities are located in the Watershed Management Area No. 5 – Hackensack, Hudson and Pascack, and the Hydraulic Unit Code (HUC) No. 30103180, the servicing state and federally approved mitigation banks are the Kane Mitigation Bank for transportation activities within the Meadowlands District, and MRI-3 for transportation activities outside the Meadowlands District. This compensatory mitigation alternative will be coordinated with the USACE and the Interagency Review Team (IRT) that oversees wetland impacts and proposed mitigation for wetland resources located in the Meadowlands District. 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. Wetland credit purchase is assumed to be estimated, equivalence of 1 credit is equal to 2.4 acres of restored high value functional wetlands. Although up to two acres of low value isolated wetlands will be eliminated by the Build Alternative, through mitigation, the project will support the restoration of up to five acres of high value, functional wetlands within a contiguous tidal marsh and aquatic nursery. Based on the current wetland Mitigation Bank Inventory (MBI) ledger the Kane Mitigation Bank has 24.55 credits available, and MRI-3 Mitigation Bank has 7.89 credits available.

In addition, NJ TRANSIT will procure the necessary permits and adhere to all relevant permit conditions that apply to the protection of natural resources to mitigate the potential for significant adverse effects. These include the:

- NJPDES Permit for the discharge of water directly into the Hackensack River channel;
- NJDEP FHA Individual Permit and FHA Verification for the proposed fill and development activities within the floodplain associated with the Hackensack River;
- NJDEP Waterfront Development In-Water Individual Permit for activities located within the In-Water WFD Zone below the MHW line of the Hackensack River;
- Water Quality Certificate for the disturbances proposed within waters of the United States and wetlands; and
- USACE Section 10/404 Individual Permit for the proposed wetland and navigable water disturbances and fill activities proposed.

Chapter 13 Soils and Geology

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): PDM[13], 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

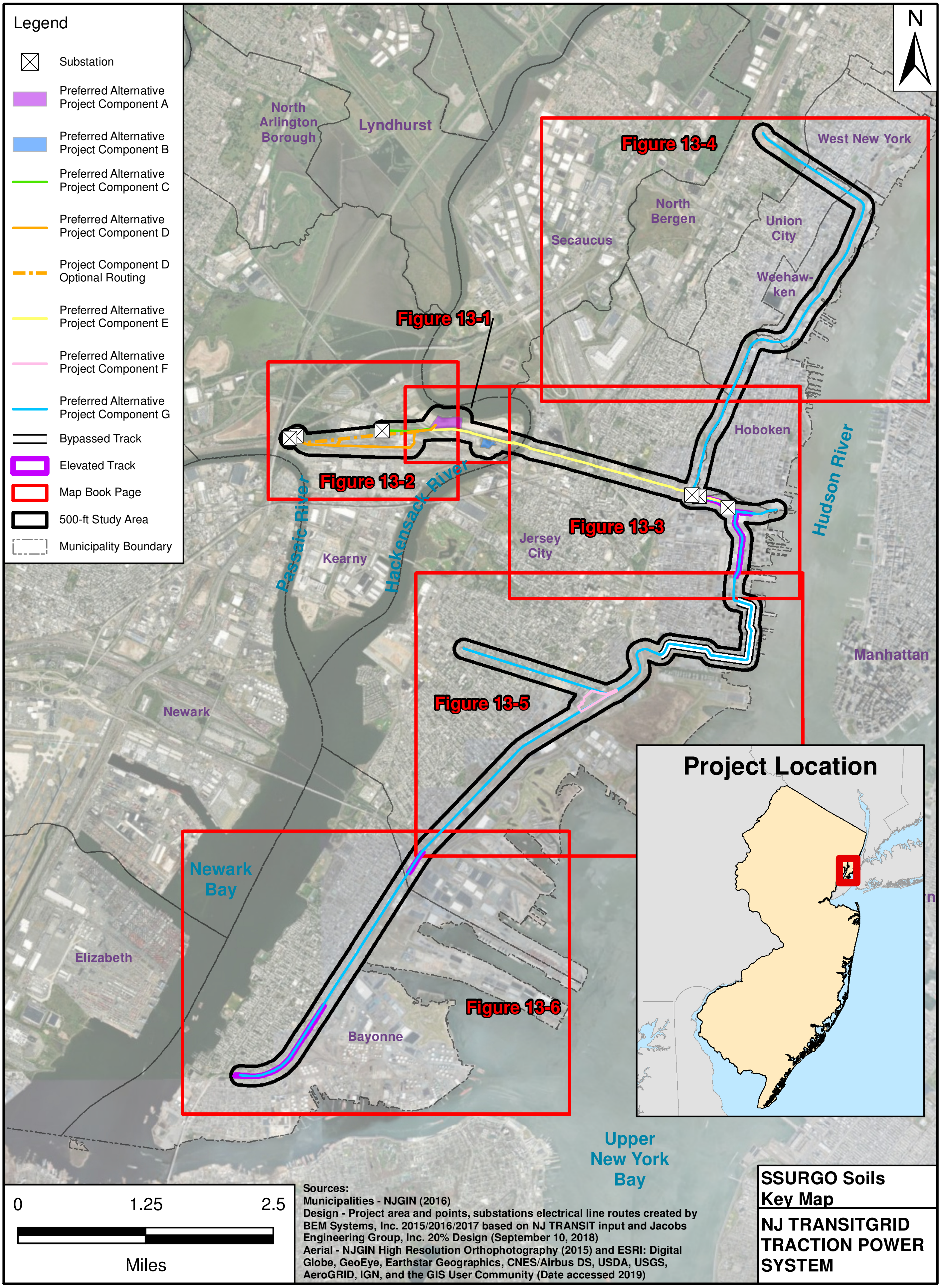
[13] Processed dredge material, or PDM, is dredge material that has been treated or otherwise processed into engineered structural fill for reuse. At Koppers Koke Site, the PDM has been placed in order to cap existing environmental contamination, preventing it from leaching offsite.

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 artifactual 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 artifactual fine sandy loam is



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 TRANSITGRID TRACTION POWER SYSTEM

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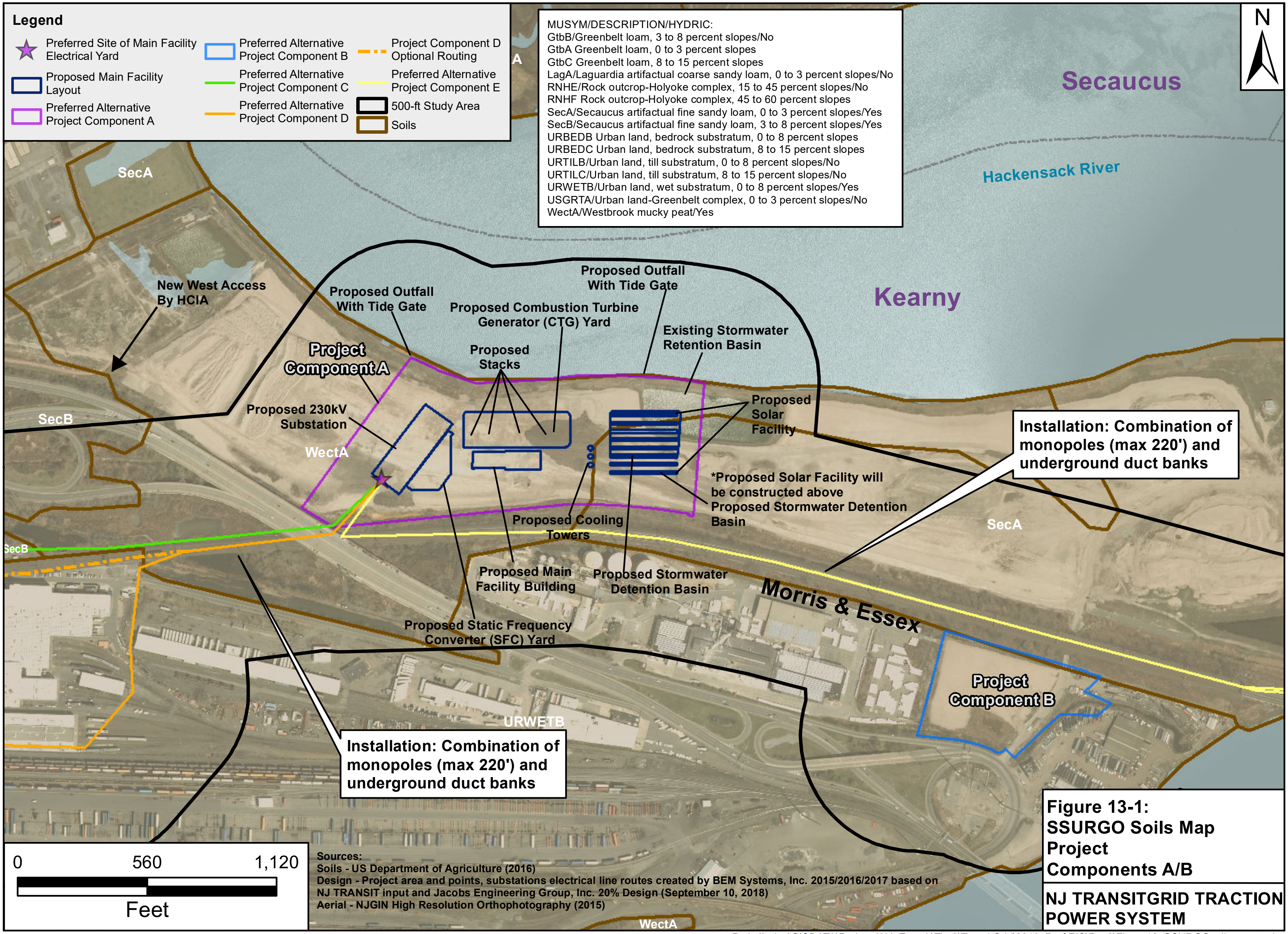

Figure 13-1: SSURGO Soils Map Project Components A/B

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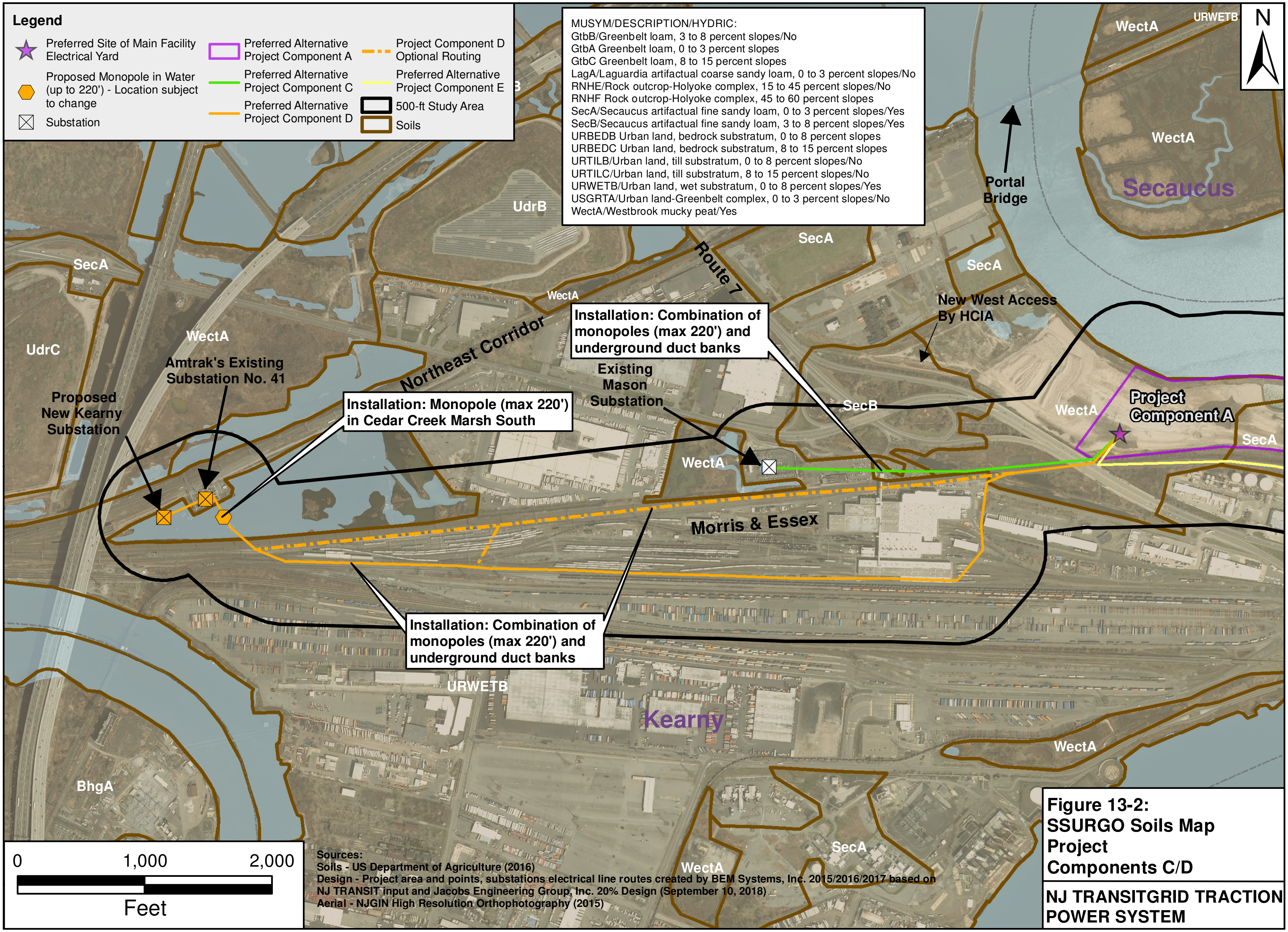

Figure 13-2: SSURGO Soils Map Project Components C/D

NJ TRANSITGRID TRACTION POWER SYSTEM

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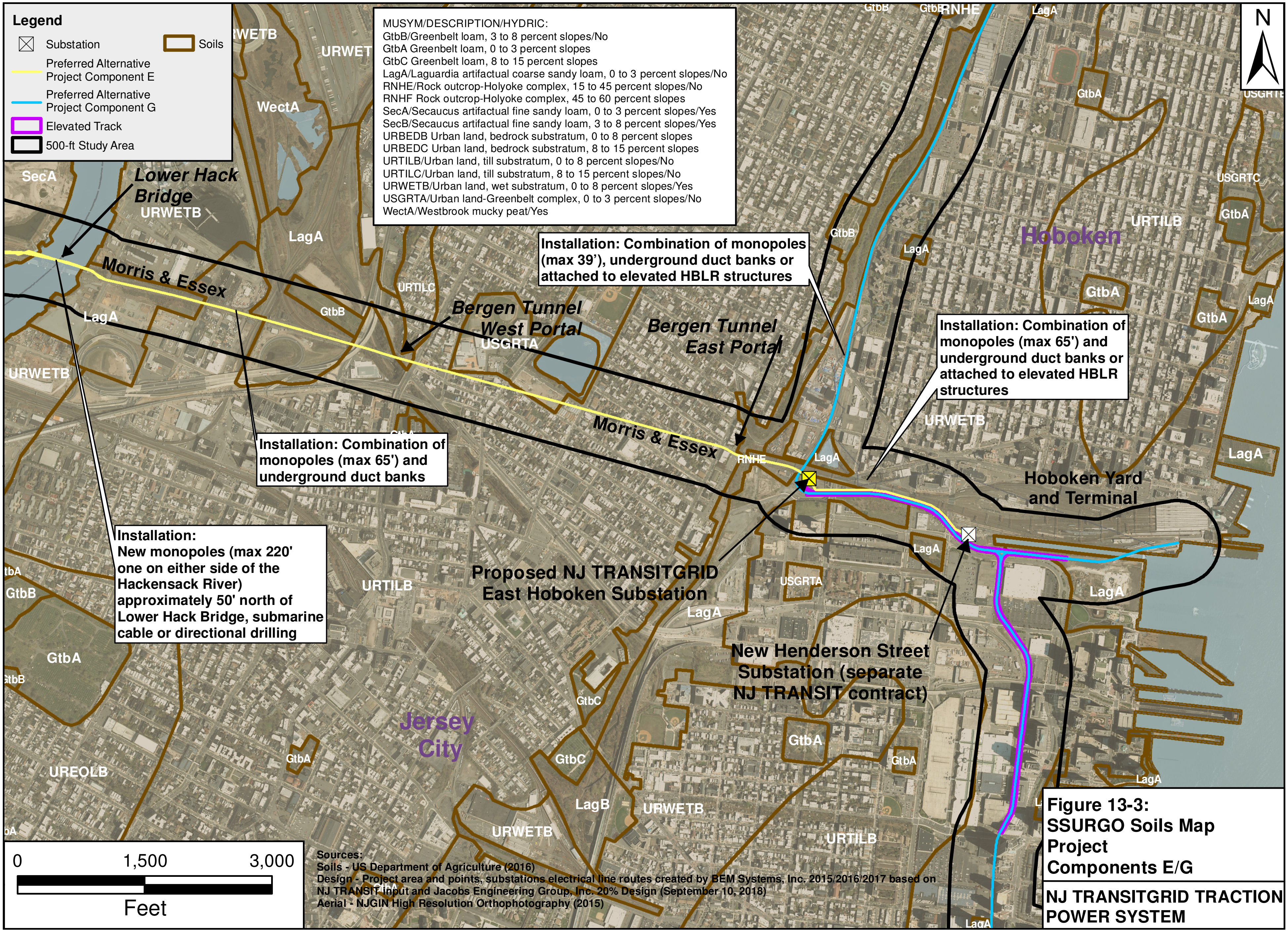

Figure 13-3: SSURGO Soils Map Project Components E/G

NJ TRANSITGRID TRACTION POWER SYSTEM

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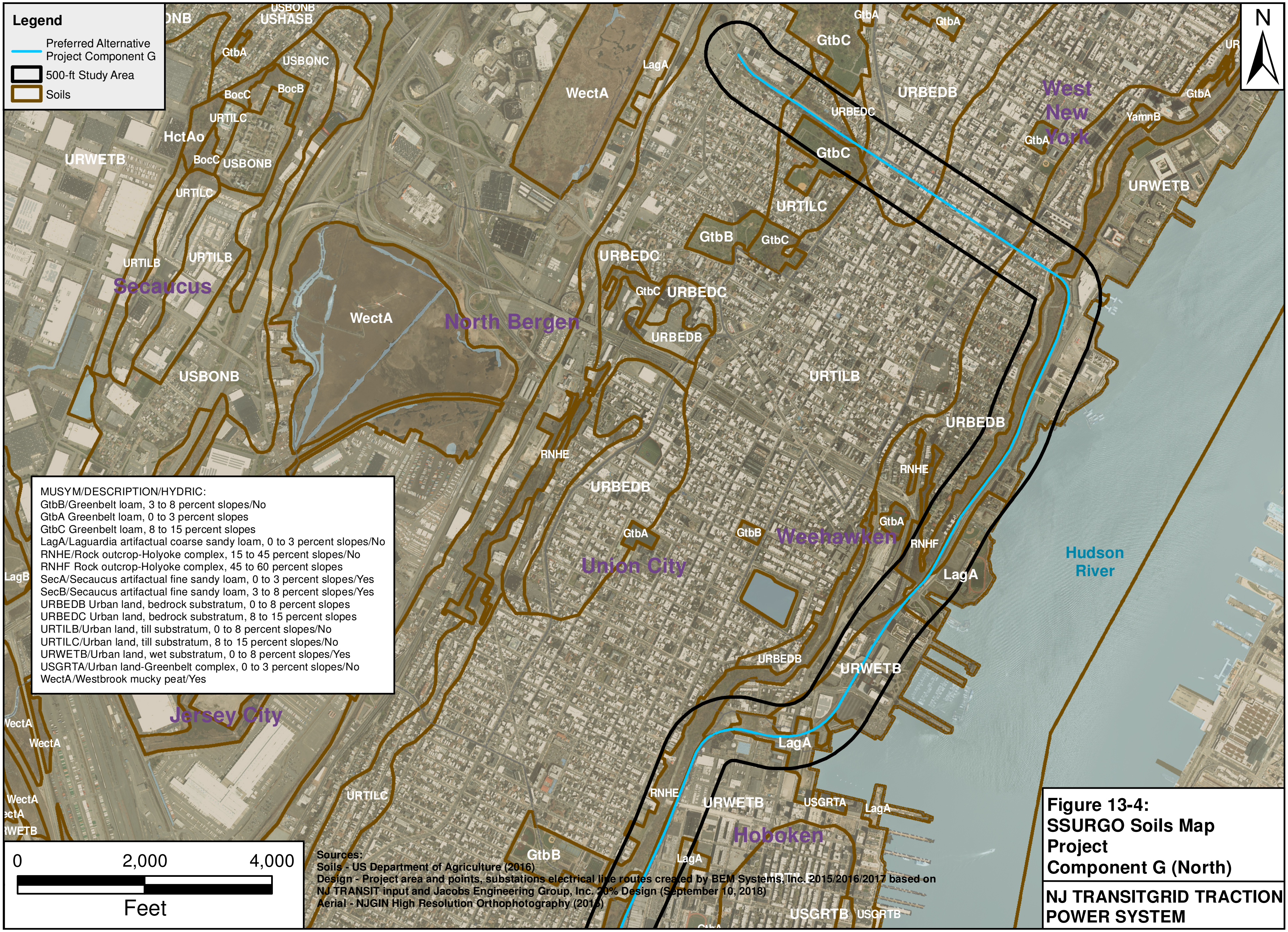

Figure 13-4:
SSURGO Soils Map
Project
Component G (North)

NJ TRANSITGRID 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. 30% Design (September 10, 2018)
Aerial - NJGIN High Resolution Orthophotography (2015)

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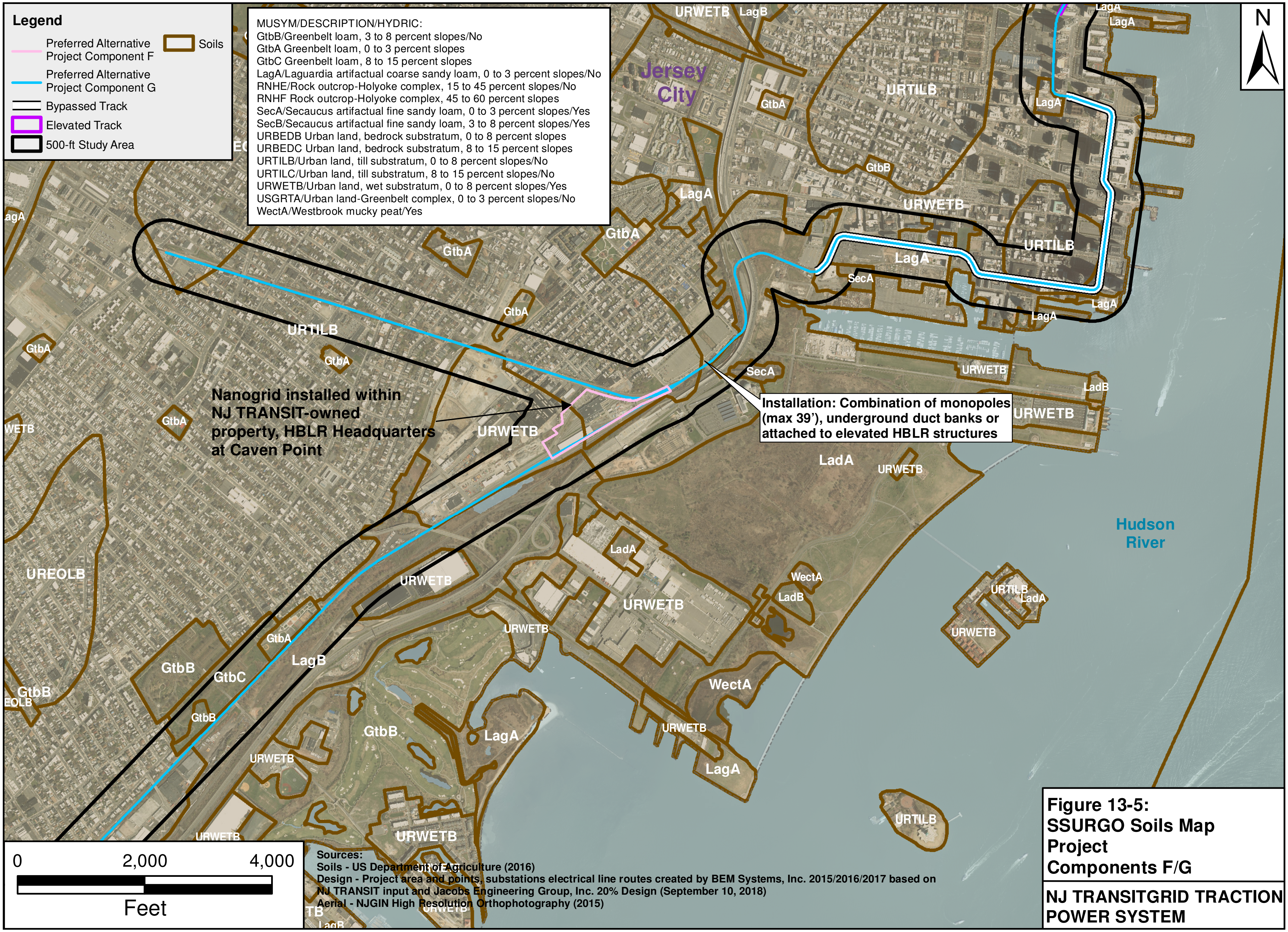

Figure 13-5: SSURGO Soils Map Project Components F/G

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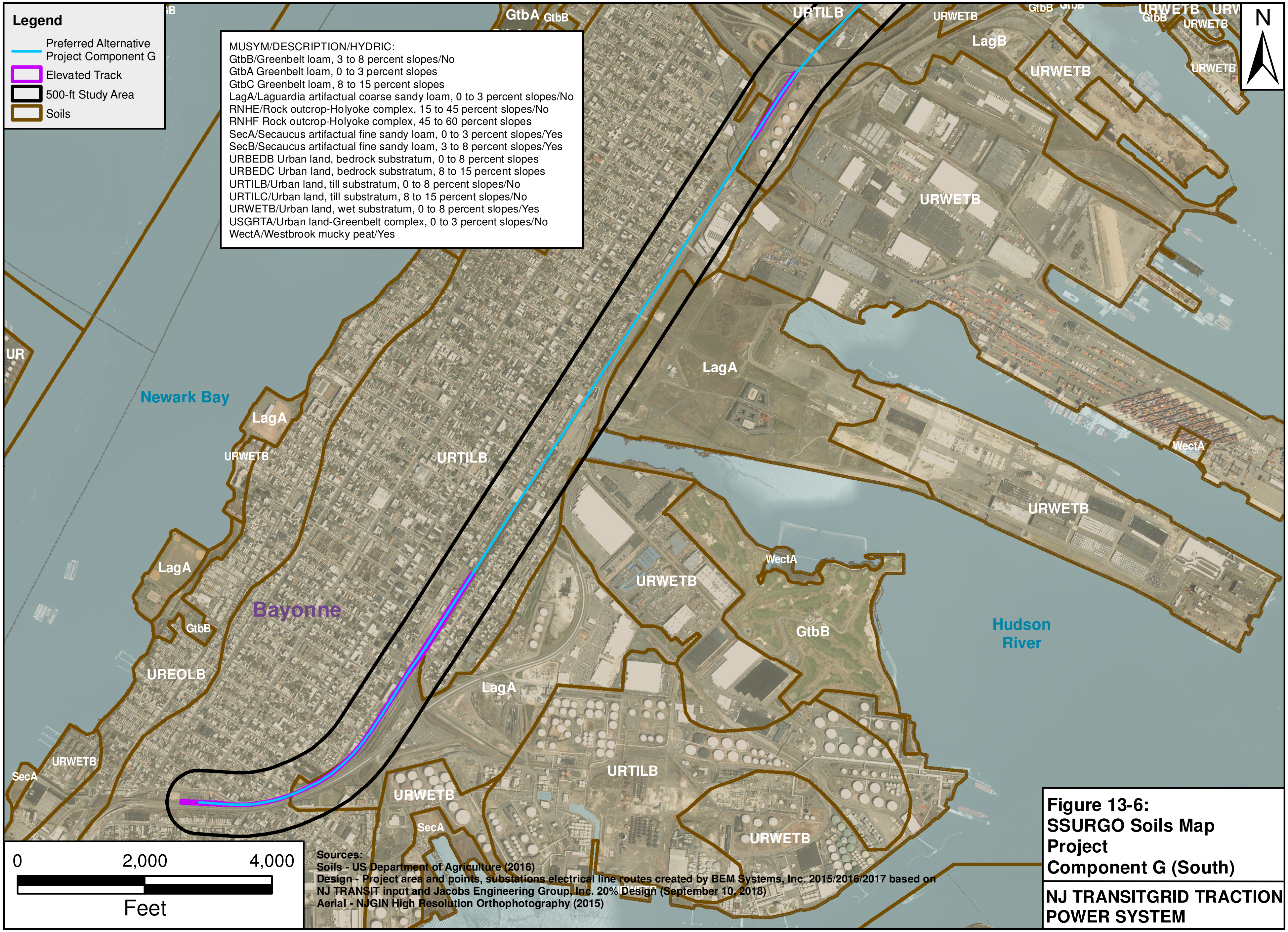

Figure 13-6: SSURGO Soils Map Project Component G (South)

NJ TRANSITGRID TRACTION POWER SYSTEM

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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 artifactual 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 artifactual 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 artifactual 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.

Chapter 14 Contaminated Materials

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 2007[14].

[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.

<u>Project Components A and B</u>

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.

Chapter 15 Utilities

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

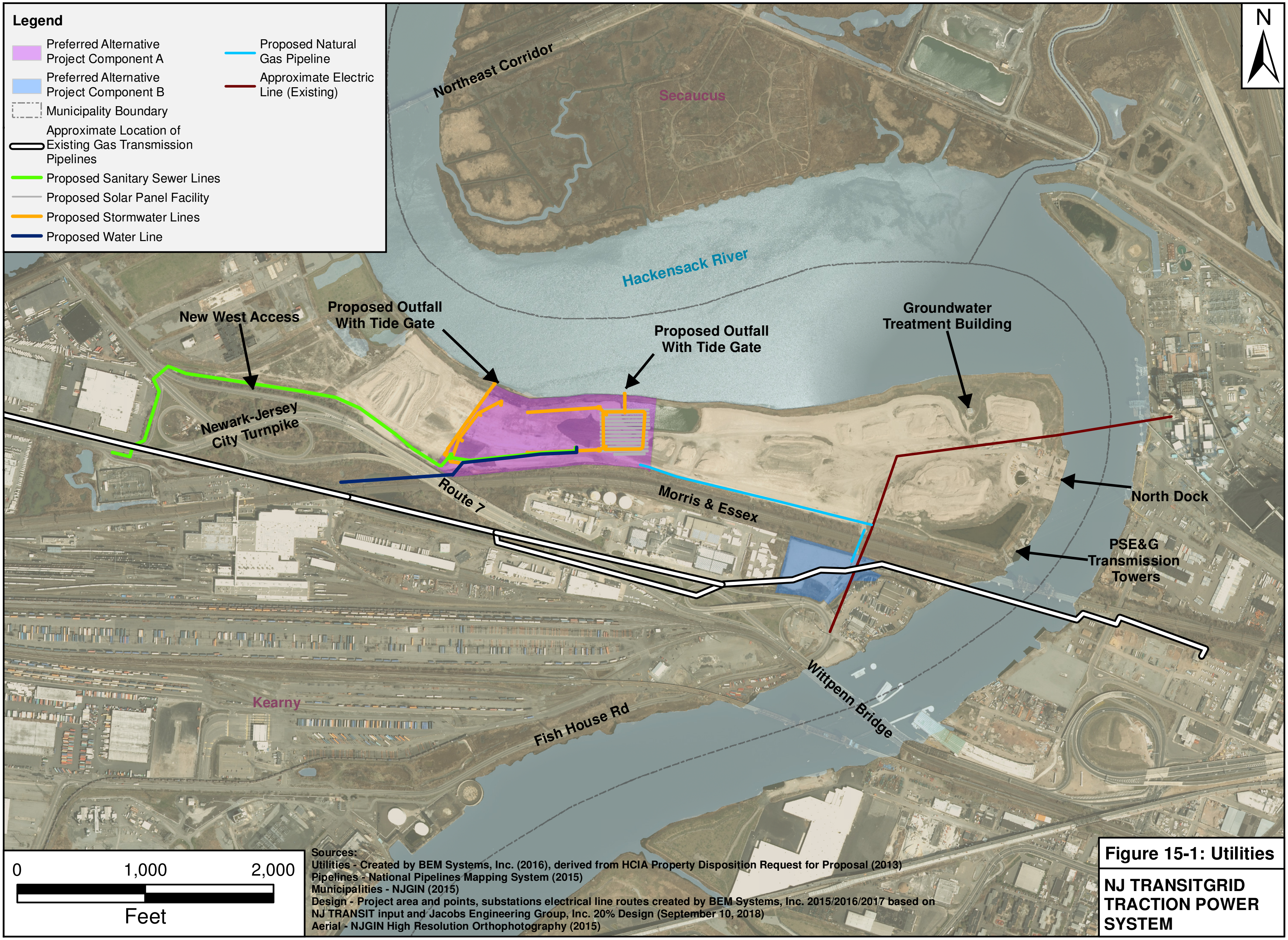

Figure 15-1: Utilities

NJ TRANSITGRID TRACTION POWER SYSTEM

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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-arce 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.

Chapter 16 Safety and Security

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 values 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/m[18]).

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	• Fire/Explosion
	• Potential to affect other components through effects of fire
		• Emergency Shut-off Valves
		• Properly Sized and Constructed Conduit
		• Worker Training
			• Involved Workers
			• Non-involved Workers
			• General Public
			  ○ Commuters
			  ○ Community Responders

Natural Gas Turbines	• Fire/Explosion	• Emergency Shut-off Valves
		• Operation Within Specifications
		• Worker Training
		• Regular Maintenance
			• Involved Workers
			• Non-involved Workers
			• General Public
			  ○ Commuters
			  ○ Community Responders

Air Quality System (Ammonia)	• Hazardous Material Leak
	  ○ Air Quality
	  ○ Water Contamination
		• Modern and Reinforced Containment Tanks
		• Spill Prevention Dam
		• Location on Grounds, not Interior
		• Worker Training
			• Involved Workers
			• Non-involved Workers
			• General Public
			  ○ Commuters
			  ○ Community Responders

Heat Recovery; Steam Turbine	• Explosion	• Operation within Specifications • Worker Training • Regular Maintenance	• Involved Workers
Natural Gas-Fired Spark-ignition Internal Combustion Engine and Generator	• Fire/Explosion	• Emergency Shut-off Valves • Operation within Specifications • Worker Training • Regular Maintenance	• Involved Workers • Non-involved Workers
Electrical lines	• Electrical Shock	• Worker Training	• 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 handing.

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.

Chapter 17 Construction Effects

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," HCIA 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 TRANSTIGRID 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.

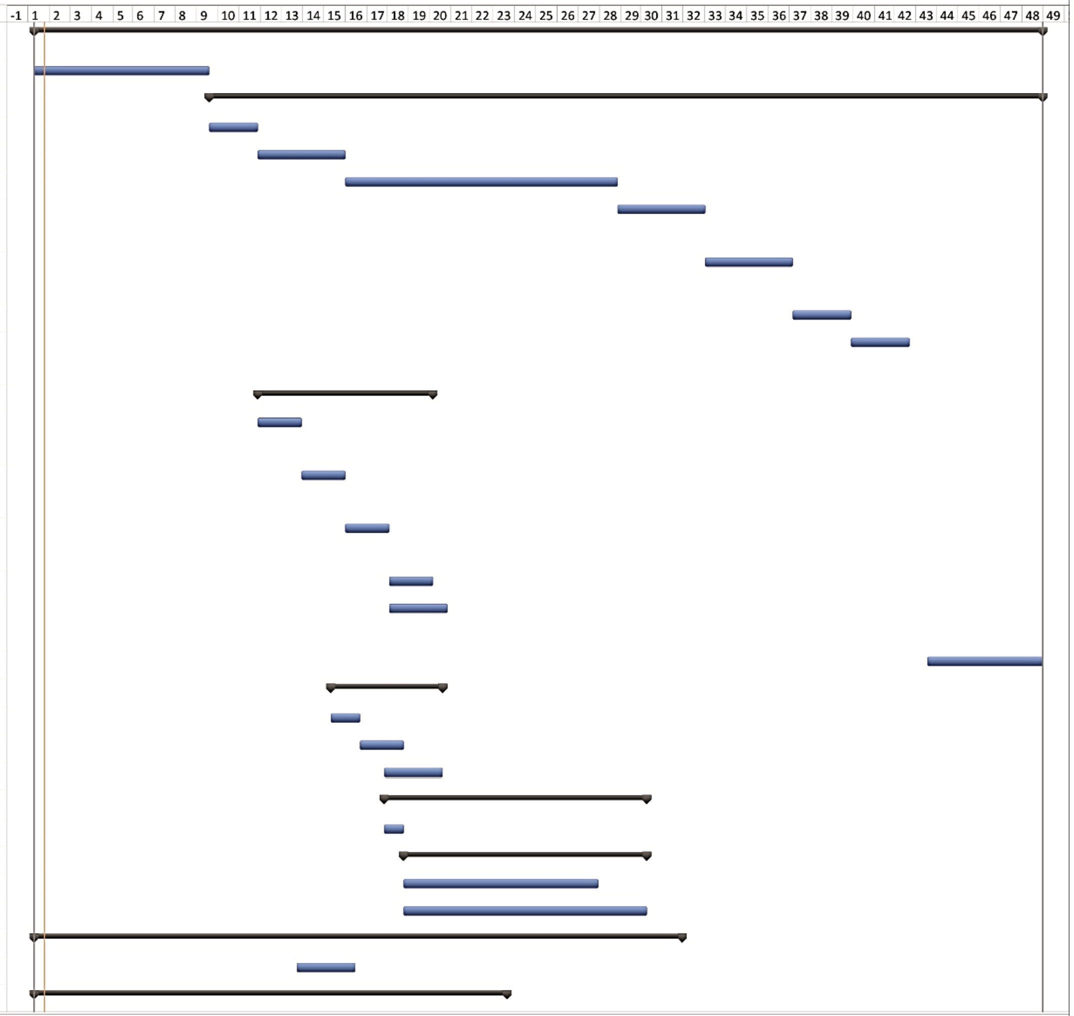
17.2 CONSTRUCTION STAGING, SEQUENCING, AND SCHEDULING

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.

Timescale represents Months after ROD

Table 17-1 - NJ TRANSITGRID TRACTION POWER SYSTEM CONSTRUCTION SCHEDULE

ID	Task Name
1	**NJ TRANSITGRID Construction Schedule**
2	Procurement of specialized long-lead equipment (turbines, etc.)
3	**Project Component A- Main Facility**
4	Mobilization of construction equipment and materials
5	Limited site grading activities
6	Construction of Main Facility building foundation, including pile driving
7	Erection of Main Facility building, separate steel enclosures to house turbines, and other equipment buildings
8	Installation of major facility components such as turbines, storage tanks, pumps, transformers, generators, boilers.
9	Installation of substation switchgear yard equipment
10	Construction and installation of all the structures and equipment for the SFCs
11	*Utility Installation*
12	Underground duct bank construction for installation of utility cable and feeders
13	Installation of sanitary sewer and water supply connections to municipal services
14	Construction of stormwater retention basin and site wide stormwater collection and drainage system
15	Construction of the natural gas pipeline to the Main Facility
16	Construction and installation of all the structures and equipment for the solar facility
17	Commissioning
18	**Project Component B- Natural Gas Pipeline Connection**
19	Mobilization of construction equipment and materials
20	Installation of the gas supply pipeline
21	Installation of a metering station and other infrastructure
22	**Project Component C- Electrical Lines to Mason Substation**
23	Mobilization of construction equipment and materials
24	*Installation of electrical lines*
25	Installation of monopoles
26	Installation of duct banks
27	**Project Component D- Electrical Lines and New Kearny Substation**
28	Mobilization of construction equipment and materials
29	*Construction of Kearny Substation*



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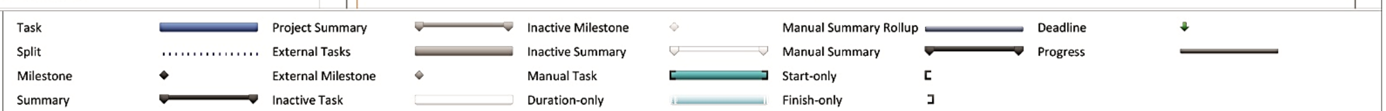
Date: Thu 10/25/18

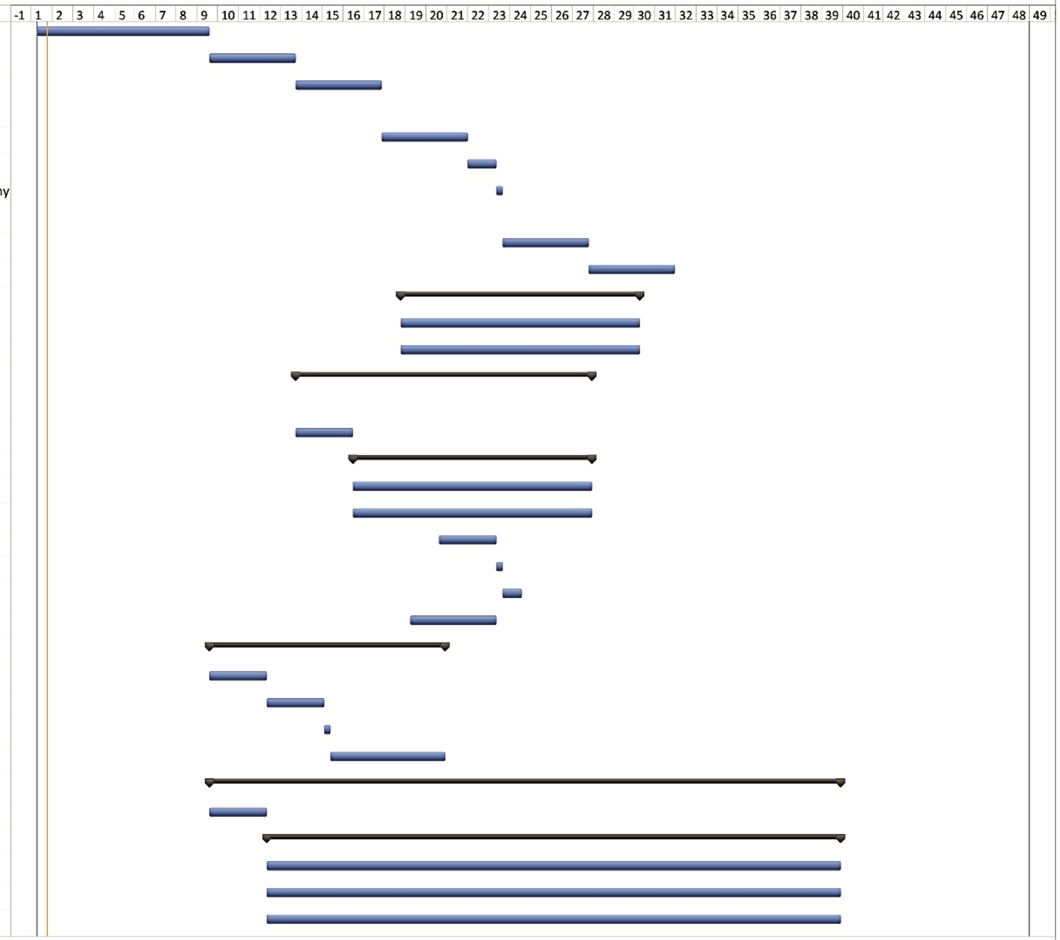


This Construction Schedule is for reference only. Actual sequencing of project actitives is subject to change. The selected construction contractor will be responsible for the final construciton schedule. Construction durations are estimates only.

Timescale represents Months after ROD

Table 17-1 - NJ TRANSITGRID TRACTION POWER SYSTEM CONSTRUCTION SCHEDULE

ID	Task Name
30	Procurement of substation equipment
31	Pile driving of concrete piers
32	Construction of elevated platform on concrete piers to support the new equipment
33	Erection of new structural steel framework
34	Installation of substation housekeeping pads and equipment
35	Cutover of circuits from the existing Substation No. 41 to new Kearny Substation
36	Removal of equipment from Substation No. 41
37	Decommissioning of Substation No. 41
38	*Installation of electrical lines*
39	Installation of monopoles
40	Installation of duct banks
41	**Project Component E- Electrical Lines and NJ TRANSITGRID East Hoboken Substation**
42	Mobilization of construction equipment and materials
43	*Installation of electrical lines*
44	Installation of monopoles
45	Installation of duct banks
46	Aerial Crossing or directional drilling to cross Hackensack River
47	Installation of duct banks within Bergen Tunnel
48	Attachment of electrical lines to existing infrastructure
49	Construction of NJ TRANSITGRID East Hoboken Substation
50	**Project Component F- Connection to HBLR South**
51	Mobilization of construction equipment and materials
52	Construction of an elevated platform
53	Installation of emergency generation equipment
54	Connection to HBLR substations
55	**Project Component G- Hudson Bergen Light Rail**
56	Mobilization of construction equipment and materials
57	*Installation of electrical lines*
58	Installation of monopoles
59	Installation of duct banks
60	Attachment of electrical lines to existing infrastructure



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Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

This Construction Schedule is for reference only. Actual sequencing of project actitives is subject to change. The selected construction contractor will be responsible for the final construciton schedule. Construction durations are estimates only.

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 (PM_{10}) 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.

Chapter 18 Indirect and Cumulative Effects

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 form 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.

<u>Wetlands</u>

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.

<u>Water Quality</u>

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.

Chapter 19 Environmental Justice

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.

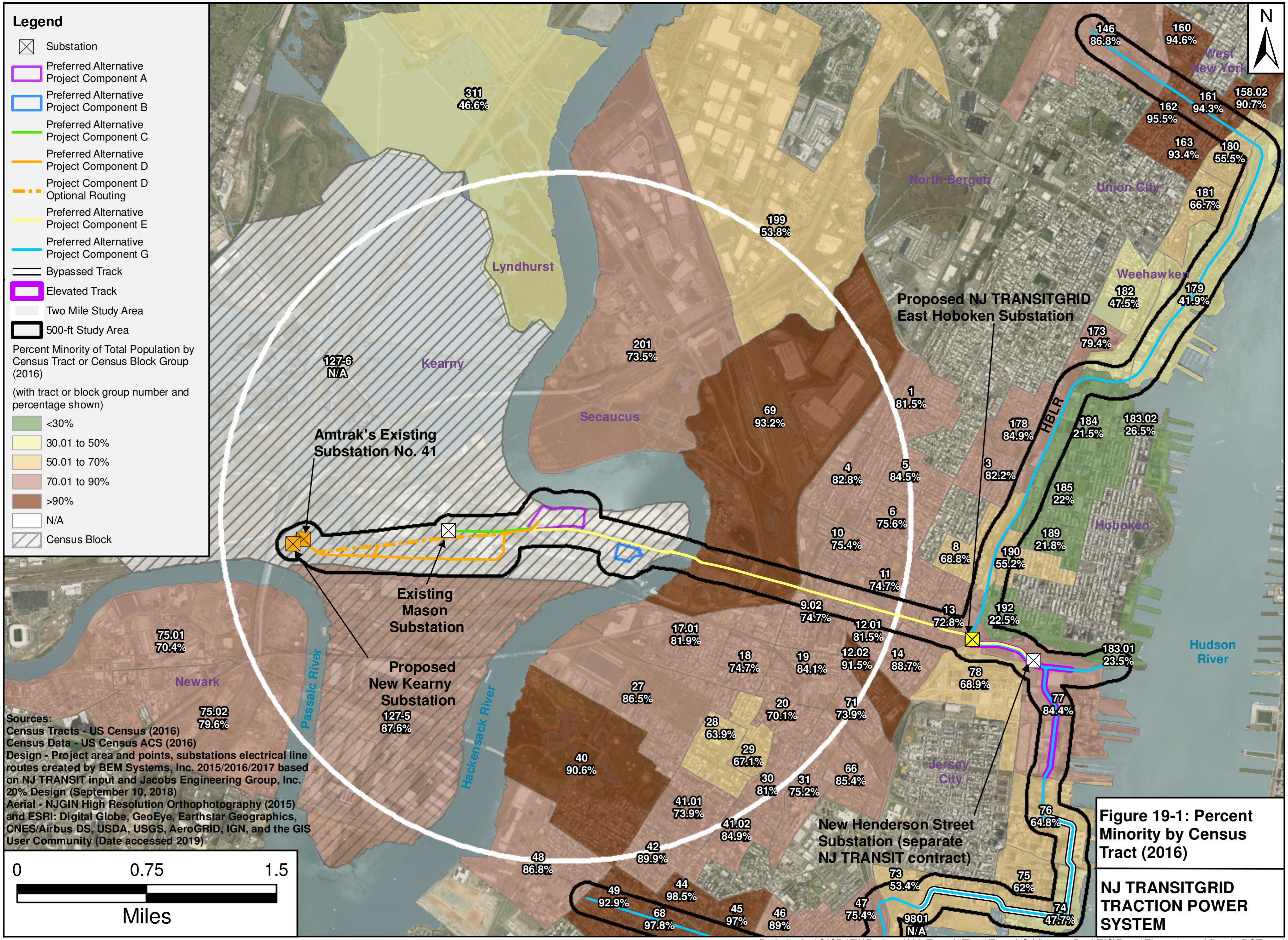

Figure 19-1: Percent Minority by Census Tract (2016)

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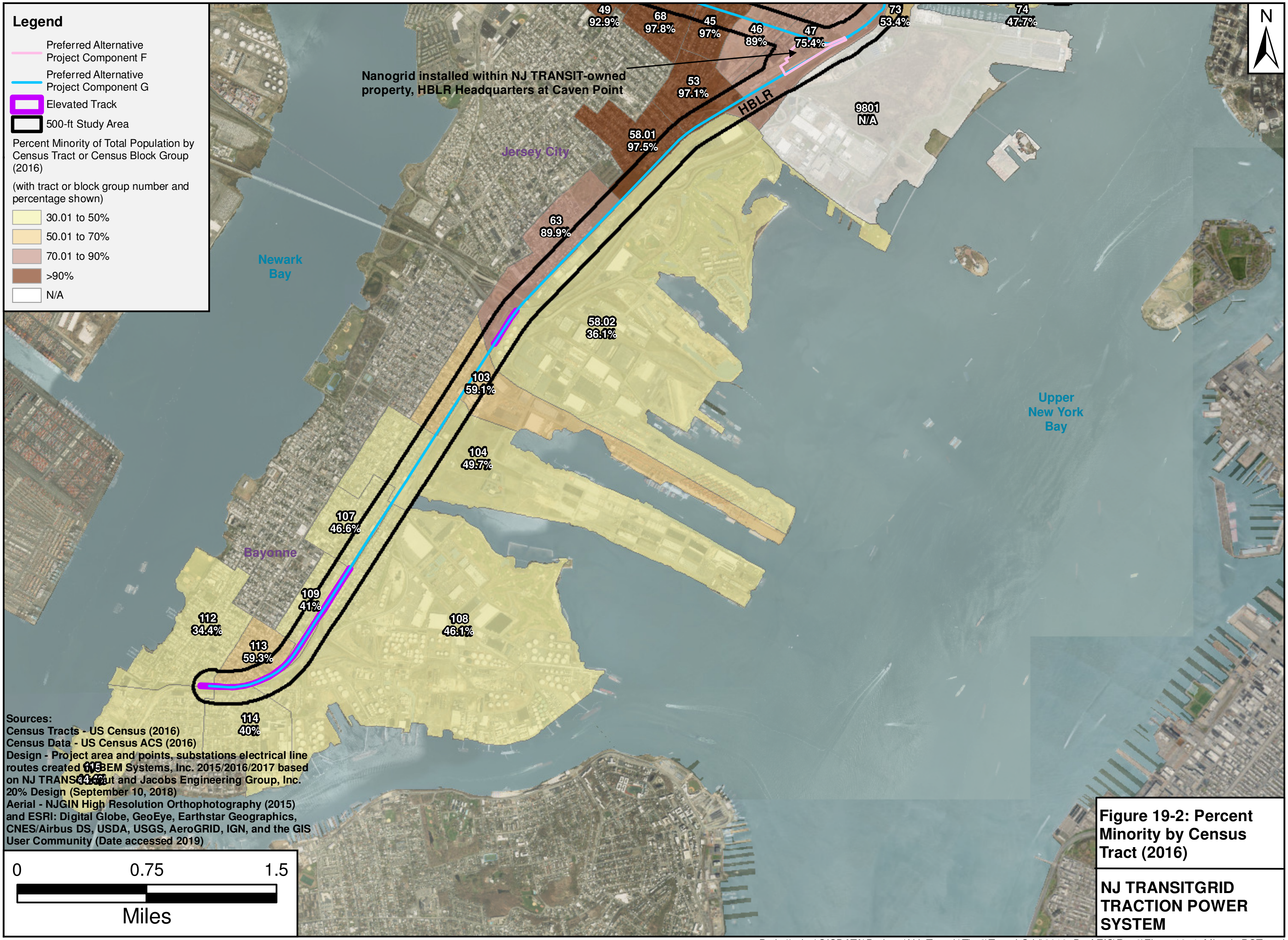

Figure 19-2: Percent Minority by Census Tract (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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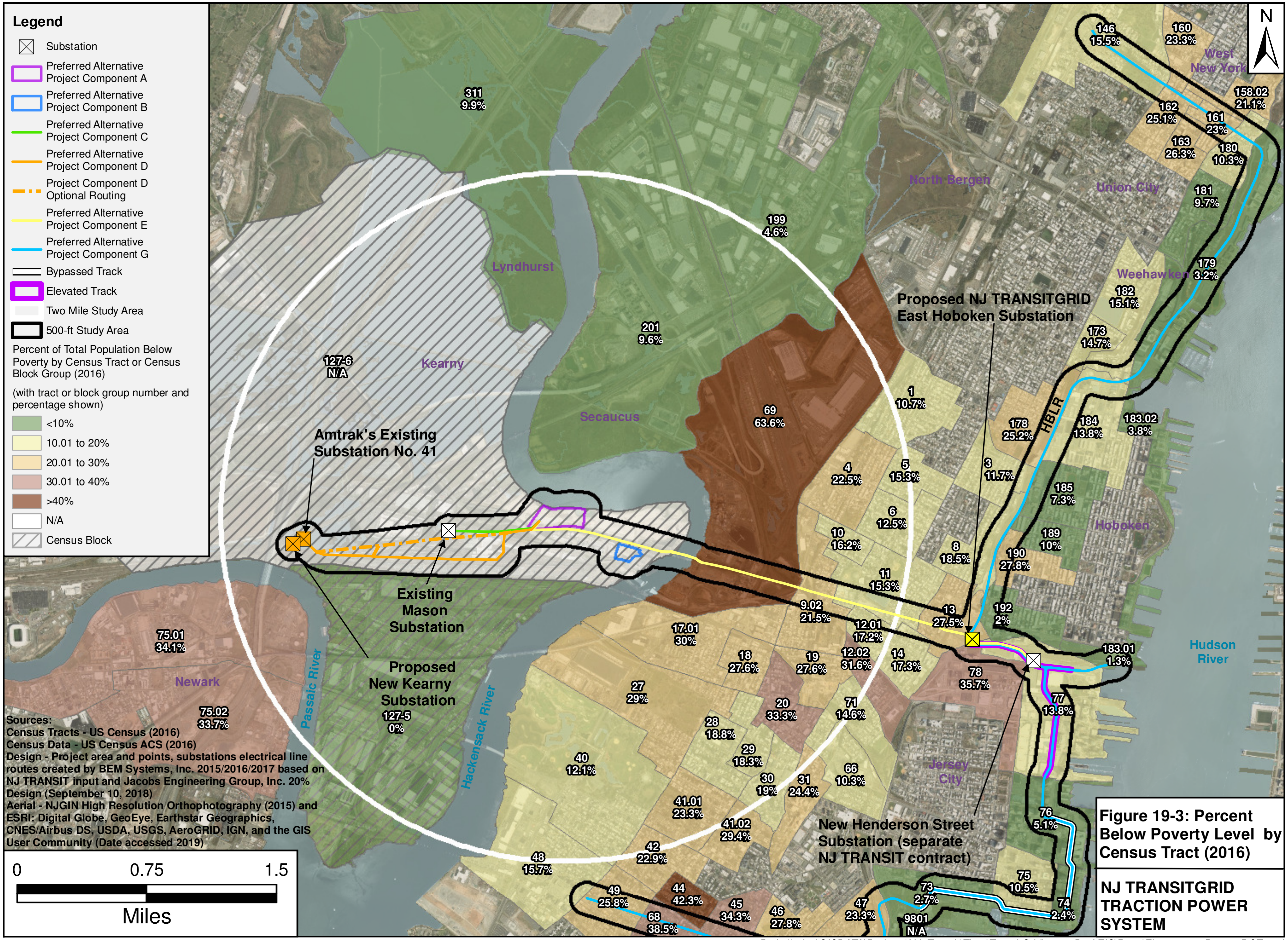

Figure 19-3: Percent Below Poverty Level by Census Tract (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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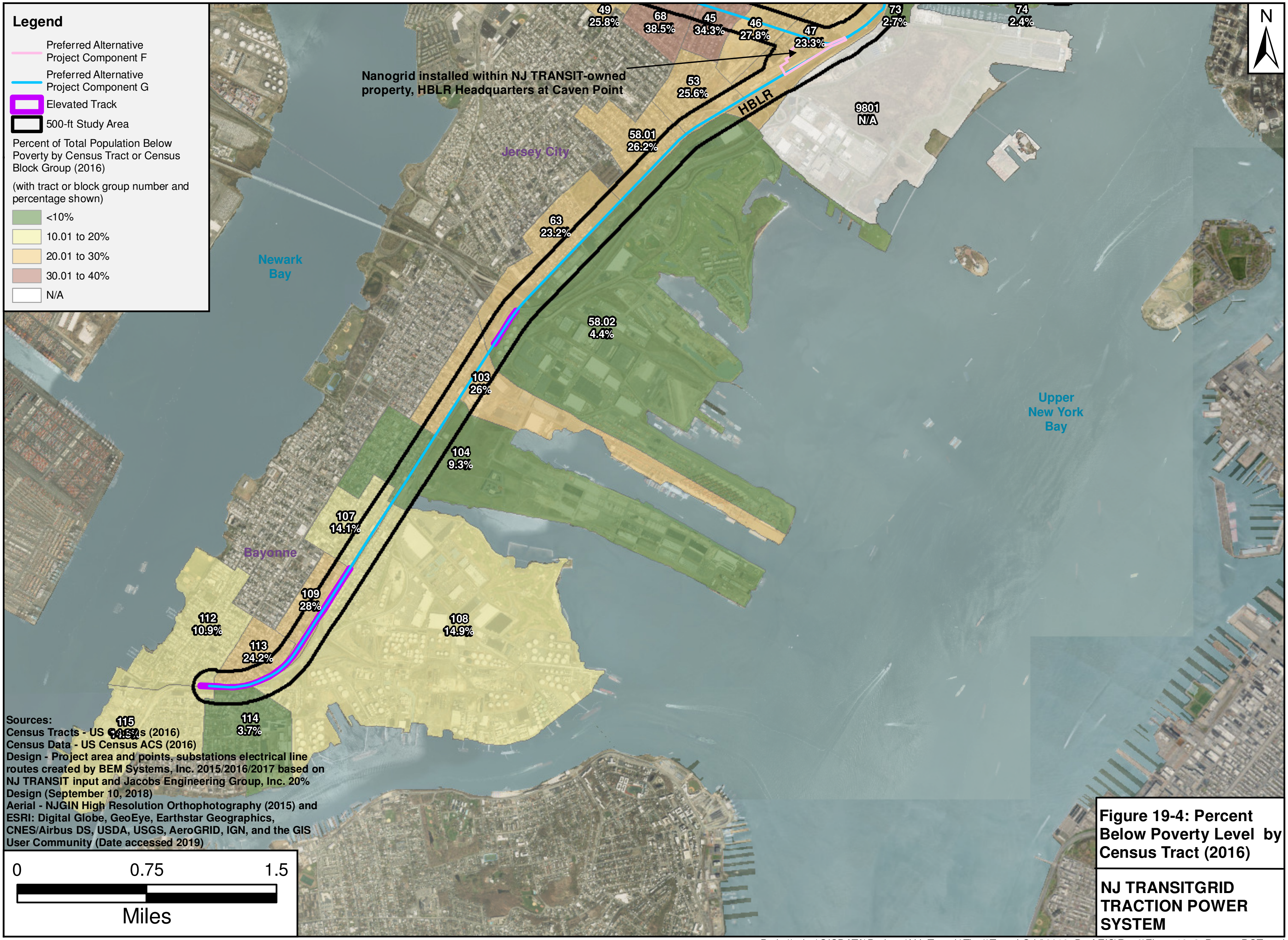

Figure 19-4: Percent Below Poverty Level by Census Tract (2016)

NJ TRANSITGRID TRACTION POWER SYSTEM

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Table 19-1 Population and Economic Characteristics

Geographic Area	Race and Ethnicity[18] 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	Individuals Below Poverty Level
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	%	%
Town of Kearny Census Block Group and Total[19]																			
Census Tract 127, Block Group 5	832	103	12.4	340	40.9	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
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
Jersey City Census Tracts and Total																			
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.	%	%	%
Jersey City Census Tracts and Total																			
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.	%	%		%
Jersey City Census Tracts and Total																				
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.	%	%	%
Jersey City Census Tracts and Total																			
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 Total[20]																			
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	2016 Total	Race and Ethnicity[18]																	Individuals Below Poverty Level
		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.	%	%	%
City of Bayonne Census Tract and Total																			
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
Town of Union City Census Tract and Total																			
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.	%	%	%
Town of Secaucus Census Tract and Total																			
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
Regional and State Comparison																			
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 vortechnics 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 stormsurge 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 G.

Chapter 20 Section 4(f) Evaluation

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 - 5 natural gas turbines (21MW to 25MW each) 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: - 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 - 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 in 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 McGuiness 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

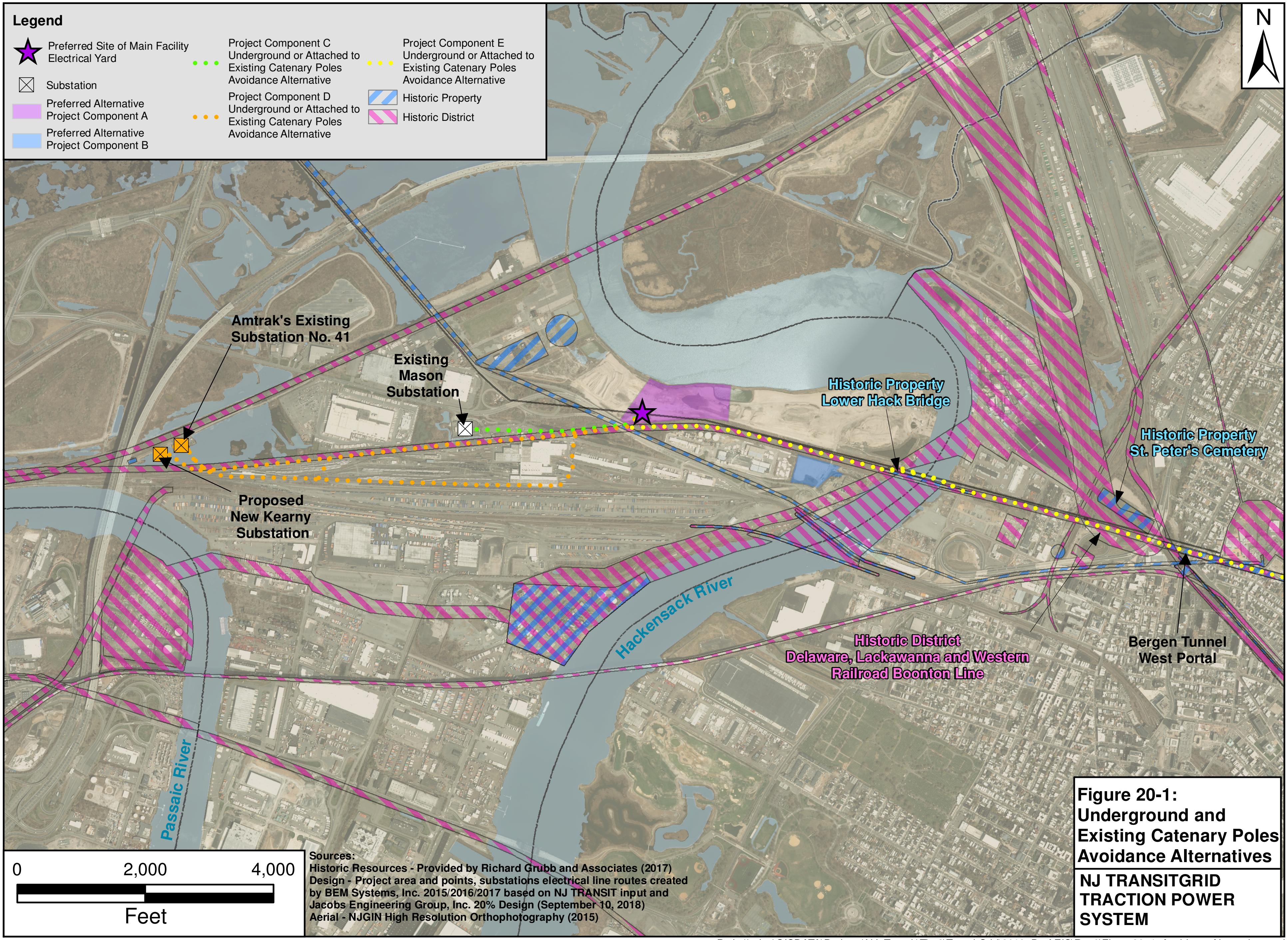
As discussed in Section 20.5.1, the Build Alternative would result in the Section 4(f) use of the Old Main DL&W Railroad Historic District. Therefore, an avoidance alternative analysis has been prepared, in accordance with 23 C.F.R. § 774.17 & 774.3(c) (2008). An “avoidance alternative” is an alternative 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.



Sources:
Historic Resources - Provided by Richard Grubb and Associates (2017)
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)

Figure 20-1: Underground and Existing Catenary Poles Avoidance Alternatives

NJ TRANSITGRID TRACTION POWER SYSTEM

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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.

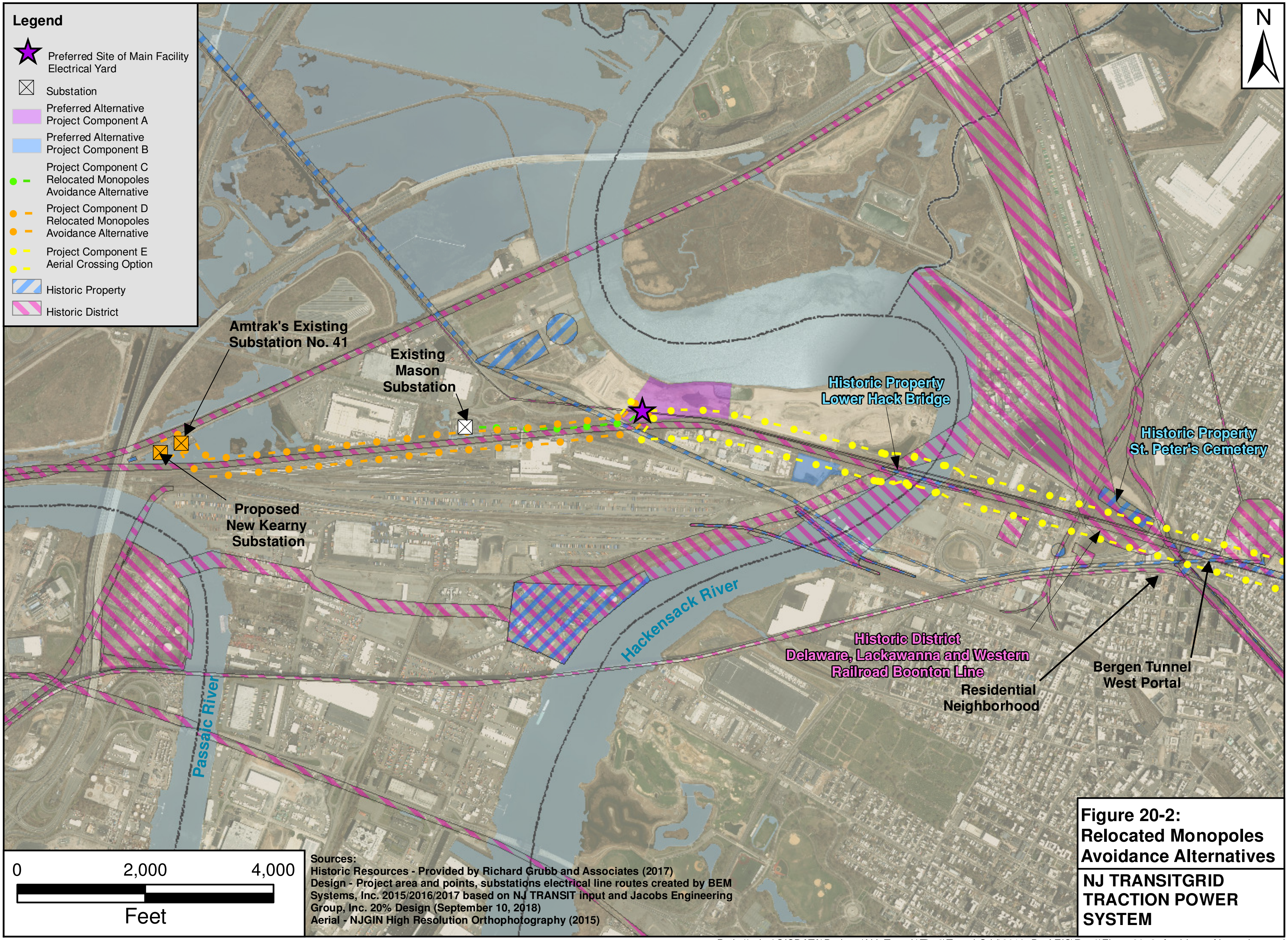

Figure 20-2: Relocated Monopoles Avoidance Alternatives

NJ TRANSITGRID TRACTION POWER SYSTEM

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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. *trifialt*) 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.

Chapter 22 Commitment of Resources

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 million[23]. 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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PROJECT PROGRAMMATIC AGREEMENT

Among

Federal Transit Administration (FTA)
New Jersey Transit Corporation (NJ TRANSIT)
New Jersey State Historic Preservation Office (NJ SHPO)

Regarding the
NJ TRANSITGRID Traction Power System
Hudson County, New Jersey

WHEREAS, NJ TRANSIT is proposing to construct the NJ TRANSITGRID Traction Power System project (or "the Project"), including a microgrid (hereinafter the "Central Power Plant") within a preferred site location at the Koppers Koke Site in the Town of Kearny, Hudson County, New Jersey, in order to enable trains to operate during a commercial grid outage on portions of the NJ TRANSIT and the National Railroad Passenger Corporation (Amtrak) systems, including some sections of the Northeast Corridor, Morris & Essex Line, and the Hudson-Bergen Light Rail (HBLR) Transit System;

WHEREAS, the Project involves the construction of a microgrid that will consist of an approximately 104 to 140-megawatt natural gas-fired electric power generating plant and project-related substations, transformers, and frequency converters on a preferred site location consisting of an approximately 20-acre parcel in the Koppers Koke Site with interconnections to existing high-pressure natural gas pipelines and a new metering station to be installed within a six-acre parcel located south of the Morris & Essex Line, the construction of a new traction power substation (the new Kearny Substation) to replace Amtrak's existing Substation No. 41, the construction of a new NJ TRANSIT substation (the NJ TRANSITGRID Hoboken East Substation), and the construction of electrical transmission lines of varying sizes in either in-ground duct banks or above ground monopoles including approximately 5 miles of lines linking the Central Power Plant site to the NJ TRANSIT Mason Substation, Amtrak's new Kearny Substation, and Henderson Street Substation; and 14.4 miles of new feeder lines that will connect the NJ TRANSITGRID Hoboken East Substation with HBLR substations;

WHEREAS, NJ TRANSIT is the Project sponsor and the Federal Transit Administration (FTA) is serving as the NJ TRANSITGRID lead federal agency pursuant to the National Environmental Policy Act ([NEPA], codified as 42 U.S.C. § 4321 et seq. (1969)), and is the federal agency responsible for compliance with Section 106 of the National Historic Preservation Act of 1966 (formerly at 16 U.S.C. § 470f, as amended at 54 U.S.C. § 300101 et seq. (2016), and hereinafter "Section 106");

WHEREAS, pursuant to 36 CFR. § Part 800.4, FTA and NJ TRANSIT, in conjunction with the New Jersey State Historic Preservation Office (NJ SHPO), have identified the Area of Potential Effects (APE) for the Project, and determined that the APE will be the areas where potential effects on historic properties caused by the Project may occur (see Attachment 1.A through 1.C);

WHEREAS, historic properties within the APE were identified and evaluated by NJ TRANSIT in consultation with FTA and NJ SHPO as documented in the *Historic Architectural Resources Background Survey* (HARBS) and *Effects Assessment* (EA) Report (RGA, Inc. 2017a), Phase IA

Archaeological Survey (Phase IA) (RGA. Inc. 2017b) and supplemental cultural resource submissions (RGA, Inc. 2017c and 2017d) prepared for the Project. As part of this process, FTA and NJ TRANSIT identified properties that appear to meet the criteria for listing in the National Register of Historic Places in 36 CFR § Part 63 (herein "Historic Places Criteria"), and for which NJ SHPO has rendered determinations of eligibility and, therefore, qualify for Section 106 protection. FTA, in consultation with NJ SHPO, has also determined that these properties constitute Historic Resources and qualify for Section 106 protection (see Attachment 2);

WHEREAS, as documented in a letter from Katherine Marcopul (Deputy State Historic Preservation Officer, NJ SHPO) to Dara Callender (Manager, Environmental Compliance, Environment, Energy and Sustainability Unit, NJ TRANSIT) dated April 24, 2018 (see Attachment 3), FTA and NJ TRANSIT, in consultation with NJ SHPO, have identified eighty (80) historic resources in the Project APE that qualify for Section 106 protection. These historic resources are described and mapped in the HARBS and EA Report and Phase IA survey completed for this Project;

WHEREAS, FTA has determined that construction of this Project as proposed will adversely affect seven (7) historic resources:

- Old Main Delaware, Lackawanna and Western Railroad Historic District, multiple municipalities (NJ SHPO Opinion: 9/24/1996);
- Lower Hack Draw Bridge, Town of Kearny and City of Jersey City (NJ SHPO Opinion: 9/18/1996);
- Hackensack River Lift Bridges Historic District, Town of Kearny and City of Jersey City (NJ SHPO Opinion: 5/3/2002);
- Old and New Bergen Tunnels, City of Jersey City (NJ SHPO Opinion: 5/8/1998);
- West End Though Truss Bridges, City of Jersey City (NJ SHPO Opinion: 5/8/1998);
- West End Interlocking Tower, City of Jersey City (NJ SHPO Opinion: 1/20/1999);
- Delaware, Lackawanna and Western Railroad Boonton Line Historic District, Eastern Segment (NJ SHPO Opinion: 6/11/2013).

WHEREAS, in accordance with 36 CFR § Part 800.6(a)(1), FTA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation on [INSERT DATE HERE], and the ACHP has chosen [to/not] to participate in the consultation pursuant to 36 CFR § Part 800.6(a)(1)(iii) and (iv); and

WHEREAS, FTA, in consultation with NJ TRANSIT and NJ SHPO, has contacted and consulted with the Tribal Preservation Officers of the Delaware Nation, the Delaware Tribe, the Eastern Shawnee Tribe of Oklahoma and the Shawnee Tribe in accordance with 36 CFR § Part 800.6(a);

WHEREAS, NJ TRANSIT has consulted with the City of Jersey City, the City of Bayonne, the Town of Kearny, the Township of North Bergen, the City of Union City, the City of Hoboken, and the Township of Weehawken, Hudson County;

WHEREAS, FTA, NJ TRANSIT, and NJ SHPO have agreed to enter into a Programmatic Agreement (PA) pursuant to 36 CFR § Part 800.14(b) to implement a series of stipulations to mitigate identified Adverse Effects to above-ground historic architectural resources; to investigate, record, and document resources that will be adversely affected prior to construction; to undertake a comprehensive corridor study of the segment of the Delaware, Lackawanna and Western Railroad Historic District located within the Project area (see Attachment 1.B), including the segment spanning from Substation No. 41 in the Town of Kearny to the Hoboken Terminal (historically, the Erie-Lackawanna Terminal) in the City of Hoboken; to design and install a multi-component historic interpretive display at an appropriate location identified in consultation between NJ TRANSIT and NJ SHPO; and to prepare an archaeological monitoring plan to be approved by NJ SHPO prior to construction and perform archaeological monitoring and documentation in accordance with said plan during construction for NJ SHPO review and concurrence;

NOW, THEREFORE, FTA, NJ TRANSIT, and NJ SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic resources:

STIPULATIONS

FTA and NJ TRANSIT, in consultation with NJ SHPO, shall ensure that the following measures are carried out:

I. PROTOCOLS FOR THE RECORDATION OF HISTORIC ARCHITECTURAL RESOURCES

A. The following resources will be documented in a manner consistent with Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) Level III standards, including the use of digital photography, and be performed by persons meeting the professional qualifications specified in Part V of this PA:

- Old Main Delaware, Lackawanna and Western Railroad Historic District (Segment between the Western Portal of the Bergen Tunnel to the Hackensack River) and (segment between the Hackensack River and the western end of the Project area at the existing Substation No. 41);
- Lower Hack Draw Bridge;
- Old and New Bergen Tunnels (Western Portal);
- West End Though Truss Bridges;
- West End Interlocking Tower;
- Delaware, Lackawanna and Western Railroad Boonton Line Historic District (Eastern Segment), portion within the APE for the undertaking.

The final scope and content of this recordation effort will be determined in consultation with NJ SHPO but will include a discussion of the history and development of each of these resources within the context of the development of the Delaware, Lackawanna and Western Railroad and the broader history of rail transportation in Northern New Jersey.

B. As part of the recordation effort and in consultation with NJ SHPO, NJ TRANSIT shall actively seek out and obtain from the public and from other accessible archival sources, printed, graphic, and photographic information regarding the resources listed above in Section I.A. The compiled information will be evaluated and (as deemed appropriate during consultation) duplicated as part of the recordation documents.

C. NJ TRANSIT will prepare a copy of the recordation documents, described in Section I.A, and will submit such documentation to NJ SHPO for review and comment. Completion of the digital photographic recordation, including NJ SHPO review and approval of same, will occur within six (6) months of the letting the main construction contract and prior to the initiation of any demolition or construction activity. NJ TRANSIT and NJ SHPO will complete all other elements of the recordation within one (1) year of letting the construction contract.

D. NJ TRANSIT will provide archival copies of the final recordation documents to NJ SHPO, the New Jersey State Library, the Rutgers University Special Collections and University Archives, the Kearny Public Library, the Jersey City Public Library, and the Hoboken Public Library. Additional non-archival copies will be furnished to the Steamtown National Historic Site and the Erie-Lackawanna Historical Society.

II. PROTOCOLS FOR A CORRIDOR STUDY

NJ TRANSIT will undertake a comprehensive corridor study of the segment of the Delaware, Lackawanna and Western Railroad Historic District located within the Project area (see Attachment 1.B). This defined segment includes the portion of the historic district spanning from Substation No. 41 in the Town of Kearny to the Hoboken Terminal (historically, the Erie-Lackawanna Terminal) in the City of Hoboken. The resources to be surveyed in depth will be those associated with the historic rail corridor which have not been previously considered in earlier studies (i.e., those resources aside from stations and bridges). These resources include but are not limited to: signal houses, historic catenaries, tunnels, viaducts, rail yards, engine houses, shop buildings, turntables, substations, and interlocking towers. Updated information only on the existence and conditions of the previously surveyed resources (stations and bridges) will also be provided. The corridor study will evaluate the historical significance and integrity of each resource to determine which are contributing elements to the Old Main Delaware, Lackawanna and Western Railroad Historic District.

NJ TRANSIT will provide a copy of the corridor study to NJ SHPO for review. Completion of the study will be initiated within six (6) months of the letting the main construction contract and prior to the initiation of any demolition or construction activity.

III. PROTOCOLS FOR A HISTORIC INTERPRETIVE EXHIBIT

NJ TRANSIT shall design and install a multi-component historic interpretive display at an appropriate location at one of its facilities (example at Hoboken Terminal) in the vicinity of the proposed undertaking. The as-of-yet unidentified location will be selected through consultation between NJ TRANSIT and NJ SHPO and generally will provide the widest possible audience of railroad service consumers. The display will be a designated historic interpretive installation that shall consist of three (3) or four (4) panels or cast plaques either set into the pavement within appropriate landscape surrounds, attached to an existing building or structure, or mounted on one (1) or more kiosks or similar structures. The panels or plaques shall include text blocks, historic maps, and illustrations.

The interpretive exhibit will comprehensively address the history of rail transportation within the New Jersey Meadowlands. This topic will include discussion of the following:

- The challenges of acquiring rights-of-way and constructing embankments, tracks and bridges, the historic significance of the railway approaches to the New York City and the Greater Port of New York/New Jersey;
- The efforts and contributions of the various railroads involved with track construction and railroad operation (including the New Jersey Railroad and Transportation Company, the Central Railroad of New Jersey, the Pennsylvania Railroad, the Morris & Essex Railroad, the Hudson and Manhattan Railroad, the Delaware, Lackawanna and Western Railroad, the Erie-Lackawanna Railroad, the Penn-Central Railroad, the New York, Susquehanna and Western Railroad, the Consolidated Railroad Corporation, PATH and NJ TRANSIT);
- The history of maintenance and operations facilities (particularly the Pennsylvania Railroad's Meadows Yard) located in the Meadowlands which formerly and currently supported rail service;
- The history of the construction and operation of railroad bridges on the lower Passaic and Hudson rivers. The interpretive materials shall identify, map, and briefly discuss the no-longer-extant Newark Turnpike Bridge, the Lower Hack Bridge, the Pennsylvania Railroad Harsimus Branch Freight Bridge, the Pennsylvania Railroad (PATH) Bridge, the Portal bridge, the Dock bridge, the Newark Drawbridge, the NX Bridge, and the Point-No-Point Bridge.
- The interpretive sign will also incorporate the findings of the corridor study completed as part of Stipulation II of this PA and discuss the various types of railroad-related resources identified in the study.

This historic information will be developed and conveyed in a tiered manner which will allow the data to be consumed and enjoyed by patrons of differing levels of interest and educational levels.

NJ TRANSIT will provide a copy of the design and proposed content for the panels or plaques of the interpretive exhibit to NJ SHPO for review and comment. The design and content of the panels or plaques will be completed within twelve (12) months of the letting the main construction contract.

The interpretive exhibit shall remain in place and be maintained in good order by NJ TRANSIT for a period of at least ten (10) years. NJ TRANSIT shall replace or repair any damaged or faded exhibit panels or plaques during that period. If due to changing plans or railroad improvements, it should become necessary to relocate the display to a new location, NJ TRANSIT shall consult with NJ SHPO to identify an appropriate new site and shall reinstall the display within three (3) months of its removal from its original location.

IV. PROTOCOLS FOR ARCHAEOLOGICAL MONITORING

A plan for archaeological monitoring and documentation during construction shall be developed and submitted to NJ SHPO for review and approval prior to the commencement of construction. Archaeological monitoring is necessary for the installation of utilities and duct banks within areas of archaeological sensitivity as defined in the report entitled, *Supplemental Information for the Phase IA Archaeological Survey (Phase IA), NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey* (RGA, Inc. 2017d) and within the limits of the National Register-eligible New Jersey Junction Railroad-to-Newark-Avenue Iron Viaduct (Substructure Only). The archaeological monitoring and documentation plan shall include:

1) A provision that all work related to the archaeological monitoring and documentation of the site is performed by an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards (36 CFR 61);

2) A protocol (i.e. archaeological monitoring work plan) outlining the responsibilities of FTA, NJ TRANSIT and NJ SHPO with respect to the archaeological monitoring and documentation to be performed during construction;

3) A provision that the archaeological monitoring report and documentation will conform to the *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office* (2000) and the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. The draft archaeological monitoring report shall be submitted to the NJ SHPO within six (6) months from the completion of archaeological monitoring.

In addition, FTA and NJ TRANSIT, in consultation with the archaeological consultant for the Project, shall amend the project plans and specifications to include provisions for the archaeological monitoring and documentation during construction. NJ TRANSIT shall submit that portion of the project plans and specifications to NJ SHPO for review and approval. This section shall include:

a) the name, address, phone number, and e-mail address of the archaeological consultant;

b) the individual who will contact the archaeological consultant;

c) how far in advance of construction the notification will occur; and

d) delineation of which sections of the project will be subject to archaeological documentation

The plan for archaeological monitoring and documentation shall be referenced in the Project documents and be either included or appended to them.

V. PROFESSIONAL QUALIFICATIONS

FTA through NJ TRANSIT will ensure that all work prescribed by this PA is carried out by/under the direct supervision of a person or persons meeting at a minimum the appropriate Secretary of the Interior's Professional Qualifications Standards and Guidelines set forth in 48 FR § 44738-44739.

VI. CHANGES IN PROJECT DESIGN

Should any plan, scope of service, or other document that has been reviewed and commented on pursuant to this PA be altered (except to finalize documents commented on in draft form), the parties to this PA shall be afforded the opportunity to review the proposed change and determine whether or not it will require that this PA be amended. FTA, through NJ TRANSIT, will furnish to NJ SHPO a plan sheet or design sketch showing the proposed change; a written description of why the change is needed, effects to historic properties, if any; and a description of alternatives considered to achieve the same goals, if needed. NJ SHPO will provide written comments to FTA through NJ TRANSIT within fifteen (15) business days of receipt of the documents. If one or more of the signatories determines that an amendment to this PA is needed, then the parties to this PA will consult in accordance with Stipulation XIV below.

VII. CHANGES IN PROJECT AREA/SCOPE

In the event that NJ TRANSIT modifies the geographic boundaries of the Project area, project scope, or any project design subsequent to the approved 100% design review in Stipulation XII below, the following measures will be implemented in consultation with the signatories:

A. NJ TRANSIT, in consultation with FTA and NJ SHPO, will assess and revise the Project APE, as needed, to incorporate any additional areas that have the potential to affect historic resources;

B. NJ TRANSIT, in consultation with FTA, and NJ SHPO, will carry out additional investigations deemed necessary to identify historic architectural and archaeological properties that may be affected;

C. NJ TRANSIT, in consultation with FTA and NJ SHPO, will assess the Project's potential effects on any new historic properties and explore measures to avoid, minimize, or mitigate adverse effects on these properties.

D. NJ TRANSIT, in consultation with FTA and NJ SHPO, will ensure the preparation of appropriate reports and documents, notify Section 106 consulting parties, including Native American tribes, of any changes in the Project's effect on historic properties, and provide an opportunity for review and comment.

E. If a change in project scope results in potential effects to historic places not addressed in this PA, FTA will consult with all consulting parties to amend this PA in accordance with Section XIV below.

VIII. DISCOVERY OF HUMAN SKELETAL REMAINS

If human skeletal remains are encountered anywhere on the Project site, they will be treated in accordance with the current guidelines of the NJ SHPO, and with the applicable provisions of the New Jersey Cemetery Act of 2003, set forth at N.J.S.A. § 45:27-1 et seq. If it is determined that the skeletal remains (and any associated grave artifacts) are Native American, NJ TRANSIT will cease construction, and as soon as possible, consult with NJ SHPO and FTA over applicability and implementation of relevant procedures under the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, set forth at 25 U.S.C. § 3001 et seq. and implementing regulations at 43 CFR § Part 10. FTA will notify Tribal representatives, and construction will not resume until such time as the significance and disposition of said discoveries can be determined.

IX. UNANTICIPATED DISCOVERIES OF ARCHEOLOGICAL RESOURCES

All unanticipated historic and/or prehistoric archaeological discoveries resulting from Project activities made anywhere on the Project site will be treated in accordance with the regulations set forth at 36 CFR § Part 800.11 and CFR § Part 800.13. In the event that unanticipated discoveries of Native American archaeological resources are made during execution of the Project, NJ TRANSIT will cease construction and FTA will notify Tribal representatives. Construction will not resume until such time as the significance and disposition of said discoveries can be determined.

X. MONITORING AND OVERSIGHT

Each year following the execution of this PA until it expires or is terminated (see Section XIII), NJ TRANSIT shall provide all signatories to this PA a summary report detailing work undertaken pursuant to its terms. Such report will include any scheduling changes proposed, any problems encountered, and any disputes and objections received in FTA's efforts to carry out the terms of this PA.

XI. DOCUMENT REVIEW AND REPORTING

NJ SHPO will provide comments on documents they review as set forth below:

A. Unless otherwise stipulated in this PA, NJ SHPO will have up to thirty (30) calendar days to review and comment on all submissions stipulated in this PA, starting from the date of receipt of such documents.

B. If NJ SHPO does not submit comments in writing to NJ TRANSIT and FTA within thirty (30) calendar days of receipt of any plans or reports, it is understood that NJ SHPO has concurred with the submission.

   Engineering Plans to be submitted to NJ SHPO are as follows:

   a. 30% Design
   b. 60% Design
   c. 100% Design

C. If NJ SHPO objects to or recommends revisions to submissions stipulated in this PA, NJ TRANSIT, FTA, and NJ SHPO will consult expeditiously to respond to recommendations and resolve objections.

D. If FTA and NJ TRANSIT cannot resolve NJ SHPO objections, and if further consultation with NJ SHPO is deemed unproductive by any party, the parties will adhere to the dispute resolution procedures detailed under Section XII below.

E. FTA, NJ TRANSIT, and NJ SHPO acknowledge that the timeframes set forth in Section XI.A. above will be the maximum allowable under normal circumstances. In exigent circumstances (such as when construction activities potentially affecting historic and/or architectural resources that are the subject of NJ SHPO or other stakeholder objections or disputes have been delayed pending resolution of said objections or disputes), each party agrees to expedite its respective document review and dispute resolution obligations.

XII. DISPUTE RESOLUTION

A. In the event any signatory or concurring party to this PA objects at any time to any actions proposed or the manner in which the terms of this PA are implemented, FTA and NJ TRANSIT will consult with such party to resolve the objection. If FTA determines that such objection cannot be resolved, FTA and NJ TRANSIT will meet with the objecting party within thirty (30) calendar days to resolve the objection.

B. If after consultation with the objecting party FTA determines that the objection has not been satisfactorily resolved, FTA will, within fifteen (15) days of determination, forward documentation relevant to the dispute to the ACHP.

C. Except in exigent circumstances as provided in Section XI.E above, when a dispute occurs, ACHP will provide FTA with recommendations or comments within thirty (30) calendar days after receipt of pertinent documentation. FTA will take such recommendations or comments into account in reaching a final decision regarding the dispute.

D. Except in exigent circumstances as provided in Section XI.E above, in the event that ACHP fails to respond to FTA's requests for recommendations or comment within thirty (30) calendar days of receiving pertinent documents, FTA may resolve the dispute. Prior to reaching a final decision, FTA will prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the PA and provide them and the ACHP with a copy of such written response.

E. In the case of disputes arising under exigent circumstances (such as when construction activities potentially affecting historic and/or architectural resources that are the subject of NJ SHPO or other stakeholder objections or disputes have been delayed pending resolution of said objections or disputes), relevant parties will endeavor to resolve any dispute within seven (7) calendar days. In particular, ACHP agrees to respond to FTA's request for recommendations or comments within five (5) business days of its receipt thereof.

XIII. DURATION

This PA will expire if its terms are not carried out within ten (10) years from the date of its execution, or upon Project completion or grant closeout, whichever comes first. If within 10 years, the Project is not completed or its stipulations are not met, the signatories will consult to determine if this PA will be amended, extended, or terminated. Prior to such time, FTA through NJ TRANSIT may consult with the other signatories to reconsider the terms of the PA and amend it in accordance with Stipulation XIV below.

XIV. AMENDMENTS

Any signatory to this PA may request at any time that it be amended whereupon the signatories will consult in accordance with 36 CFR § Part 800.14(b) to consider such amendment. Any resulting amendments shall be developed and executed among the signatories in the same manner as the original PA. Any amendment of this PA will go into effect only upon written agreement by all signatories.

XV. TERMINATION

If this PA is not amended as provided for in Section XIV, or if any of the signatories or invited signatories propose termination of this PA for other reasons, the signatory or invited signatory party proposing termination shall, in writing, notify the other signatories to seek alternatives to termination. If within thirty (30) days, or another time period agreed to by all signatories, an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.

Once this PA is terminated, and prior to work continuing on the undertaking, FTA must either (a) execute a PA pursuant to 36 CFR § Part 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § Part 800.7. FTA will notify the signatories as to the course of action it will pursue.

Execution of this PA by FTA, NJ TRANSIT, and NJ SHPO, and implementation of its terms, demonstrate that FTA has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

XV. CONTACT INFORMATION

For purposes of notices and consulting pursuant to this PA, the following addresses and contact information should be used for the respective agencies:

NJ TRANSIT	**FTA**	**NJ SHPO**
Dara Callender Manager, Env. Compliance Environment, Energy and Sustainability Unit NJ TRANSIT One Penn Plaza East Newark, NJ 07105-2246 Tel: 973-491-7205 Fax: 973-863-4538	Dan Moser Community Planner Federal Transit Administration 1 Bowling Green, Room 428 New York, NY 10004-1415 Tel: 212-668-2170 Fax: 212-668-2136	Katherine Marcopul Deputy SHPO NJ Historic Preservation Office P.O. Box 420 Trenton, NJ 08625-0420 Tel: 609-984-5816 Fax: 609-984-0578

References

RGA, Inc.

2017a *Historic Architectural Background Survey (HARBS) and Effects Assessment (EA) Report, NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey*, Volumes I and II. June 2017. On file at the New Jersey State Historic Preservation Office, Trenton, New Jersey.

2017b *Phase IA Archaeological Survey, NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey*. June 2017. On file at the New Jersey State Historic Preservation Office, Trenton, New Jersey.

2017c *Supplemental Information for the Historic Architectural Background Survey (HARBS) and Effects Assessment (EA) report, NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey*, Volumes I and II. December 2017. On file at the New Jersey State Historic Preservation Office, Trenton, New Jersey.

2017d *Supplemental Information for the Phase IA Archaeological Survey (Phase IA), NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey*. December 2017. On file at the New Jersey State Historic Preservation Office, Trenton, New Jersey.

ATTACHMENTS

Attachment 1: Area of Potential Effect (APE);

Attachment 2: Historic Resources

Attachment 3: Katherine J. Marcopul, Deputy State Historic Preservation Officer, NJ SHPO to Manager, Environmental Compliance, Environment, Energy and Sustainability Unit, NJ TRANSIT, April 24, 2018 (HPO Project #14-1685; HPO Log #D2018-122 PROD)

APPROVAL AND SIGNATURE PAGE FOR PROGRAMMATIC AGREEMENT

Among

Federal Transit Administration (FTA)
New Jersey Transit Corporation (NJ TRANSIT)
New Jersey State Historic Preservation Office (NJ SHPO)

Regarding the
NJ TRANSITGRID Traction Power System
Hudson County, New Jersey

FEDERAL TRANSIT ADMINISTRATION

By: ____________________________ Date: ____________________

Stephen Goodman
Regional Administrator, Region II

NEW JERSEY STATE HISTORIC PRESERVATION OFFICE

By: ____________________________ Date: ____________________

Katherine J. Marcopul
Deputy State Historic Preservation Officer

NEW JERSEY TRANSIT CORPORATION

By: ____________________________ Date: ____________________

Eric Daleo
Assistant Executive Director

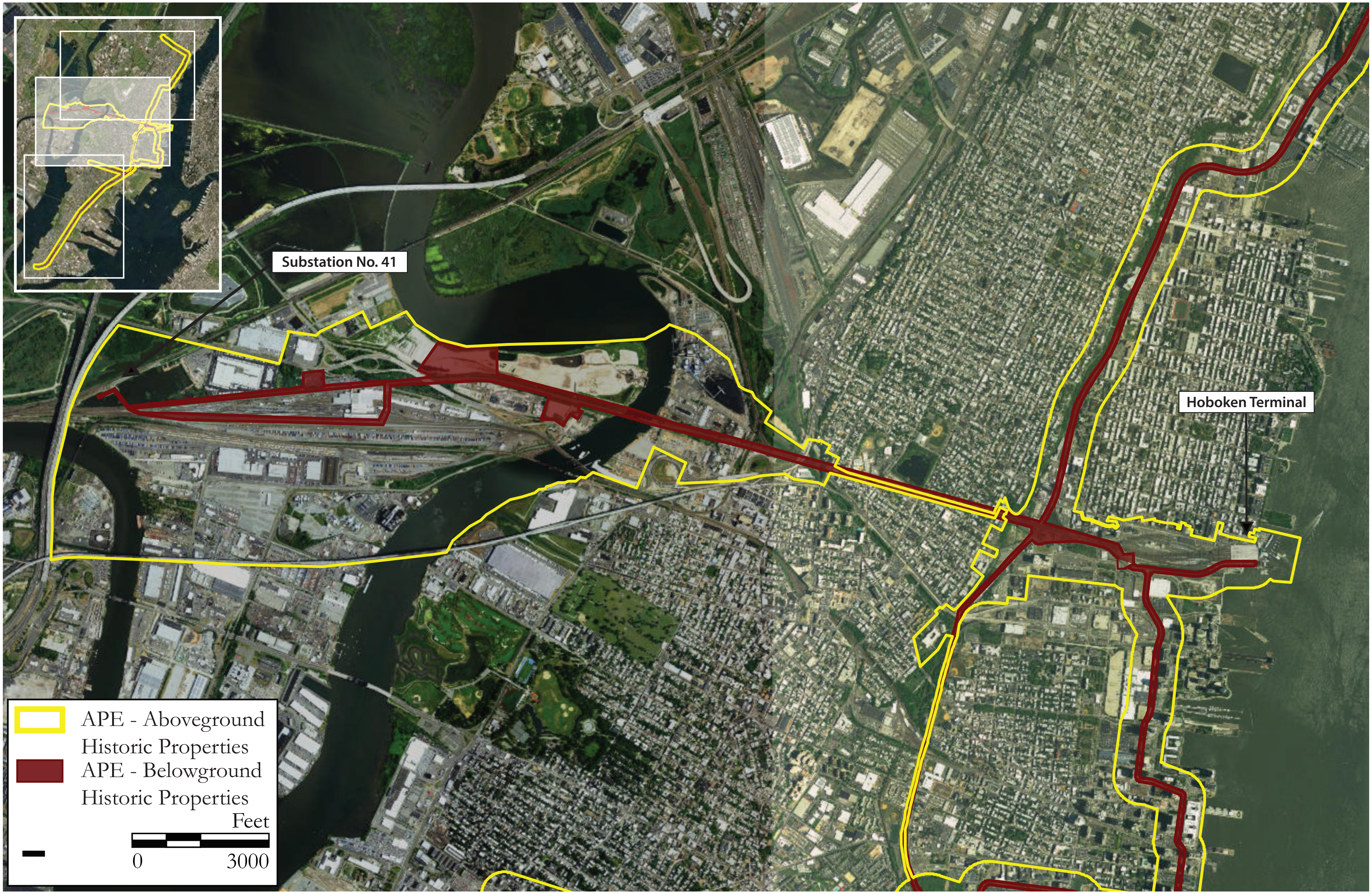
APPROVED AS TO FORM ONLY:

By: ____________________________ Date: ____________________

Gurbir S. Grewal
Attorney General

ATTACHMENT 1

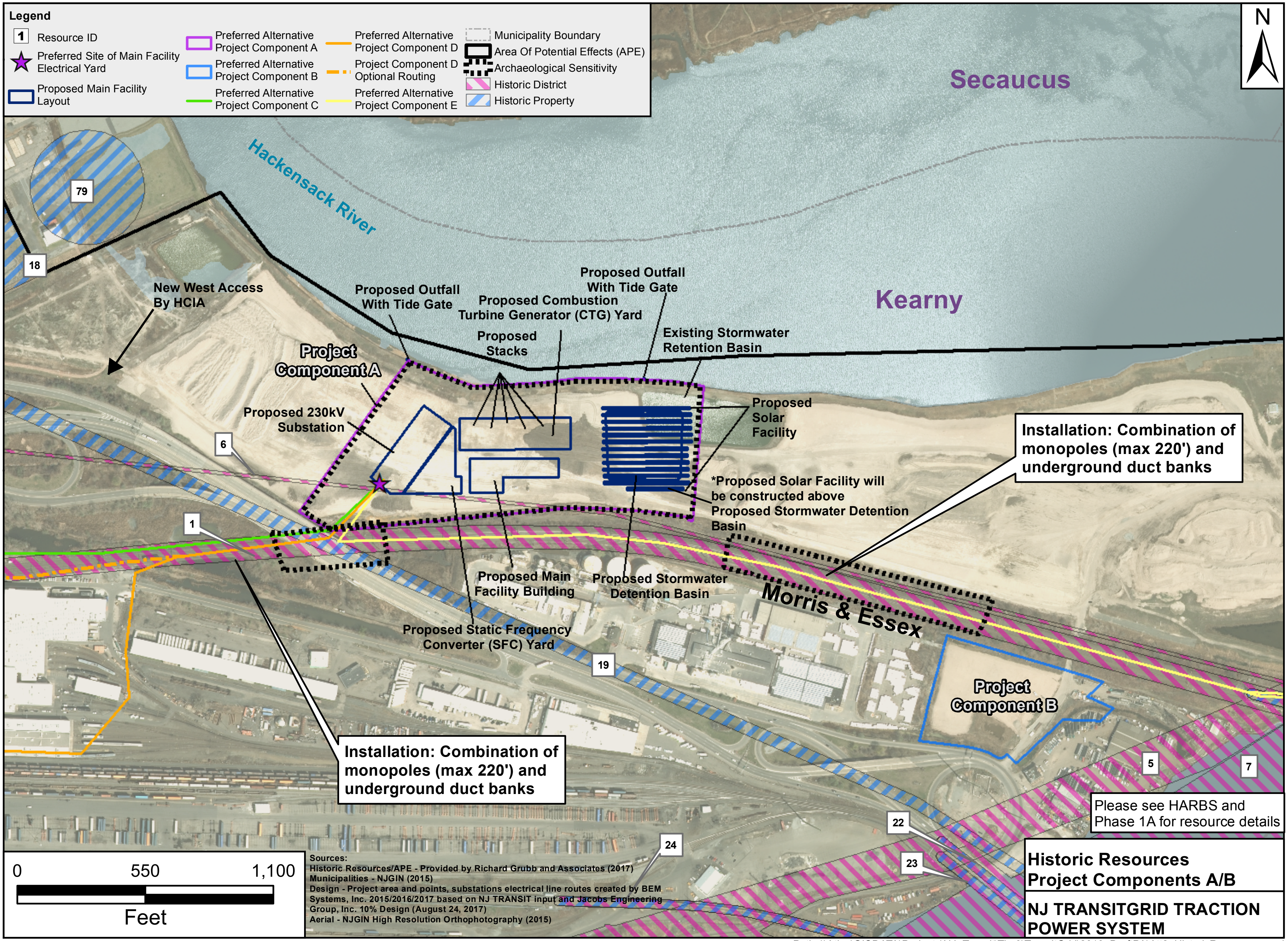
Attachment 1.A: Aerial photograph depicting the APE-Aboveground and the APE-Belowground for Historic Properties (NJGIS Digital Orthographic Imagery, 2012).



Attachment 1.B: Aerial photograph depicting the APE-Aboveground and the APE-Belowground for Historic Properties (NJGIS Digital Orthographic Imagery, 2012).

Attachment 1.C: Aerial photograph depicting the APE-Aboveground and the APE-Belowground for Historic Properties (NJGIS Digital Orthographic Imagery, 2012).

ATTACHMENT 2



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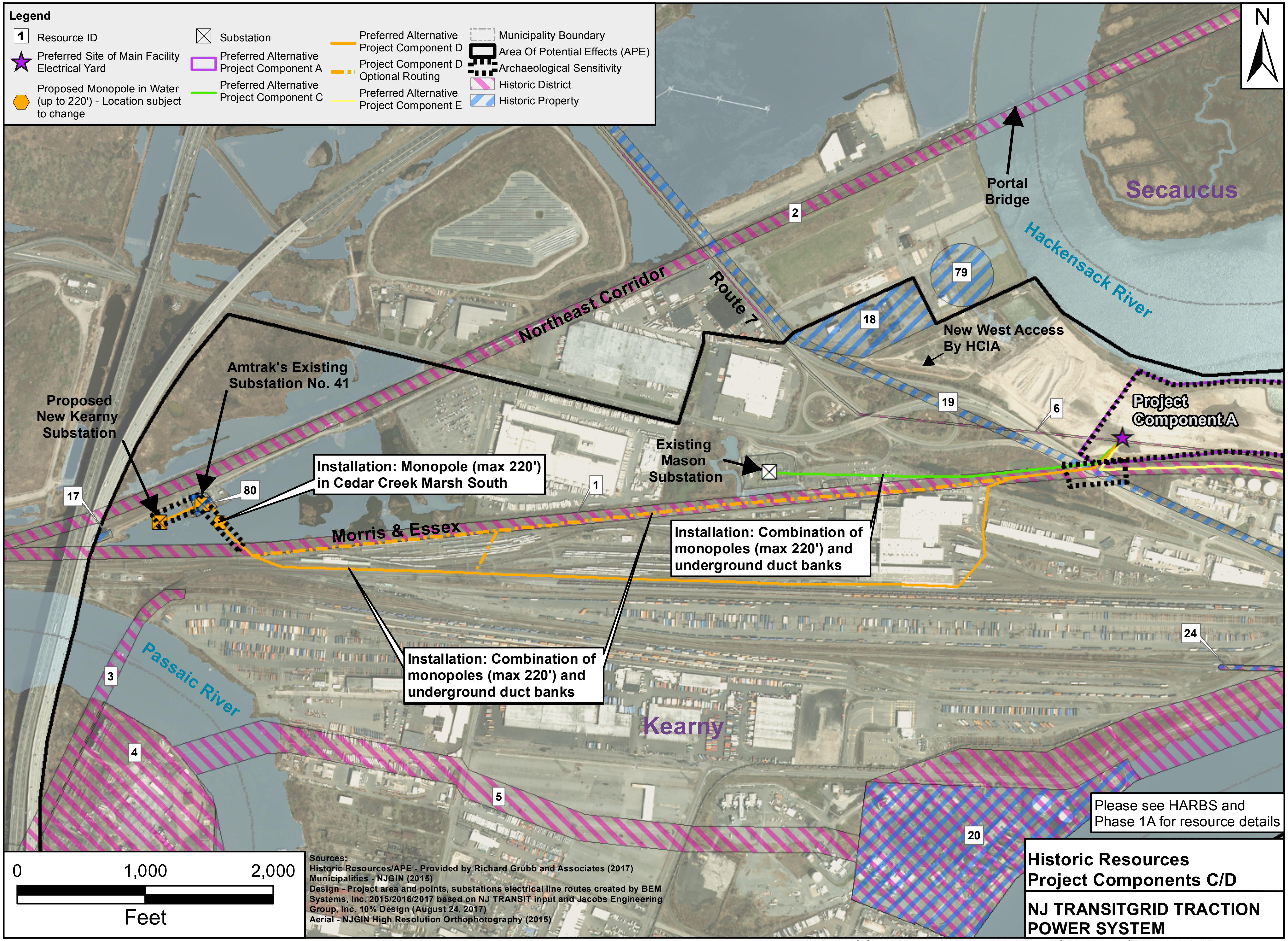

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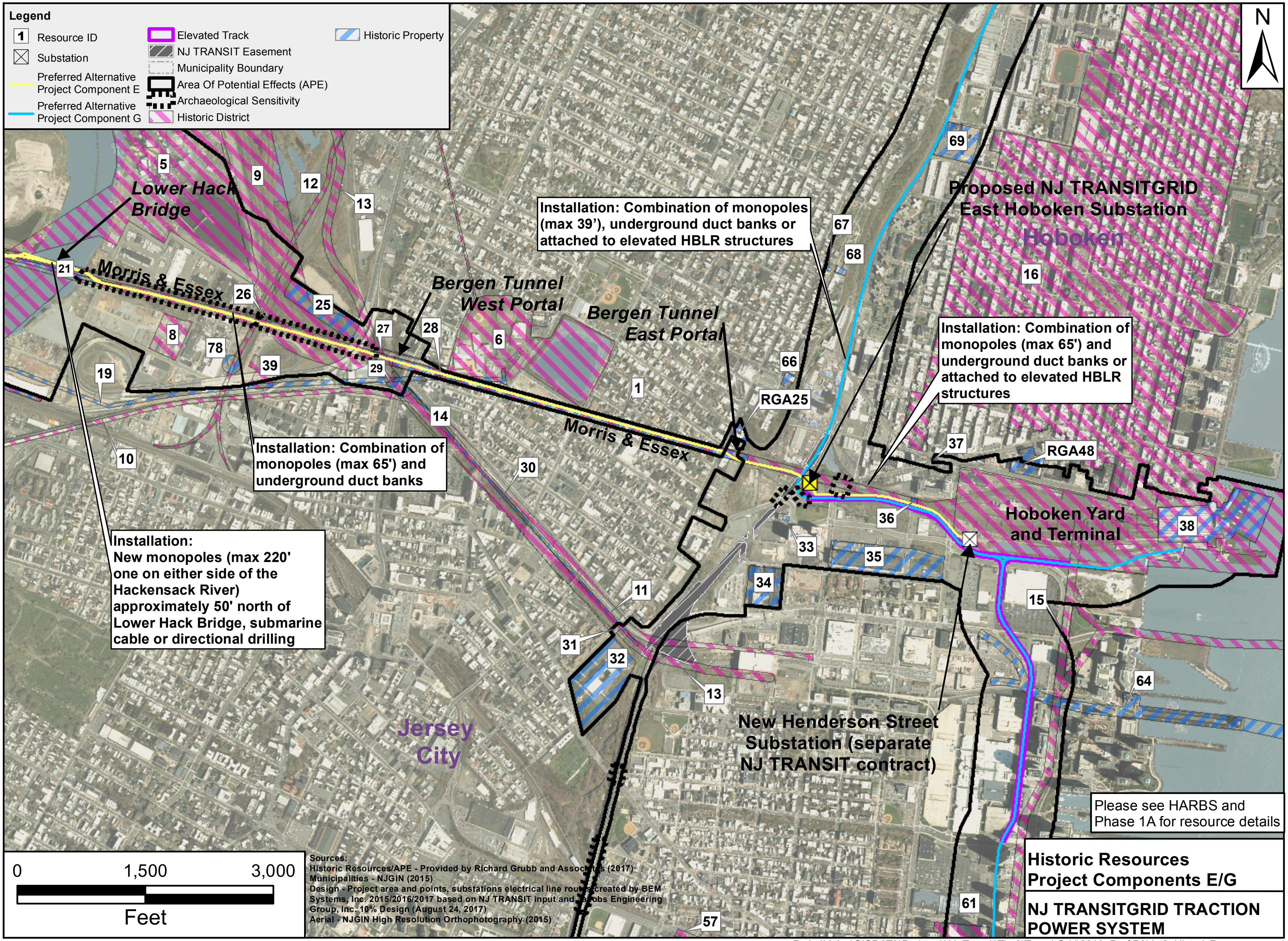

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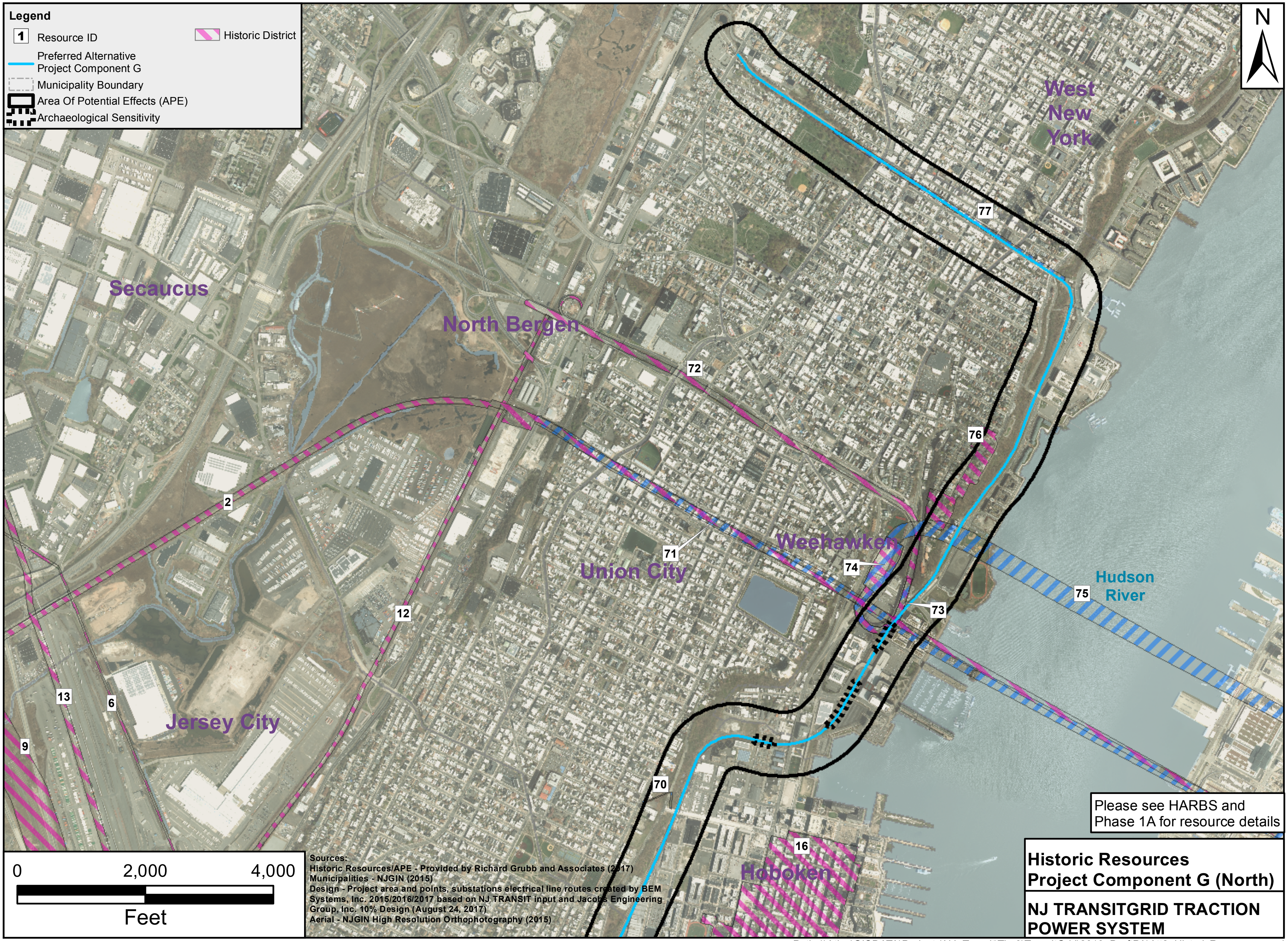

Please see HARBS and Phase 1A for resource details

Sources:
Historic Resources/APE - Provided by Richard Grubb and Associates (2017)
Municipalities - NJGIN (2015)
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. 10% Design (August 24, 2017)
Aerial - NJGIN High Resolution Orthophotography (2015)

Historic Resources
Project Component G (North)

NJ TRANSITGRID TRACTION POWER SYSTEM

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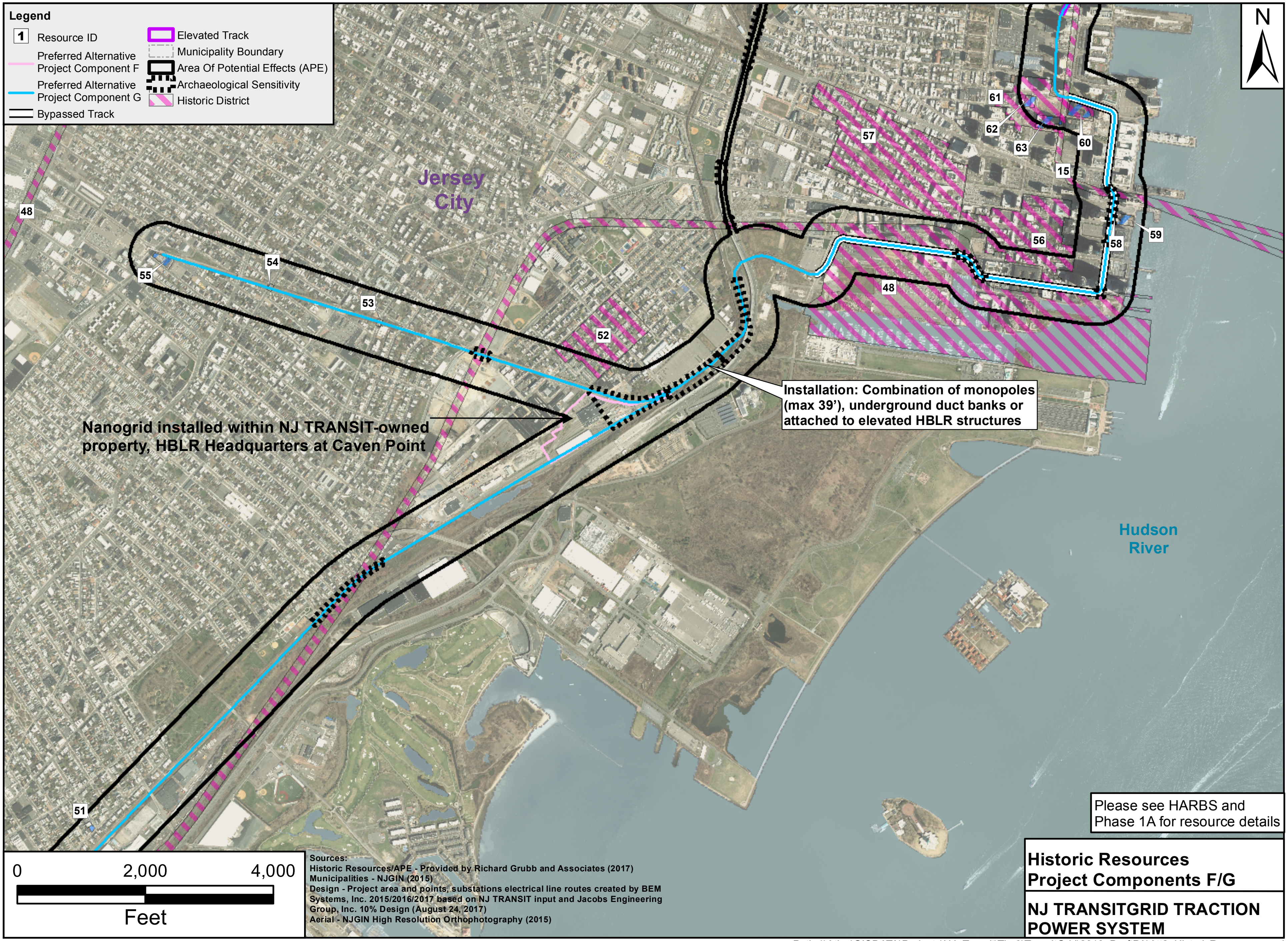

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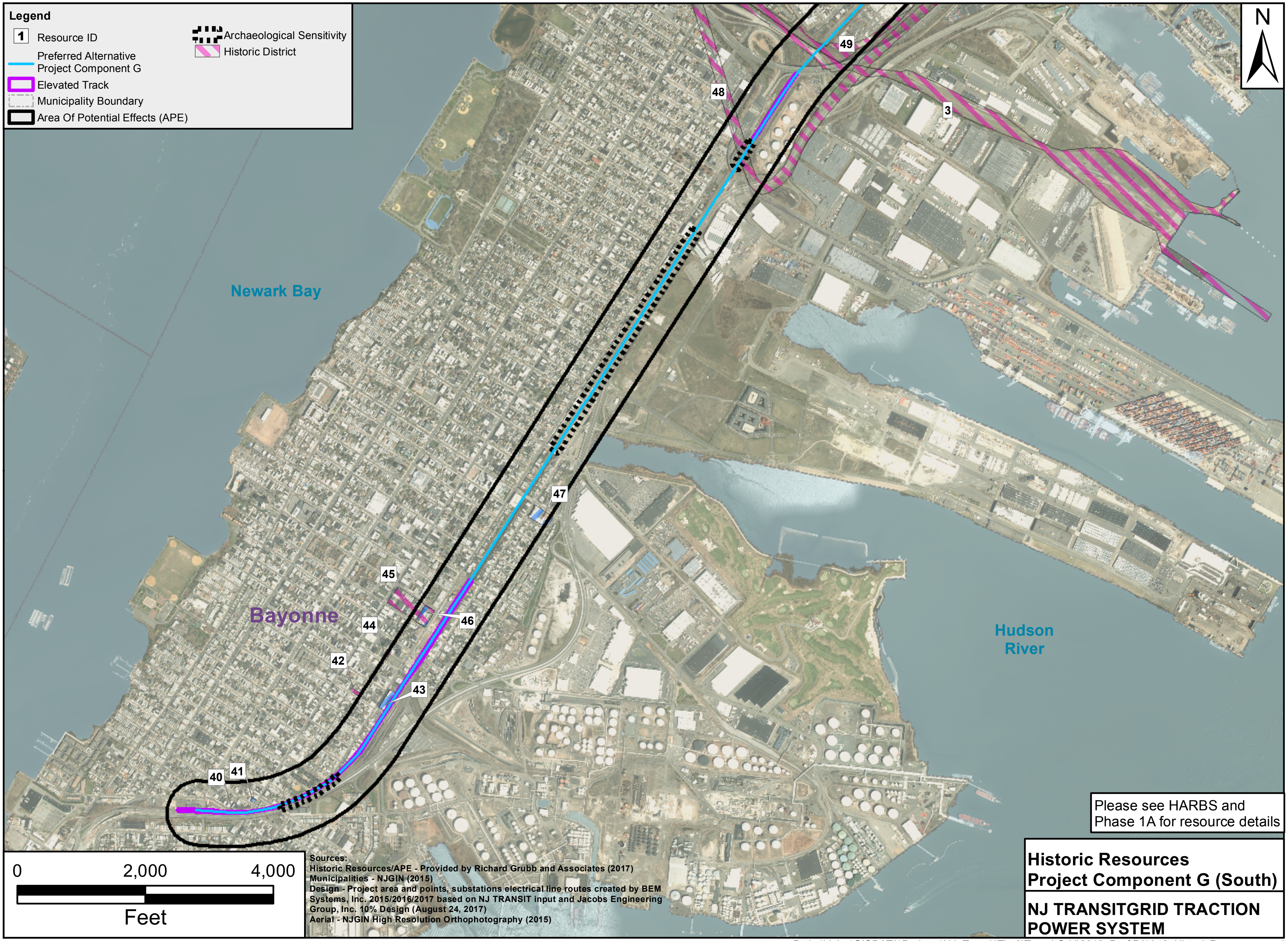

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ATTACHMENT 3

HPO Project# 14-1685-14,-15,-16
HPO-D2018-122 PROD

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NATURAL & HISTORIC RESOURCES
HISTORIC PRESERVATION OFFICE
MAIL CODE 501-04B
P.O. BOX 420
TRENTON, NJ 08625-0420
TEL: # 609-984-0176 FAX: # 609-984-0578

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Acting Commissioner

April 24, 2018

Dara Callender
Manager, Environmental Compliance
NJ TRANSIT
One Penn Plaza East
Newark, NJ 07105

Dear Ms. Callender:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 CFR Part 800: Protection of Historic Properties, as published with amendments in the Federal Register on 6 July 2004 (69 FR 40544-40555), I am providing **Consultation Comments** for the following proposed undertaking:

Hudson County, Town of Kearny, Jersey City, Hoboken, Union City
Bayonne, Weehawken, and North Bergen
NJ TRANSIT TransitGrid
Federal Transit Administration (FTA)

Summary (NEW SHPO OPINIONS):

Based on the survey provided, the following properties have been given a new or revised opinion of eligibility for inclusion in the New Jersey (NJR) and National (NR) Registers of Historic Places:

- Ruth Court / Maryland Court / Plaza Court, 3139-3149 John F. Kennedy Boulevard, City of Jersey City, is eligible for inclusion in the NJR and NR under Criterion C as it embodies "distinctive characteristics of a type, period, or method of construction."
- Belvedere Court, 364-270 Palisade Avenue, City of Jersey City, is eligible for inclusion in the NJR and NR under Criteria A and C as a well-preserved example of an early luxury apartment building designed by the prominent local architectural firm of William Neumann.
- Substation 41, Amtrak Northeast Corridor, Town of Kearny, is a contributing feature of the Pennsylvania Railroad (PRR) New York to Philadelphia Historic District.
- L.O. Koven & Bro. Inc. Sheet Iron and Plate Steel Works, 100 Paterson Plank Road, City of Jersey City, is no longer eligible for inclusion in the NJR and NR due to extensive alterations.
- The following resources have been demolished and are therefore no longer eligible for inclusion in the NJR and NR:
  - Covert/Larch Historic District, City of Jersey City
  - Central Railroad of New Jersey Passenger Depot, City of Bayonne
  - Gates Avenue Bridge, City of Bayonne
  - Roundhouse, Central Railroad of New Jersey, City of Jersey City

- Central Railroad Bridge, City of Jersey City
- Conrail Bridge, City of Jersey City
- Schiavone-Bonomo Corporation, City of Jersey City
- Engine Company Number 8 Firehouse, City of Jersey City
- Firehouse Number 12, City of Jersey City
- Rogers-Pyatt Shellac Company/S.A. Wald Marine Cargo Salvors Warehouse, City of Jersey City
- PATH Exchange Place Station Entrance, City of Jersey City
- Erie Terminal Station of the Hudson and Manhattan Railroad Company ("Erie Station/Path Pavonia Station"), City of Jersey City
- 14th Street Viaduct, multiple municipalities
- Doric Temple, City of Union City

The consultation comments below are in reply to the following cultural resources reports received at the New Jersey Historic Preservation Office (HPO):

Davis, Allee and Lynn Alpert
June 16, 2017 — *Historic Architectural Resources Background Survey (HARBS) and Effects Assessment (EA) Report, NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey,* Volumes I and II. Prepared for BEM Systems, Inc., Chatham, NJ. Prepared by Richard Grubb and Associates, Cranbury, New Jersey.

DeWhite, Sharon and Teresa Bulger
June 16, 2017 — *Phase IA Archaeological Survey, NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey.* Prepared for BEM Systems, Inc., Chatham, NJ. Prepared by Richard Grubb and Associates, Cranbury, New Jersey.

Alpert, Lynn
June 16, 2017 — Letter report from, Lynn Alpert, Architectural Historian, Richard Grubb and Associates, to Dr. Katherine Marcopul, Deputy State Historic Preservation Officer, New Jersey Historic Preservation Office, concerning "Historic Context and Integrity Analysis, Pennsylvania Railroad Substations in New Jersey."

Bulger, Teresa D. and Sharon D. White
December 2017 — *Supplemental Information for the Phase IA Archaeological Survey (Phase IA), NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey.*

Davis, Allee and Lynn Alpert
December 20, 2017 *Supplemental Information for the Historic Architectural Resources Background Survey (HARBS) and Effects Assessment (EA) Report, NJ TransitGrid Traction Power System, City of Bayonne, Town of Kearny, City of Jersey City, City of Hoboken, Township of Weehawken, City of Union City, and Township of North Bergen, Hudson County, New Jersey,* Volumes I and II. Prepared for BEM Systems, Inc., Chatham, NJ. Prepared by Richard Grubb and Associates, Cranbury, New Jersey.

800.4 Identification of Historic Properties

Historic Architecture

The submitted architectural survey examined 93 historic resources that were previously identified as listed in the NJR and/or NR, received a formal Determination of Eligibility (DOE) from the Keeper of the National Register, certified as National Register-eligible (COE) by the SHPO, or evaluated as National Register-eligible (SHPO Opinion) by the SHPO. Of these previously identified resources, the current survey determined that 14 of them have been demolished and 1 has suffered from a loss of integrity due to inappropriate alterations. In addition, 63 resources more than 50 years of age were evaluated for their potential significance. As a result of the intensive level survey, the following historic resources were identified within the Area of Potential Effects (APE) for Project Components A-G:

Listed in the NJR and/or NR:

- US Route 1 Extension [Pulaski Skyway] Historic District, multiple municipalities (NJR 6/13/2005; NR 8/12/2005)
- Jersey City High School [William Dickinson High School], City of Jersey City (NJR 12/23/1981; NR 6/1/1982)
- Engine Company #3, Truck #2 Firehouse, City of Jersey City (NJR 2/9/1984; NR 3/30/1984)
- Erie-Lackawanna Terminal, City of Hoboken (NJR 12/7/2004; NR 2/17/2005)
- Bayonne Trust Company, City of Bayonne (SHPO Opinion 12/9/1994; COE: 1/30/2002; NJR 4/20/2006; NR 8/8/2006)
- Morris Canal, multiple municipalities (SHPO Opinion: 5/27/2004; NJR 11/26/1973; NR 10/1/1974)
- Paulus Hook Historic District, City of Jersey City (NJR 8/7/1981; NR 6/21/1982)
- Van Vorst Park Historic District, City of Jersey City (NJR 8/21/1984; NR 10/11/1984)
- Hudson and Manhattan Railroad Powerhouse, City of Jersey City (COE 10/7/1999; NR 11/23/2001)
- Great Atlantic and Pacific Tea Company Warehouse, City of Jersey City (NJR 6/2/1978; NR 6/2/1978; NHL 6/2/1978)
- Butler Brothers Warehouse, City of Jersey City (SHPO Opinion 9/5/2013; NJR 10/26/2015)
- Holland Tunnel, City of Jersey City (NJR 10/13/1995; NHL 11/3/1993; NR 11/4/1993)
- Pohlmann's Hall, City of Jersey City, (NJR 7/5/1985; NR 9/5/1985)

Previously evaluated as eligible for inclusion in the NJR and/or NR:

- Old Main Delaware, Lackawanna and Western (DL&W) Railroad Historic District, multiple municipalities (SHPO Opinion 9/24/1996)

- PRR New York to Philadelphia Historic District, multiple municipalities (SHPO Opinion 10/2/2002)
- PRR New York Bay Branch Historic District, City of Newark (SHPO Opinion 4/22/2005)
- Essex Generating Station, Town of Kearny and City of Newark (SHPO Opinion 3/23/2015)
- Public Service Electric and Gas Company (PSE&G), Kearny-Essex-Marion Interconnection Historic District, Town of Kearny and City of Jersey City (SHPO Opinion 12/31/2013)
- Jersey City Water Works Historic District, multiple municipalities (SHPO Opinion 1/20/2003)
- Hackensack River Lift Bridges Historic District, Town of Kearny and City of Jersey City (SHPO Opinion 5/3/2002)
- People's Gas Light Company/PSE&G Marion Office Historic District, City of Jersey City (SHPO Opinion 3/10/1999)
- DL&W Railroad Boonton Line Historic District, multiple municipalities (SHPO Opinion 9/18/2008)
- US Routes 1 & 9 Historic District, multiple municipalities (SHPO Opinion 3/8/1996)
- New Jersey Midland Railway/New York, Susquehanna and Western Railroad Historic District, multiple municipalities (SHPO Opinion 4/25/2006 and 1/30/2015)
- Erie Railroad Main Line Historic District, multiple municipalities (SHPO Opinion 2/20/2003)
- Erie Railroad Bergen Archways Historic District, City of Jersey City (SHPO Opinion 4/27/2000)
- Hudson and Manhattan Railroad Transit System (PATH) Historic District, multiple municipalities (SHPO Opinion 3/4/2002)
- Hoboken Historic District, City of Hoboken (SHPO Opinion 12/12/2016)
- Substation 4, Town of Kearny (SHPO Opinion 9/12/1994)
- Edison Battery Company Property, Town of Kearny (SHPO Opinion 4/8/2008)
- Jersey City Water Works Pipeline, City of Jersey City (SHPO Opinion 5/7/1999)
- PSE&G Kearny Generating Station, Town of Kearny (SHPO Opinion 5/3/2002)
- Lower Hack Draw Bridge, Town of Kearny and City of Jersey City (SHPO Opinion 9/18/1996)
- Wittpenn Bridge [SI&A #0909150], Town of Kearny and City of Jersey City (SHPO Opinion 2/7/2001)
- PRR Harsimus Branch (Conrail/CSX) Bridge over the Hackensack River, Town of Kearny and City of Jersey City (SHPO Opinion 5/3/2002)
- PRR (PATH) Bridge over Hackensack River, Town of Kearny and City of Jersey City (SHPO Opinion 5/3/2002)
- St. Peter's Cemetery, City of Jersey City (SHPO Opinion 6/18/1996)
- West End Interlocking Tower, City of Jersey City (SHPO Opinion 1/20/1999)
- West-End Through Truss Bridges, City of Jersey City (SHPO Opinion 3/31/1997)
- Old and New Bergen Tunnels, City of Jersey City (SHPO Opinion 5/8/1998)
- JFK Boulevard Bridge [SI&A # 0951170], City of Jersey City (SHPO Opinion 4/27/2000)
- Erie Railroad Bergen Hill Tunnel [aka Long Dock Tunnel], City of Jersey City (SHPO Opinion 4/27/2000)
- Palisade Avenue Bridge [SI&A # 0951165], City of Jersey City (SHPO Opinion 4/27/2000)

- Holbrook Manufacturing Company, City of Jersey City (SHPO Opinion 2/28/1991)
- Continental Can Company Complex, City of Jersey City (SHPO Opinion 5/30/1997)
- Lackawanna Warehouse and Viaduct, City of Jersey City (SHPO Opinion 5/16/1995)
- Grove Street Bridge, City of Jersey City (SHPO Opinion 1/20/1999)
- Mechanic's Trust Company, City of Bayonne (SHPO Opinion 12/9/1994)
- East 17th Street Apartment Buildings Streetscape, City of Bayonne (SHPO Opinion 12/9/1994)
- Maidenform Brassiere Company, City of Bayonne (SHPO Opinion 12/9/1994)
- East 19th Street Streetscape, City of Bayonne (SHPO Opinion 12/9/1994)
- Mount Carmel Historic District, City of Bayonne (SHPO Opinion 2/28/1991)
- YMCA of Bayonne, City of Bayonne (SHPO Opinion 5/5/1997)
- Public School Number 5, City of Bayonne (SHPO Opinion 2/28/1991)
- Lehigh Valley Railroad Historic District, multiple municipalities (SHPO Opinion 3/15/2002)
- PRR New York Bay Branch Historic District, multiple municipalities (SHPO Opinion 9/10/2014)
- Hanover National Bank Repository, City of Jersey City (COE 5/18/2006)
- Communipaw-Lafayette Historic District, City of Jersey City (SHPO Opinion 2/17/1995)
- Ocean Avenue Bridge (SI&A #0950163), City of Jersey City (SHPO Opinion 5/16/1995)
- Bergen Avenue Bridge (SI&A #0900011), City of Jersey City (SHPO Opinion 5/16/1995)
- Former Candy Factory, City of Jersey City (SHPO Opinion 2/28/1991)
- One Exchange Place (Bank Building), City of Jersey City (SHPO Opinion 2/28/1991)
- Commercial Trust Company Bank, City of Jersey City (SHPO Opinion 5/16/1995)
- Warehouse Historic District, City of Jersey City (SHPO Opinion 2/28/1991)
- L.O. Koven & Brothers Sheet Iron and Plate Steel Works, City of Jersey City (SHPO Opinion 2/28/1991)
- 269-271 Ogden Avenue, City of Jersey City (SHPO Opinion 2/28/1991)
- 268-272 Ogden Avenue, City of Jersey City (SHPO Opinion 2/28/1991)
- Ferguson Brothers Manufacturing Company, City of Hoboken (SHPO Opinion 10/16/1998)
- Old Hillside Road Trolley Horseshoe Curve, multiple municipalities (SHPO Opinion 5/21/1999)
- North (Hudson) River Tunnels, multiple municipalities (SHPO Opinion 11/12/1998)
- NJ Route 3 (NJ 495) Highway Approach to Lincoln Tunnel Historic District, Weehawken Township (SHPO Opinion 11/17/1999)
- NJ Route 495 Viaduct (SI&A 3800031), Weehawken Township (SHPO Opinion 5/16/1995)
- Lincoln Tunnel Entrance and Ventilation Buildings, Weehawken Township (SHPO Opinion 2/28/1991)
- Lincoln Tunnel, Weehawken Township (SHPO Opinion 2/25/2003)
- King's Bluff Historic District, Weehawken Township (SHPO Opinion 5/16/1995)
- West Shore Railroad Tunnel, multiple municipalities (SHPO Opinion 2/28/1991)
- R. Neumann & Co. Factory Complex/300 Observer Highway, City of Hoboken (SHPO Opinion 12/9/2016)

Previously evaluated as eligible for inclusion in the NJR and/or NR, but no longer extant:

- Covert/Larch Historic District, City of Jersey City (SHPO Opinion 3/10/1999)
- Central Railroad of New Jersey Passenger Depot, City of Bayonne (SHPO Opinion 9/11/1975)
- Gates Avenue Bridge (SI&A# 82003274), City of Bayonne (SHPO Opinion 12/9/1994)

- Roundhouse for the Central Railroad of New Jersey, City of Jersey City (SHPO Opinion 10/1/1975)
- Central Railroad Bridge, City of Jersey City (SHPO Opinion 2/28/1991)
- Conrail Bridge, City of Jersey City (SHPO Opinion 5/16/1995)
- Schiavone-Bonomo Corporation, City of Jersey City (SHPO Opinion 5/16/1995)
- Engine Company Number 8 Firehouse, City of Jersey City (SHPO Opinion 6/12/1980)
- Firehouse Number 12, City of Jersey City (SHPO Opinion 5/16/1995)
- Rogers-Pyatt Shellac Company/S.A. Wald Marine Cargo Salvors Warehouse, City of Jersey City (SHPO Opinion 2/17/1995)
- PATH Exchange Place Station Entrance, City of Jersey City (SHPO Opinion 2/28/1991)
- Erie Terminal Station of the Hudson and Manhattan Railroad Company ("Erie Station/Path Pavonia Station"), City of Jersey City (SHPO Opinion 11/23/1983; DOE 6/26/1984)
- 14th Street Viaduct, multiple municipalities (SHPO Opinion 10/16/1998)
- Doric Temple, City of Union City (SHPO Opinion 10/18/1995)

It is my opinion as New Jersey Deputy State Historic Preservation Officer that the following resource, previously evaluated as eligible for inclusion in the NJR and NR, no longer meets the NJR/NR eligibility criteria, and is therefore not eligible for inclusion in the NJR/NR:

- L.O. Koven & Bro. Inc. Sheet Iron and Plate Steel Works (RGA-E1), 100 Paterson Plank Road, City of Jersey City. On February 28, 1991, the New Jersey SHPO evaluated this property as eligible for inclusion in the NJR/NR under Criterion C for its significance in the area of architecture as an excellent example of the industrial vernacular style and as part of an integrated and well-preserved group of industrial buildings. As indicated in the June 16, 2017 *Historic Architectural Resources Background Survey (HARBS) and Effects Assessment (EA) Report,* the property was extensively renovated in 2007, with some architecturally incompatible additions and a loss of historic fabric. Based on the extent and nature of the renovations, the property does not retain sufficient architectural integrity to meet NJR and NR Criterion C.

It is my opinion as New Jersey Deputy State Historic Preservation Officer that there is insufficient information at this time to issue an opinion of the eligibility for inclusion in the NJR/NR for the following resource that was identified in the June 16, 2017 *Historic Architectural Resources Background Survey (HARBS) and Effects Assessment (EA) Report* as eligible for inclusion in the NJR/NR:

- Bayonne Garden Apartments Historic District (RGA-52), 15-18 12th Street, City of Bayonne. The apartment complex is a simple, rather unadorned example of early twentieth garden apartment buildings. The architect, Andrew J. Thomas, does not appear to meet the test for "work of a master."

Based on the cultural resources report, it is my opinion as New Jersey Deputy State Historic Preservation Officer that the following resources are eligible for inclusion in the NJR/NR:

- **Ruth Court / Maryland Court / Plaza Court (RGA-18)**, 3139-3149 John F. Kennedy Boulevard, City of Jersey City. Built ca. 1920, this Tudor Revival-style apartment building meets NR Criterion C as it embodies "distinctive characteristics of a type, period, or method of construction." Located in the "Heights" neighborhood of Jersey City, this four-story multi-bay apartment house was a prevalent early twentieth century building type in urban areas. In addition, the building's detailing reflects the prevalent Tudor Revival style.

- **Belvedere Court (RGA-25)**; 364-270 Palisade Avenue, Jersey City. Built in 1914, this Spanish Colonial Revival apartment house is significant as a well-preserved example of an early luxury apartment building in the Heights section of Jersey City. Designed by the prominent local architectural firm of William Neumann, the apartment house reflects the transition to high-rise modern apartment buildings in burgeoning residential neighborhoods. It is eligible for inclusion in the NJR / NR under eligibility Criteria A and C.
- **Substation 41**, Amtrak Northeast Corridor, City of Kearny. Constructed in the 1930s as part of the PRR's electrification of its main line between New York and Philadelphia, this resource is a contributing feature to the NR-eligible PRR New York to Philadelphia Historic District. As part of the current project, the substation was evaluated for the extent to which the Northeast Corridor's 1930s substations retain five aspects of their historic fabric: setting, function, superstructure, control house, and original equipment. Substation 41 retains all or part of its setting, function, and superstructure (although with some new components) and has what appears to be four original transformers (two American Brown Bouveri Company service transformers and two General Electric type E-116 instrument potential transformers).

These are **new SHPO Opinions of Eligibility.**

Archaeology

Thank you for providing the HPO with the opportunity to review and comment on the potential for the above-referenced undertaking to affect historic properties.

The additional information contained within the December 2017 supplemental report includes appropriate archaeological recommendations within the APE organized by project component and additional information regarding the archaeological sensitivity of each project component. The proposed project consists of the installation of monopoles of varying heights with associated duck banks throughout the APE. The installation of monopoles and utilities/duck banks will be undertaken using different construction techniques. In the case of the monopoles, ground disturbance will involve the use of a truck-mounted drill where an auger is drilled into the ground, turning up soils from subsurface deposits. For the installation of the utilities and duck banks, ground disturbance would include the mechanical excavation of trenches to a maximum depth of five feet. The report recommends archaeological monitoring for the installation of the monopoles and utilities/duck banks in areas of archaeological sensitivity within the APE.

The HPO concurs with a portion of the above assessment. Recent projects of a similar nature reviewed by the HPO have found that archaeological monitoring of mechanically excavated monopoles is not effective in recovering useful archaeological data. Therefore, the HPO only recommends archaeological monitoring for the installation of utilities and duct banks within areas of archaeological sensitivity as identified in this report. In addition, the New Jersey Junction Railroad-to-Newark Avenue Iron Viaduct (Substructure Only) is located within Project Component F, Section 1 and is eligible for inclusion in the NJR and NR. If utility and/or duct banks are proposed within this eligible resource, archaeological monitoring will be required.

800.5 Assessing Adverse Effects

The assessment of the proposed project's potential effects is based on review of the following design documents:

- NJ Transitgrid Morris & Essex Line Distribution, 10% submittal plans, 8/24/17

- NJ Transitgrid Morris & Essex Transmission, 20% submittal plans, 2/27/18
- NJ TRANSIT Microgrid – Distribution-HBLR South, 10% submittal plans, 8/24/17
- NJ TRANSIT Microgrid – Distribution-HBLR North, 10% submittal plans, 8/24/17

The various project components (described in the survey report as A-G) were evaluated for their potential effects. Components A-E have the potential to affect the National Register-eligible Old Main DL&W Railroad Historic District as well as resources within the corridor's viewshed. Component F extends south to Caven Point, using either an existing NJ Turnpike right-of-way or the existing Hudson Bergen Light Rail (HBLR) line. Component G extends north along the HBLR. These two project components, especially Component G, come in close proximity to numerous historic resources, and have the potential to visually affect these resources. The potential effects are discussed below under the individual historic resources.

Based on a review of the preliminary project plans, the proposed project, including Components A-G, will not have an effect on the following resources listed in or eligible for inclusion in the NJR/NR:

- Jersey City Water Works Historic District, multiple municipalities (SHPO Opinion 1/20/2003)
- Erie Railroad Bergen Archways Historic District, City of Jersey City (SHPO Opinion 4/27/2000)
- Hudson and Manhattan Railroad Transit System (PATH) Historic District, multiple municipalities (SHPO Opinion 3/4/2002)
- Jersey City Water Works Pipeline, City of Jersey City (SHPO Opinion 5/7/1999)
- Wittpenn Bridge [SI&A #0909150], Town of Kearny and City of Jersey City (SHPO Opinion 2/7/2001)
- PRR Harsimus Branch (Conrail/CSX) Bridge over the Hackensack River, Town of Kearny and City of Jersey City (SHPO Opinion 5/3/2002)
- PRR (PATH) Bridge over Hackensack River, Town of Kearny and City of Jersey City (SHPO Opinion 5/3/2002)
- JFK Boulevard Bridge [SI&A # 0951170], City of Jersey City (SHPO Opinion 4/27/2000)
- Palisade Avenue Bridge [SI&A # 0951165], City of Jersey City (SHPO Opinion 4/27/2000)
- Morris Canal, multiple municipalities (SHPO Opinion: 5/27/2004; NJR 11/26/1973; NR 10/1/1974)
- Hudson and Manhattan Railroad Transit System (PATH) Historic District, multiple municipalities (SHPO Opinion 3/4/2002)
- Holland Tunnel, City of Jersey City (NJR 10/13/1995; NHL 11/3/1993; NR 11/4/1993)
- L.O. Koven & Brothers Sheet Iron and Plate Steel Works, City of Jersey City (SHPO Opinion 2/28/1991)
- North (Hudson) River Tunnels, multiple municipalities (SHPO Opinion 11/12/1998)
- Lincoln Tunnel, Weehawken Township (SHPO Opinion 5/16/1995)
- West Shore Railroad Tunnel, multiple municipalities (SHPO Opinion 2/28/1991)

The proposed project, including Components A-G, will have an effect, but not adverse, on the following resources listed in or eligible for inclusion in the NJR/NR:

- PRR New York to Philadelphia Historic District, multiple municipalities (SHPO Opinion 10/2/2002)

The proposed project is within close proximity to the PRR New York to Philadelphia Historic District; however, the proposed poles will not be placed on this historic district and will only have a minor visual effect.

- Substation 4, Town of Kearny (SHPO Opinion 9/12/1994). This substation, a contributing feature of the PRR New York to Philadelphia Historic District, is located in close proximity to the western end of the project and will be within direct viewshed of Amtrak's new Substation 41. However, the visual effect will not be adverse due to the industrial nature of both substations and the immediately surrounding area. In addition, there will be no direct physical effect on Substation 4.
- Substation 41, Town of Kearny. This substation, a contributing feature of the Old Main DL&W Railroad Historic District, will retain most of its historic elements, including use, setting, and superstructure (with some new superstructure added). Its original control house was lost in a fire; the existing structures to be removed are modern. Although there are two transformers that are believed to be original, the loss of these two pieces of equipment is considered acceptable.
- PRR New York Bay Branch Historic District, City of Newark (SHPO Opinion 4/22/2005)
- Essex Generating Station, Town of Kearny and City of Newark (SHPO Opinion 3/23/2015)
- Public Service Electric and Gas Company (PSE&G), Kearny-Essex-Marion Interconnection Historic District, Town of Kearny and City of Jersey City (SHPO Opinion 12/31/2013)
- People's Gas Light Company/PSE&G Marion Office Historic District, City of Jersey City (SHPO Opinion 3/10/1999)
- US Route 1 Extension [Pulaski Skyway] Historic District, multiple municipalities (NJR 6/13/2005; NR 8/12/2005)
- US Routes 1 & 9 Historic District, multiple municipalities (SHPO Opinion 3/8/1996)
- New Jersey Midland Railway/New York, Susquehanna and Western Railroad Historic District, multiple municipalities (SHPO Opinion 4/25/2006 and 1/30/2015)
- Erie Railroad Main Line Historic District, multiple municipalities (SHPO Opinion 2/20/2003)
- Edison Battery Company Property, Town of Kearny (SHPO Opinion 4/8/2008)
- PSE&G Kearny Generating Station, Town of Kearny (SHPO Opinion 5/3/2002)
- St. Peter's Cemetery, City of Jersey City (SHPO Opinion 6/18/1996)
- Erie Railroad Bergen Hill Tunnel [aka Long Dock Tunnel], City of Jersey City (SHPO Opinion 4/27/2000)
- Jersey City High School [William Dickinson High School], City of Jersey City (NJR 12/23/1981; NR 6/1/1982)
- Holbrook Manufacturing Company, City of Jersey City (SHPO Opinion 2/28/1991)
- Continental Can Company Complex, City of Jersey City (SHPO Opinion 5/30/1997)
- Lackawanna Warehouse and Viaduct, City of Jersey City (SHPO Opinion 5/16/1995)
- Grove Street Bridge, City of Jersey City (SHPO Opinion 1/20/1999)

- Engine Company #3, Truck #2 Firehouse, City of Jersey City (NJR 2/9/1984; NR 3/30/1984)
- Erie-Lackawanna Terminal, City of Hoboken (NJR 12/7/2004; NR: 2/17/2005)
- Hoboken Yard / Henderson Street Substation
- Belvedere Court (RGA-25), 264-270 Palisade Avenue, City of Jersey City
- R. Neumann & Co. Factory Complex/300 Observer Highway, City of Hoboken (SHPO Opinion 12/9/2016)
- Hoboken Historic District, City of Hoboken (SHPO Opinion 12/12/2016)
- Mechanic's Trust Company, City of Bayonne (SHPO Opinion 12/9/1994)
- Bayonne Trust Company, City of Bayonne (SHPO Opinion 12/9/1994; COE: 1/30/2002; NJR 4/20/2006; NR 8/8/2006)
- East 17th Street Apartment Buildings Streetscape, City of Bayonne (SHPO Opinion 12/9/1994)
- Maidenform Brassiere Company, City of Bayonne (SHPO Opinion 12/9/1994)
- East 19th Street Streetscape, City of Bayonne (SHPO Opinion 12/9/1994)
- Mount Carmel Historic District, City of Bayonne (SHPO Opinion 2/28/1991)
- YMCA of Bayonne, City of Bayonne (SHPO Opinion 5/5/1997)
- Public School Number 5, City of Bayonne (SHPO Opinion 2/28/1991)
- Lehigh Valley Railroad Historic District, multiple municipalities (SHPO Opinion 3/15/2002)
- PRR New York Bay Branch Historic District, multiple municipalities (SHPO Opinion 9/10/2014)
- Hanover National Bank Repository, City of Jersey City (COE 5/18/2006)
- Communipaw-Lafayette Historic District, City of Jersey City (SHPO Opinion 2/17/1995)
- Ocean Avenue Bridge (SI&A #0950163), City of Jersey City (SHPO Opinion 5/16/1995)
- Bergen Avenue Bridge (SI&A #0900011), City of Jersey City (SHPO Opinion 5/16/1995)
- Former Candy Factory, City of Jersey City (SHPO Opinion 2/28/1991)
- Paulus Hook Historic District, City of Jersey City (NJR 8/7/1981; NR 6/21/1982)
- Van Vorst Park Historic District, City of Jersey City (NJR 8/21/1984; NR 10/11/1984)
- One Exchange Place (Bank Building), City of Jersey City (SHPO Opinion 2/28/1991)
- Commercial Trust Company Bank, City of Jersey City (SHPO Opinion 5/16/1995)
- Hudson and Manhattan Railroad Powerhouse, City of Jersey City (COE 10/7/1999; NR 11/23/2001)
- Warehouse Historic District, City of Jersey City (SHPO Opinion 2/28/1991)
- Great Atlantic and Pacific Tea Company Warehouse, City of Jersey City (NJR 6/2/1978; NR 6/2/1978; NHL 6/2/1978)
- Butler Brothers Warehouse, City of Jersey City (SHPO Opinion 9/5/2013; NJR 10/26/2015)
- Pohlmann's Hall, City of Jersey City, (NJR 7/5/1985; NR 9/5/1985)
- 269-271 Ogden Avenue, City of Jersey City (SHPO Opinion 2/28/1991)
- 268-272 Ogden Avenue, City of Jersey City (SHPO Opinion 2/28/1991)
- Ferguson Brothers Manufacturing Company, City of Hoboken (SHPO Opinion 10/16/1998)

- Old Hillside Road Trolley Horseshoe Curve, multiple municipalities (SHPO Opinion 5/21/1999)
- NJ Route 3 (NJ 495) Highway Approach to Lincoln Tunnel Historic District, Weehawken Township (SHPO Opinion 11/17/1999)
- NJ Route 495 Viaduct (SI&A 3800031), Weehawken Township (SHPO Opinion 5/16/1995)
- Lincoln Tunnel Entrance and Ventilation Buildings, Weehawken Township (SHPO Opinion: 2/28/1991)
- King's Bluff Historic District, Weehawken Township (SHPO Opinion 5/16/1995)

Project Components F and G's use of the HBLR line will involve the installation of new utility poles that will be similar to the HBLR's existing poles in design and color, although taller. The existing poles are approximately 25' in height; the proposed poles will be approximately 39' in height. Based on a review of the analysis in the June 16, 2017 *Historic Architectural Resources Background Survey (HARBS) and Effects Assessment (EA) Report,* it is my opinion as Deputy State Historic Preservation Officer that the proposed Components F and G will not constitute an adverse effect on resources listed in or eligible for inclusion in the NJR and NR.

The proposed project, specifically Project Components D and E, will have an **adverse effect** on the following resources listed in or eligible for inclusion in the NJR/NR:

- Old Main DL&W Railroad Historic District, multiple municipalities (SHPO Opinion 9/24/1996)
  - Rail corridor from Hoboken to Kearny. The rail corridor will be directly affected through the construction of approximately 60 new monopoles and 8 new portals. The effect on the rail corridor has been analyzed in three segments:
    - East of the Bergen Tunnels. The effect will be minimal due to the fact that there will be only be five new poles between the tunnels' eastern portals and the new proposed Hoboken East Substation. Between the substation and the Hoboken Yard, the line will run on the existing HBLR; within the Hoboken Yard the power will utilize poles being constructed as part of a separate project.
    - Portion of the rail corridor between the Bergen Tunnels' western portals and the Hackensack River. This portion of the rail line has maintained a high level of integrity, both in terms of the line itself and its setting. The 24 new poles, although only proposed to be a maximum of 65' tall, will be significantly taller than the rail corridor's existing catenaries and signal bridges and will have a cumulative adverse effect on the rail corridor as well as the following resources in the portion of the corridor immediately west of the Bergen Tunnels: Bergen Tunnels' western portal, the West End Through Truss Bridges, the West End Interlocking Tower, and the DL&W Railroad Boonton Line Historic District. In addition, the proposed 175' monopole immediately east of the Lower Hack Draw Bridge will have an adverse effect on the rail corridor. The adverse effect is based on a cumulative visual effect.

      The physical alterations to the West End Truss Bridges and the Bergen Tunnels, two resources that contribute to the Old Main DL&W Railroad Historic District, have been planned to be in accordance with the *Secretary* *of the Interior's Standards for Rehabilitation ("Standards")*. Therefore, the project's direct physical effect on these contributing resources will not be adverse.

- Portion of the rail corridor between the Hackensack River and the western end of the project at Substation 41. This portion of the rail line has maintained a high level of integrity within the corridor right-of-way, although its setting has been compromised due to the construction of multiple surrounding poles ranging in height from 105' to 300'. The 29 new poles, proposed to be a maximum of 175' tall, will be substantially taller than the rail corridor's existing catenaries and signal bridges and will have a cumulative adverse effect on the rail corridor. In addition, the proposed 175' monopole immediately west of the Lower Hack Draw Bridge will have an adverse effect on the rail corridor.

- Lower Hack Draw Bridge, Town of Kearny and City of Jersey City (SHPO Opinion 9/18/1996), and the Hackensack River Lift Bridges Historic District, Town of Kearny and City of Jersey City (SHPO Opinion 5/3/2002). In order for the line to cross the Hackensack River, the project includes construction of two 175' monopoles in close proximity to the bridge, one on the east river bank and one on the west river bank. The Lower Hack Draw Bridge, which is individually eligible for inclusion in the National Register of Historic Places and is a contributing element of the Old Main DL&W Railroad Historic District as well as the Hackensack River Lift Bridges Historic District, will be adversely affected due to the height of the monopoles in close proximity to the bridge.

800.6 Resolution of Adverse Effects

In accordance with 36 CFR 800.6, the HPO appreciates NJ TRANSIT's consideration of steps to avoid or minimize adverse effects to the Old Main DL&W Railroad Historic District and some of its contributing features, including the possible use of the southern route around NJ TRANSIT's Meadowlands Maintenance Complex, thereby reducing the visual effect to the rail corridor. According to our review of the current plans, running all poles along the rail corridor would require construction of 17 poles and 8 portals on rail line; using the combined route with some of the poles on the southern route would reduce the number to 12 poles and 8 portals on the rail line; and using the southern route would further reduce the number to 8 poles and 1 portal on the rail line.

We look forward to continuing to consult with you to review other possible steps to avoid, minimize, or mitigate the adverse visual effects to the Old Main DL&W Railroad Historic District, the Bergen Tunnels' western portal, the West End Through Truss Bridges, the West End Interlocking Tower, the Lower Hack Draw Bridge, the Hackensack River Lift Bridges Historic District, and the DL&W Railroad Boonton Line Historic District, and to including these provisions within a Memorandum of Agreement (MOA). When developed, the MOA should include, at a minimum, mitigation measures, provisions for the HPO to review and approve project plans as they are further developed, and the requirement for archaeological monitoring in accordance with an archaeological monitoring work plan that is submitted to the HPO for review and comment.

Additional Comments

Thank you again for providing the opportunity to review and comment on this project. The HPO looks forward to receiving a draft MOA for review and comment, as well as an *Application for Project Authorization Under the New Jersey Register of Historic Places Act* (N.J.S.A. 13:1B-15.128 et seq.) pertaining to any properties listed in the New Jersey Register of Historic Places. Please reference the HPO project number 14-1685 in any future calls, emails, submissions, or written correspondence to help expedite your review and response. If you have any questions, please feel free to contact Meghan Baratta at (609) 292-1253 or Vincent Maresca of my staff at (609) 633-2395.

Sincerely,

Katherine J. Marcopul

Katherine J. Marcopul
Deputy State Historic
Preservation Officer

KJM/MMB/VM/NLZ

C:

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