

Draft
Environmental Assessment
Middlesex County Utilities Authority
Restoration, Upgrade, and Flood Hazard Mitigation of the Edison Pump
Station
Edison Township, Middlesex County, New Jersey

FEMA-4086-DR-NJ

PW-5075

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26 Federal Plaza, NY, NY 10278

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PURPOSE AND NEED..... 2

3.0 BACKGROUND 3

4.0 ALTERNATIVES..... 5

 4.1 No Action Alternative 5

 4.2 Proposed Action Alternative – Restoration and Upgrade 5

 4.3 Alternatives Considered and Dismissed..... 6

 4.3.1 WCF Wet Flood-Proofing..... 7

 4.3.2 WCF Flood Wall with Isolation Vault & Bypass Pumping..... 7

 4.3.3 WCF Relocation..... 7

 4.3.4 NWASt Wet Flood-Proofing 8

 4.3.5 NWASt Elevation of Top Slab 8

 4.3.6 NWASt Flood Wall 8

 4.3.7 NWASt Relocation 8

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS 9

 5.1 Physical Resources 9

 5.1.1 Geology and Soils 9

 5.1.2 Site Contamination and Solid & Hazardous Waste Considerations 10

 5.1.3 Air Quality 11

 5.2 Water Resources 13

 5.2.1 Water Quality 13

 5.2.2 Wetlands 15

 5.2.3 Floodplains 16

 5.2.4 Coastal Resources 17

 5.3 Biological Resources 18

 5.3.1 Vegetation 18

 5.3.2 Agricultural Lands 19

 5.3.3 Threatened and Endangered Species and Critical Habitat 19

 5.3.4 Wildlife and Fisheries 20

 5.4 Cultural Resources 21

 5.4.1 Historic Properties 21

 5.4.2 Archaeological Resources 22

 5.5 Aesthetic Resources 22

 5.6 Socioeconomic Resources 23

 5.6.1 Socioeconomics 23

 5.6.2 Environmental Justice 24

 5.6.3 Noise 24

 5.6.4 Traffic 24

 5.6.5 Public Service and Utilities 25

5.6.6	Public Health and Safety.....	25
5.7	Climate Change	26
5.8	Cumulative Impacts.....	27
6.0	PERMITS AND PROJECT CONDITIONS.....	28
6.1	Permits.....	28
6.2	Project Conditions	28
7.0	PUBLIC INVOLVEMENT	30
8.0	CONCLUSION.....	31
9.0	LIST OF PREPARERS.....	32
10.0	REFERENCES	33

APPENDICES

Appendix A	USGS Project Site Location Plan
Appendix B	MCUAEPS Service Area Map
Appendix C	Identification of Existing Facilities
Appendix D	Wetlands Delineation Plan for Project Site
Appendix E	Proposed Action Concept Plan
Appendix F	Natural Heritage Response Letter
Appendix G	HMM / NJDEP OHP Letters Regarding Historic and Archaeological Resources
Appendix H	NJDEP Letter Regarding Abandonment & Isolation of MCUAEPS
Appendix I	USEPA National Ambient Air Quality Standard
Appendix J	Geotechnical Evaluation and Foundation Study
Appendix K	Calculation of Water Volume Displaced by Flood Wall
Appendix L	HMM Basis of Design Memorandum
Appendix M	Agency Coordination and Permits
Appendix N	HMM Report upon MCUA Edison Flood Wall Wave Loads
Appendix O	Letter of FEMA Concurrence with NJDEP Historic Effect Determination
Appendix P	8-Step Floodplain Decision Making Notice

LIST OF ACRONYMS

BFE	Base Flood Elevation
BMP	Best Management Practices
CAFRA	Coastal Area Facility Review Act
CBRA	Coastal Barrier Resources Act
CTP	Central Treatment Plant
DHS	Department of Homeland Security
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HMGP	Hazard Mitigation Grant Program
hp	Horse Power
MCUA	Middlesex County Utilities Authority
MCUACTP	Middlesex County Utilities Authority's Central Wastewater Treatment Plant
MCUAEPS	Middlesex County Utilities Authority's Edison Wastewater Pumping Station
NEPA	National Environmental Policy Act
NHP	New Jersey Natural Heritage Program
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NRCS	Natural Resources Conservation Service
NWAST	MCUAEPS Northwest Access Shaft & Tunnel
OFM	Open File Map
OHP	NJDEP Office of Historic Preservation
OLGCS	Olympic Landfill Gas Compressor Station
OPA	Otherwise Protected Areas
SCD	Soil Conservation District
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WCF	MCUAEPS Wastewater Conveyance Facility

1.0 INTRODUCTION

The Middlesex County Utilities Authority MCUA (Subgrantee) owns and operates the Edison Pump Station (MCUAEPS), which is a regional raw sewage pumping facility that encompasses approximately 1.2 acres and located at the intersection of Sweetwater Lane and Cattail Way, Woodbridge, New Jersey (Block 114, Lot 100.2 on Woodbridge Township Tax Map). It pumps approximately 85-million gallons per day (MGD) of average daily dry weather sanitary flow from Carteret, Perth Amboy, Edison, and Woodbridge.

President Barack H. Obama declared Hurricane Sandy a major disaster on October 30, 2012. The declaration authorized federal public assistance to affected communities and certain nonprofit organizations per Federal Emergency Management Agency (FEMA) 4086-DR-NJ and in accordance with the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974 (42 U.S.C. 5172), as amended; the Sandy Recovery Improvement Act (SRIA) of 2013; and the accompanying Disaster Relief Appropriations Act, 2013. The Subgrantee, through the New Jersey Office of Emergency Management (Grantee), has requested public assistance funding from the Department of Homeland Security, FEMA for the proposed project. The project worksheet is 4086-DR-NJ-PW-5075.

This Hazard Mitigation Proposal (HMP) under Section 406 funding, addresses pump station improvements and the construction of a floodwall for MCUAEPS as described in the following sections. This project is intended to maintain continuous operation of the MCUAEPS as required by regulations, thereby greatly reducing the potential for untreated sewage discharges from the MCUAEPS as a result of equipment failures, power outages, and flooding.

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations Parts 1500-1508), and FEMA's regulations implementing NEPA (44 CFR Part 10). The purpose of this draft EA is to analyze the potential environmental impacts of Flood Mitigation and Permanent Restoration of the MCUAEPS. Measures must be taken to avoid, minimize, and/or mitigate adverse impacts from any proposed actions. FEMA will use the findings in this draft EA to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI).

2.0 PURPOSE AND NEED

The objective of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. Through the Public Assistance Grant Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Nonprofit (NP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

The MCUAEPS, owned and operated by the Middlesex County Utilities Authority, conveys the wastewater of approximately 145,000 residents within its service area through either one of two 60-inch diameter force mains that pass through a 15-foot diameter, 4,000-foot tunnel beneath the Raritan River and to the MCUA Central Wastewater Treatment Plant for primary and secondary treatment. Under the existing conditions, the equipment critical to the operation of the MCUAEPS conveyance of wastewater is susceptible to failure whenever the flood stage exceeds the station's finished floor elevation of 10.06-feet¹. Prior to Hurricane Sandy, the pump station building's (herein referred to as the Wastewater Conveyance Facility (WCF)) finished floor elevation exceeded the (100-year) Base Flood Elevation (BFE) by 1-foot and therefore implied that potential damages to critical equipment would only occur, on average, once in a 100-year period. However, revisions to FEMA flood mapping subsequent to Hurricane Sandy now indicate that the station is much more susceptible to flooding damage than previously recognized.

Pursuant to the current FEMA Preliminary Flood Insurance Rate Map (FIRM), Map Number 34023C0152G, dated January 31, 2014, released subsequent to Hurricane Sandy, the (100-year) BFE of 15-feet now exceeds the finished floor elevation by nearly 5-feet. Even in the absence of anticipated sea level rise, this revised BFE indicates that the WCF is now susceptible to repeated flooding damage for flood events with a recurrence interval of 21-years or greater. Including sea rise, damages equal in magnitude to the Hurricane Sandy disaster event – approximately \$5 million of capital damages, 9-days of complete loss of wastewater service, and an estimated 156-million-gallon spill of raw sewage into the Raritan River and surrounding surface water –now correspond to an estimated 75-year flood event. It is therefore essential that the proposed flood hazard mitigation measures be implemented in order to mitigate this threat to the public health & safety and endangers the sensitive coastal areas located downstream of MCUAEPS.

¹ All elevations within this document are reported with respect to the NAVD88 datum.

3.0 BACKGROUND

The Middlesex County Utilities Authority (MCUA) owns and operates the Edison Pump Station (MCUAEPS), located in Woodbridge, NJ². MCUAEPS was originally constructed in 1966 and serves communities north of the Raritan River including the City of Perth Amboy the Borough of Carteret, and portions of the Townships of Woodbridge and Edison³. The WCF houses five (5) 500-hp centrifugal pumps designed to convey a maximum rated station capacity of 85-Million Gallons per Day (MGD) or approximately 57,000-gallons per minute of raw sewage from the North side of the Raritan River to the South side for primary & secondary treatment at the MCUA Central Treatment Plant. The station receives an annual average daily wastewater flow of 15.6-MGD from approximately 145,000 people and numerous commercial & industrial businesses. The WCF discharges into two (2) 60-inch force mains, (a primary and a redundant force main) located in a 15-foot diameter tunnel that crosses beneath the Raritan River for approximately 4,000 linear-feet.

Also located on the MCUAEPS site is the Olympic Landfill Gas Compressor Station (OLGCS) that utilizes three (3) – 200-hp compressors to convey landfill gas through two (2) 16-inch gas pipelines to a 20-MW Co-generation facility located at the MCUA Central Treatment Plant (MCUACTP). Both the sewage force mains and landfill gas pipelines are directed to and through an access shaft and then through the 4,000-ft long tunnel under the Raritan River – collectively referred to as the Northwest Access Shaft & Tunnel (NWAEST) – and then up through the southeast access shaft to MCUACTP. At MCUACTP, the wastewater then undergoes primary and secondary treatment while the landfill gas is used as a fuel source to generate up to 20-MW of power. In the event of a power failure, two (2) natural gas standby generators located within an appurtenant structure provide power to the WCF such that it can convey its rated 85-MGD flow.

During the incident period of October 26 through November 8, 2012, Hurricane Sandy (declared under DR-4086-NJ) was responsible for widespread power outages and multiple damages to municipal, county and state infrastructure. Record storm surge related to the event inundated and shutdown the entirety of MCUAEPS. The WCF was consequently unable to convey sewage pending extensive repair of damaged components. The main pumps, control valves, monitoring systems, and motors were completely submerged within the lower sections of the WCF for several days as a result of the event, and critical electrical components on the entry level of the facility were rendered inoperable due to partial submergence in flood waters. Starting from the time that the storm surge hit the facility through November 7, 2012, estimated 156 million-gallons of raw sewage was spilled into the Raritan River and Raritan Bay. During that time the MCUA and its emergency contractor constructed an emergency bypass pumping system that was activated on November 7, 2012. The Edison pumping facility then continued to operate on emergency bypass pumping (maximum capacity of 22 MGD) until emergency repairs of the main conveyance pumps, motors, controls, and power distribution equipment enable a slow and coordinated systematic return of main sewage pumps to operable condition. On November 19, 2012, the 1st main sewage pump was returned to service which combined with the emergency

² See Appendix C for an overall view of the existing MCUAEPS site that identifies the structures on the site.

³ See Appendix B for a map of the MCUAEPS service area.

by-pass pumps brought the conveyance capacity up to 52 MGD, or approximately 61 % of rated capacity. Over the next two months, the remaining four main sewage pumps were repaired and returned to service until all five main pumps finally became active on January 24, 2013. Although some permanent repairs have since been completed, permanent repair of other equipment critical to wastewater conveyance remains uncompleted to present day.

During the incident, the Northwest Access Shaft was also overtopped by greater than 1 foot of flood water. Salt water penetrated the opening of the top slab and flooded portions of the shaft & tunnel, thereby causing damage to equipment mounted both on top of the structure and enclosed within the shaft. Flooding inside of the shaft reached a depth of approximately ten (10) feet and extended approximately one thousand (1,000) linear-feet up the tunnel. Since the shaft's existing sump was rendered inoperable by the disaster, approximately eight days elapsed before MCUA personnel could dewater the brackish flood waters in the NWAŠT. Damage to the ventilation system within the shaft and tunnel further complicated permanent repair of equipment due to the strict confined-space entry requirements for the location. Presently, the equipment damaged by flooding on the top of the slab and the sump located within the shaft have been replaced; however, permanent repair of the NWAŠT gas sampling and detection system remains uncompleted.

4.0 ALTERNATIVES

FEMA is required under 44 CFR Part 10.4 to consider reasonable alternatives to recommended courses of action in any proposal that involves conflicts concerning alternative uses of resources. NEPA requires the analysis of practicable alternatives as part of the environmental review process for the proposed project. Inclusion of a No Action Alternative in the environmental analysis and documentation is required under NEPA. The No Action Alternative is used as a benchmark against which “action alternatives” may be evaluated. FEMA reviewed all applicable federal, state, and local laws and Executive Orders for each of the considered following alternatives, which included 1) restoration and upgrade of the MCUAEPS with a perimeter floodwall, isolation vault, bypass pumping system for the WCF and northwest tunnel access shaft riser ring, 2) separate floodwalls and mitigation for the WCF and NWAEST of the MCUAEPS, 3) wet floodproofing and relocation of the WCF and NWAEST.

4.1 No Action Alternative

The No Action Alternative for the facility would expose the MCUAEPS pump station, northwest access shaft and tunnel to future flooding events. While Hurricane Sandy caused flood surge to approximate elevation 13.34-ft, current FEMA mapping indicates that the WCF is located within a Coastal Zone AE with a 100-year flood elevation of 15.0-feet and the northwest access shaft is located within a Zone V with a 100-year flood elevation of 16.0-feet. A 100-year design flood event at MCUAEPS would therefore, be anticipated to cause greater damages than those experienced by Hurricane Sandy. Furthermore, the tunnel adjoining the shaft was designed as an open-air structure and is located in poor soils in which the tunnel is neutrally buoyant. The 100-year flood would there have the potential to fill the tunnel with approximately 20,000 tons of water and potentially result in irreparable settling, shifting, or breaking of the tunnel. It is also doubtful that the brick and block pump station building would be capable to withstand surge forces as flooding reaches the estimated 500-year flood elevation of 23.0-feet. A prolonged surcharge of raw sewage into the Raritan River would be probable under each of these failure scenarios. Hence, protecting the pump station and northwest access shaft & tunnel is critical for the conveyance of wastewater from MCUAEPS to MCUACTP. Accordingly, provided that a cost-effective flood hazard mitigation measure exists for the facility, the No Action Alternative is not feasible due to the risk posed to MCUAEPS and public environmental health & safety.

4.2 Proposed Action Alternative – Restoration and Upgrade

The Proposed Action Alternative for the mitigation portion of this work involves the construction of a perimeter flood wall, isolation vault, bypass pumping system, and northwest tunnel access shaft riser ring. These proposed measures will isolate MCUAEPS structures from surrounding floodwaters and thereby mitigate potential damages for flood events up to a 500-year recurrence interval⁴.

Flood Wall, Isolation Vault, and Bypass Pumping System for the WCF

⁴ Bypass pumping is necessary to achieve compliance with the NJDEP guidance regarding isolation of MCUAEPS and permitting of a point source discharge of untreated sewage from the pump station. In the absence of the bypass pumping capability, the proposed sluice gate could not be deployed to isolate the pumping station and the facility would be susceptible to internal flooding through the influent force main. The referenced letter from NJDEP is included as Appendix H.

Flood walls offer reliable flood protection and would also protect the MCUAEPS from collisions with minor debris. The flood wall involves the construction of a reinforced concrete wall with concrete-filled steel pile foundation to provide support against design flood loads. Flood wall construction will also require the construction of two access gates to permit vehicles into the facility as required for maintenance and repair.

An isolation sluice gate chamber and a stormwater pump station will also be required in order to prevent internal flooding of the pump station from the influent gravity sewer pipeline. The sluice gate chamber structure will be built to the flood wall elevation of 23.0-feet to further prevent the influent gravity sewer from flooding the pump station and area interior to the floodwall. A stormwater pump station would further provide control of rainfall runoff within the flood wall area.

Riser Ring for the NFAST

A new exterior, reinforced concrete wall will be constructed on top of the existing top slab for the northwest tunnel access shaft, and a new top slab would then be constructed at elevation 23.0-feet. All equipment mounted on the existing top slab would be relocated to the new top slab. Construction of new existing access stairs from site grade to the top slab is required. New access ways, ladders, and extensions to pipes, conduits, and utilities internal to the shaft would be required to accommodate the new top slab. This mitigation measure addresses the life and safety concerns by preserving the integrity of the tunnel and safeguarding continued conveyance of wastewater and landfill gas.

4.3 Alternatives Considered and Dismissed

The mitigation measures considered for mitigation of the Edison Pump Station were analyzed separately for the following two MCUAEPS structures:

- **Wastewater Conveyance Facility (WCF)** includes two interconnected structures, a principal and an appurtenant structure. The facility receives raw wastewater through influent 66-inch and 36-inch gravity pipelines. Five (5) 500-HP pumps operate to convey up to 85 MGD of wastewater through a common discharge header. The discharge header consists of a bi-directional pipeline that connects to two (2) 60-inch diameter force mains that leave the pump station and proceed to the Northwest Access Shaft & Tunnel. WCF is located within the Coastal Zone AE as delineated on the Preliminary FIRM.
- **Northwest Access Shaft & Tunnel (NFAST)** contains the two (2) 60-inch force mains which proceed down the 65-foot deep northwest shaft through a 4,000-foot long tunnel beneath the Raritan River before discharging to the headworks of the MCUACTP. The tunnel is 15-feet in diameter and is partially open allowing people to walk from one side of the Raritan River to the other to permit inspection and maintenance of the force mains. The northwest access shaft permits entry into the tunnel and is equipped with sump pumps, transfer pumps, ventilation and air monitoring equipment. NFAST is located within Zone V of the FEMA Preliminary FIRM.

4.3.1 WCF Wet Flood-Proofing

As stated within the Final Benefit Cost Analysis (BCA) Reference Guide (June 2009), wet flood-proofing of the WCF would involve “modification of the building to allow short-duration, low-level floodwaters to enter the building in a way that minimizes damage to the building and its contents.” Since the 500-year design flood corresponds to an estimated elevation of 23.0-feet - approximately 13-feet above the finished floor elevation – and has the potential to sustain this level of flooding for an extended duration, extensive reconstruction of the WCF facility would be required to permit wet flood-proofing. All immobile equipment such as the wastewater conveyance pumps, motors, and valves would require replacement with equivalent submersible units while all electrical equipment that cannot reasonably be made submersible would have to be placed on an approximately 3,600-square-foot concrete pad elevated above the design 500-year flood elevation. This critical equipment that would require elevation includes the main control panel, main pumps’ variable frequency drives, pneumatic instrumentation compressors, motor control center, two (2) natural gas generators, 480-V main power distribution & paralleling switchgear, power main transformer and 13.2-kV switch, bar screen motors, and the operator’s office equipment. The plant air system and lighting would be the sole remaining unprotected systems critical for routine operation of the facility yet not directly required for conveyance of wastewater flows. Overall, the high degree of technical complexity associated with such extensive reconfiguration of the existing WCF is liable to result in significant additional costs beyond those addressed within the preliminary construction cost estimate, making the action impracticable.

4.3.2 WCF Flood Wall with Isolation Vault & Bypass Pumping

Pursuant to the FEMA Preliminary FIRM, Map Number 34023C0152G, dated January 31, 2014, WCF is entirely located within a Coastal Zone AE whereupon construction of a flood wall is permissible. However, although flood walls offer reliable protection from external flooding and offer protection from collisions with minor debris, MCUAEPS is uniquely susceptible to internal flooding through the influent 66-inch reinforced concrete gravity pipeline that flows into the WCF wet well. In recognition of NJDEP guidance indicating that a point source discharge of untreated sewage from the pump station would likely not be permitted without treatment, this measure therefore primarily involves the following elements: the construction of a flood wall to protect WCF from external flooding; the construction of an isolation vault to protect WCF from internal flooding; and the installation of a bypass pumping system within the isolation vault structure as required to mitigate the potential for unpermitted discharge of untreated sewage.

4.3.3 WCF Relocation

Relocating MCUAEPS WCF to a location outside of the 500-year flood zone was also considered. In order to accomplish this relocation, a concept was developed to relocate the WCF to the south side of the Raritan River on the property of the MCUA Central Wastewater Treatment Plant (MCUACTP). This concept includes the demolition of WCF, directing gravity flow down the northwest access shaft and tunnel as an inverted siphon leading into the southeast shaft, and constructing a new shaft alongside the southeast access to host the replacement wastewater screening and pumping facilities at MCUACTP. Although this relocation is hydraulically feasible, the complexity and cost make this alternative impractical.

4.3.4 NWAST Wet Flood-Proofing

Wet flood-proofing is also not feasible for NWAST since the pooling of flood waters within the tunnel could potentially jeopardize the tunnel's structural integrity from hydrostatic pressure.

4.3.5 NWAST Elevation of Top Slab

This is the only feasible measure considered for protection of NWAST from the 500-year design flood that addresses the life and safety concerns by preserving the integrity of the tunnel and safeguarding continued conveyance of wastewater and landfill gas. This mitigation measure includes the installation of an additional concrete riser ring to elevate the existing access shaft top slab above the 500-year design flood elevation. A new exterior, reinforced concrete wall would be constructed on top of the existing top slab. A new top slab would then be constructed at elevation 23.0-feet and all equipment mounted on the existing top slab would be relocated to the new slab. Construction of new existing access stairs from site grade to the top slab is required. New access ways, ladders, and extensions to pipes, conduits, and utilities internal to the shaft would be required to accommodate the new top slab. However, since this is not a comprehensive approach it was dismissed.

4.3.6 NWAST Flood Wall

As previously noted, the Northwest Shaft is located in the V-Zone as shown on the Preliminary FIRM issued by FEMA in January 31, 2014. New construction is prohibited in V-Zones. Since the construction of an independent flood wall around the Northeast Access Shaft is a prohibited action, a flood wall is therefore an unacceptable alternative for mitigation.

4.3.7 NWAST Relocation

Relocation of the northwest access shaft is not possible since it serves as the access point to the 4,000-foot tunnel beneath the Raritan River.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section presents and analyzes the potential impacts and effects of the No Action Alternative and the Proposed Action Alternative on the environment. As established in the remainder of this section, no adverse long-term impacts to the environment are anticipated to occur as a result of the Proposed Action.

5.1 Physical Resources

5.1.1 Geology and Soils

Existing Conditions

The MCUAEPS is located within the Coastal Plain Physiographic Province, a region characterized by flat to gently undulating topography underlain by soil zones that gently dip towards the east. According to the New Jersey Geological Survey (USGS) maps of Surficial Geology of the South Amboy Quadrangle, Middlesex and Monmouth Counties, NJ, Map OFM (Open File Map) 18 (S. D. Stanford, 1995), the geologic setting in the vicinity of the site consists: of Artificial Fill (af); Estuarine Deposits (Qm) of Peat and organic-rich clay and silt; Raritan Terrace Deposit (Qrt) of Sand, silt, pebble gravel, minor clay and cobble gravel; Cretaceous Deposits, Undifferentiated of Sand, silt, and clay, underlain by Weathered Diabase (Kdw).

Review of Natural Resources Conservation Service (NRCS) Soil Survey information indicates site soils are comprised of Pawcatuck-Transquaking complex, with 0 to 2 percent slopes, and are frequently flooded. The complex is described as tidal marsh landform with herbaceous organic material over sandy marine deposits. Typical surficial soil profile consists of mucky peat to a depth of approximately 4 feet, underlain by a half-foot layer of loamy sand, followed by sand to a depth of 7.5 below grade as mapped by the Middlesex County Soil Survey. NRCS Soil Survey mapping indicates a depth to restrictive feature of greater than 80 inches, and a frequency of flooding of “very frequent”, as well as a frequency of ponding of “frequent”. Site-specific topography is generally undulating to flat, with ground surface elevations between 5 to 10 feet above mean sea level.

Soil borings were advanced at the project site in 2005 by Hatch Mott MacDonald to support site improvements. The soil borings were in general conformance with mapped site soils, with the following subsurface stratigraphy:

- Fill – Fill was observed in all borings ranging from approximately 9 to 40 feet thickness depending on the location. The fill material varied considerably and generally consisted of moist, very loose to very dense, light brown, brown, black, orange and gray, fine to medium-grained silty sand (USCS designation SM). With localized traces of gravel as well as moist, loose to medium dense, tan, gray, or black, fine-grained silty sand (SM) with trace clay.

- Estuarine Deposits (Qm) – Soft to hard clay and silt with organic material was encountered in most borings immediately beneath the fill. The layer generally consists of medium stiff to very soft to soft gray, dark gray, gray, black, and non-plastic organic rich clay; and silt (OL and OH) with shells, roots, peat and a trace of fine to coarse sand.
- Raritan Terrace Deposit (Qrt) – A two to twenty five foot thick layer of multi-colored (brown, light brown, gray, dark gray, black, and locally red, and white), medium dense to very dense fine to coarse clean to silty gravelly sand (SP-SW-SM) and sandy gravel (GP-GM) was encountered below the fill and estuarine deposits.
- Raritan Formation, Woodbridge Clay member (Krw) – Medium stiff to hard silty clay (CL) and clayey silt (ML) with sand, gravel, shells, organics, and vegetation fibers was encountered on the southeast side of the river below the shallower fill and organics above the Farrington Sand member. This deposit pinches out along the alignment under the Raritan River and thickens toward the southeast riverbank.
- Raritan Formation, Farrington Sand member (Krf) – Very dense fine to coarse clean sand (SW-SM) was encountered below the fill, estuarine deposits and Woodbridge Clay member. This deposit pinches out along the alignment under the Raritan River and thickens toward the southeast riverbank.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing geology or soils.

Proposed Action Alternative

The construction of a flood wall would disturb existing soils via excavation along the wall perimeter. Pre-construction proof rolling may reveal compressible soils at an unexpected grade close to the surface. These areas will require excavation and backfill with controlled compacted fill. Deep excavations will require dewatering, surging and cofferdaming to stabilize side walls. Additional drilling during pile installation may be necessary to address erratics encountered in the subsurface. The construction activity will generate localized instabilities in soil-water relationships that are temporary in nature. Construction performed in conformance with engineered plans and with approved erosion and sediment control plan The construction activity will generate localized instabilities in soil-water relationships that are temporary in nature. Soil-water equilibrium will return when construction is complete.

5.1.2 Site Contamination and Solid & Hazardous Waste Considerations

Existing Conditions

There are no known uncontrolled hazardous materials at the MCUAEPS site. Testing for priority pollutants will be completed during a site investigation. The site is not a known Area of Concern, which is defined by the NJDEP as, “Any existing or former distinct location or environmental medium where any hazardous substance, hazardous waste, or pollutant is known or suspected to

have been discharged, generated, manufactured, refined, transported, stored, handled, treated, or disposed, or where any hazardous substance, hazardous waste, or pollutant has or may have migrated,” (N.J.A.C. 7:26E-1.8).

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not impact hazardous materials.

Proposed Action Alternative

Materials that may be classified as hazardous, such as petroleum, may be present on-site during construction. In addition, Diesel fuel will be stored on-site in secondary containment. In the unlikely event of a diesel fuel or other hazardous material spill or leak, best management practices (BMP) would be utilized. Such practices include having procedures in place and materials on hand to control and contain spills. Incidents would be reported in accordance with NJDEP regulations. Based upon the minimum amount of hazardous materials on-site and the implementation of BMP and spill control during project construction, neither of the alternatives is expected to have an adverse impact associated with hazardous materials.

5.1.3 Air Quality

The Clean Air Act (CAA) of 1963 (amended 1970, 1977, and 1990) requires each state to attain and maintain specified air quality standards. National Ambient Air Quality Standards (NAAQS) have been promulgated by the Federal government and by New Jersey for carbon monoxide (CO), nitrogen dioxide (NO₂), total suspended particulate (TSP), sulfur dioxide (SO₂) and lead (pb). New Jersey standards are set in the September 2014 State Implementation Plan (SIP) Revision and are generally the same as the Federal standards for these pollutants. Primary air quality standards are set to protect human health and secondary standards are set to protect human welfare.

Federally-funded actions are subject to General Conformity under Subpart B of 40 CFR Part 93, unless otherwise exempted or related to highway or transit projects regulated under Subpart A. Other types of Federally-funded actions are subject to General Conformity under Subpart B, unless exempted. The air conformity analysis process ensures that emissions of air pollutants from planned Federally-funded activities would not affect the state’s ability to achieve the CAA goal of meeting the NAAQS. Section 176(c) of the CAA requires that Federally-funded projects conform to the purpose of the State Implementation Plan (SIP), meaning that Federally-funded activities would not cause any violations of the NAAQS, increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any interim milestone. The emissions from construction activities are subject to air conformity review for non-attainment areas, unless they are shown to be below the applicable *de minimis* levels.

Existing Conditions

Background ambient air quality in the vicinity of the project site can be characterized by data collected throughout New Jersey by the NJDEP Bureau of Air Quality at various sampling stations located throughout the state. These stations measure standards for total suspended

particulate matter, inhalable particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone and lead as established by NJAC 7:27-13. Due to their proximity to the project site, the Rahway and New Brunswick monitoring stations were primarily used to establish concentration statistics. In some instances, the Jersey City station was utilized since only stations within specific areas exist throughout the state for monitoring a compound specific to urban environments.

Based upon review of the most recently published New Jersey air quality data, the immediate project study area was not in violation of the air quality standards for total suspended particulate matter, inhalable particulate matter (PM-10) sulfur dioxide, carbon monoxide, nitrogen dioxide, and lead which is monitored at specific air quality monitoring sites located in proximity to the project location. Ozone concentrations exceeded the standard on eleven days throughout the sampling year, however this was not uncommon as ten of fourteen sampling sites posted similar data violating ozone standards. It should also be noted that the sampling station referenced within proximity to the site was also below the statewide average.

For the 8-hour ozone standard, the exposure limit standard of 0.075 ppm is governed by the average of the fourth highest daily maximum 8-hour average concentration recorded each year for three years. Given this criteria, it is noted that the State of New Jersey in its entirety is classified as being “Marginal” as identified in the latest available and published NJDEP Annual Air Quality Report. A “Marginal” classification is applied when an area has a design value of 0.085 ppm up to but not including 0.092 ppm. The Edison Pump Station site is located closest to the air monitoring station at Rutgers University in New Brunswick, NJ which has reported the highest 8-hour daily maximum concentration of 0.075 ppm in the previous 3 year period to 2013.

Two categories, primary and secondary, are established for ambient air quality standards and are regulated by the NJDEP. Primary standards are set to protect the public, including the health of air quality-sensitive populations while secondary standards define limits to protect public welfare such as detriment to animals, crops and vegetation, buildings, and visibility. The standards are measured in conjunction with background air quality concentrations and the aggregate with emissions from facilities or operations must remain below the applicable pollutant value. See Appendix I for a table presenting the 2012 ambient air quality data for the criteria pollutants listed within this section. The data was obtained from the latest Air Quality Summary Report available (2012), prepared by the NJDEP, Bureau of Air Monitoring.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing air quality at MCUAEPS.

Proposed Action Alternative

The Edison Pump Station site is located closest to the air monitoring station at Rutgers University in New Brunswick, NJ which has reported a highest 8-hour daily maximum concentration of 0.075 ppm in the previous 3 year period to 2013. As the maximum concentration did not exceed the ozone standard, it is reasonably expected that routine daily ozone concentrations are less than the prescribed exposure limit standard. Given the extent and

magnitude of the construction activities, it is therefore anticipated that there will be no adverse effect on existing ozone concentrations which would contribute to exceedance of the prescribed exposure limit standard for ozone.

The Proposed Action Alternative would have a temporary, minimal impact on air quality during construction activities; no long-term impacts are expected as power and backup power are not being provided through this project. Construction activities on the project site may have a potential impact on the local air quality through the generation of fugitive dust or airborne dust. Fugitive dust is generated during ground breaking and excavation activities. Emissions from diesel construction vehicles are also a potential source of air pollution. The use of BMP would help minimize dust and vehicle emissions. As the potential operational and construction emissions are expected to be below the applicable *de minimis* levels, no general conformity analysis is required, and the Proposed Alternative would not result in adverse effects on air quality.

5.2 Water Resources

5.2.1 Water Quality

Existing Conditions

All surface waters within and adjacent to the planning area are located in one of two watersheds listed below. The overall area within the two basins serviced by the MCUAEPS is approximately 25 square miles.

1. The southern portions of Woodridge Township and the City of Perth Amboy are located in the Lower Raritan River basin, near its convergence with the Raritan Bay.
2. The remainder of the two municipalities, along with the entire Borough of Carteret, are located in the Rahway River / Woodbridge Creek basin. Both waterways discharge directly into Raritan Bay.

The proposed project area lies entirely within the Raritan River drainage basin. The River and its tributaries drain an area that encompasses portions of seven (7) counties as follows: Middlesex, Monmouth, Mercer, Morris, Somerset, Hunterdon and Union. The proposed project area is located on the northern bank on the main stem of the lower Raritan's (near its discharge to the Raritan Bay). For the most part, this drainage basin is densely populated with industrial and commercial centers throughout and is also navigable by commercial shipping in the area. The river in the project area is tidal in nature.

Surface/Groundwater Quality

All of the water in the lower Raritan River watershed has been classified by NJDEP as FW-2 (Fresh Water Trout Maintenance), FW-2-NT (Fresh Water Non-Trout) and/or SE-1 (Saline Estuary), depending on the waters location relative to the tidal boundary. The waters in the project area are classed as a saline estuary SE-1. A search for relevant water quality data from NJDEP, USEPA and USGS databases indicated that no ambient water quality monitoring

stations exist in the Lower Raritan in the vicinity of the proposed project because of the tidal influence.

Surface/Groundwater Quantity

Water supply for the project area originates from the Delaware River. It is conveyed via the Delaware Raritan Canal system, passes through the City of New Brunswick, to a surface water treatment plant in Edison, NJ, for further distribution. The Middlesex Water Company is the water purveyor for the planning area. There are no sole source aquifers or critical impact areas within the planning area.

Three (3) municipalities are served by the MCUAEPS. The City of Perth Amboy operates a municipal water system drawing water from shallow wells near the Raritan River. Woodbridge Township has two (2) water utilities (Middlesex Water Company and Elizabethtown Water Company), while the Borough of Carteret is served entirely by Middlesex Water Company. Both Water Companies primarily draw surface water from the Raritan River and/or the Delaware and Raritan Canal, while Elizabethtown supplements their supply with a number of wells throughout their service area.

Surface/Groundwater Hydrology

The proposed project area is entirely within the drainage basin of the Raritan River, which flows into Raritan Bay just downstream of the project area. The River and its tributaries drain an area that encompasses portions of seven (7) counties as follows: Middlesex, Monmouth, Mercer, Morris, Somerset, Hunterdon and Union. For the most part, this drainage basin is densely populated with industrial and commercial centers throughout and is also navigable by commercial shipping in the area around the proposed project.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative will not directly affect water quality, quantity, or hydrology. However, this alternate does not mitigate the potential for flooding to disable MCUAEPS and result in another raw sewage spill into the Raritan River.

Proposed Action Alternative

Surface Water Quality

The construction of the project will have minimal impact on surface water quality within the project area. Soil erosion and sediment control devices will be used throughout the project area as required by the Freehold Soil Conservation District; which has review and enforcement authority. The installed environmental devices will minimize the amount of soil erosion run-off into the Raritan River.

Groundwater Quality

This proposal will require dewatering at the MCUAEPS site for the construction of the isolation vault structure adjacent to the existing WCF principal structure. No groundwater impacts are anticipated and if contaminated water is encountered it will be conveyed to the Sayreville Wastewater Treatment Plant for treatment. At this time, it is not anticipated that a temporary

dewatering permit will be required for the project, as projected dewatering will take place for fewer than thirty (30) days in any year; however, if unexpected difficulties result in a permit being required, it will be obtained from the Bureau of Water Allocation at NJDEP.

Stream Corridors – Red Root Creek is located to the north of the MCUAEPS. The proposed project site and staging area is located approximately 300-feet away from the stream edge. Best Management Practices will be utilized to ensure minimal impacts.

Aquifer Recharge Areas –The project area lies within the outcrop area of the Middle Aquifer of the Potomac-Raritan-Magothy Aquifer Group, locally known as the Farrington Formation. The project is not expected to impact aquifer recharge areas.

Coastal Areas – The project site is not located within the jurisdictional area of the Coastal Area Facilities Review Act (CAFRA); therefore, no CAFRA permit is required for the project.

5.2.2 Wetlands

Existing Conditions

Coastal and freshwater wetland habitats have been delineated adjacent to the MCUAEPS site as shown on the drawing included as Appendix D in this report. Wetland habitats consist predominantly of herbaceous brackish water plant species with some minor wetland shrubs. The observed wetlands are typical of this coastal environment and the species recorded are described in the Vegetation section below. MCUA will file Waterfront Development, Coastal Wetlands and Freshwater Wetlands permit applications as required by the New Jersey Department of Environmental Protection (NJDEP) for impacts within the waterfront and impacts to wetlands. No permanent disturbance to any wetland habitats are expected and all temporarily disturbed areas, where applicable, would be restored as part of the proposed project. All wetland regulated areas outside of the existing MCUAEPS's fenceline that are proposed to be disturbed during construction phases of work would be restored to original elevations with appropriate seeding at the end of the project.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative will not affect wetlands.

Proposed Action Alternative

There are two regulatory wetland habitat types adjacent to the MCUAEPS. The NJDEP coastal wetlands (Coastal Wetlands Act of 1970) are mapped adjacent to the MCUAEPS with an approximate 70-foot section directly adjacent to the eastern fenceline. Coastal wetlands that are mapped adjacent to the MCUAEPS would be impacted by the temporary construction road for the installation of the northwest tunnel access shaft riser ring, but no permanent impact would occur. A permit will be obtained as part of the NJDEP permit application package.

There are also regulated freshwater wetlands delineated along the remaining northeast and southeast fencelines. The Proposed Action Alternative would require two NJDEP freshwater

wetland permits since the Proposed Action would occur within freshwater wetlands and their transition areas. The transition area widths are likely to be 50 feet wide for isolated freshwater wetlands and 150 feet for all other freshwater wetland delineated due to identified State threatened and endangered species in the area. No permanent impacts would occur to freshwater wetlands and wetland areas impacted would be restored to pre-existing conditions. These proposed temporary freshwater wetland impacts are related to access outside of the fenceline for the installation of the northwest tunnel access shaft riser ring.

5.2.3 Floodplains

Existing Conditions

Executive Order 11988 requires Federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Activities within the floodplain require the agency to conduct an assessment, such as this report, to evaluate proposed investments in floodplain locations. The majority of the Facility is located within the 100-year Coastal Zone AE of elevation 15.0-feet and is situated within an estimated 500-year floodplain of elevation 23.0-feet as established within the Hatch Mott MacDonald Basis of Design Memorandum⁵. An 8-step Floodplain Decision-Making notice is included in Appendix P.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would promote continued floodplain occupancy, and, since no flood mitigation would be performed, it is expected that the MCUAEPS would be subjective to repetitive losses causing raw wastewater releases that are harmful to public health and the environment.

Proposed Action Alternative

The construction of a flood wall under the Proposed Action Alternative would promote continued floodplain occupancy and development; however, the flood wall would minimize the risk of future flood damage to MCUAEPS, thus promoting continued operation during flood events and decrease the risk for releases of untreated sewage into the environment. The floodwall would be designed to withstand 100-year and 500-year design flood wave loads per Flood Wall Wave Loads report included as Appendix N. Significant local alteration of the flood plain capacity at the MCUAEPS site would not occur as a result of the Proposed Action Alternative. Given the relative areas of the flood plain and the project, alteration of the flood plain due to secondary impact is highly unlikely. Also, given the estimated design 500-year flood elevation 23.0-feet, the total volume of water displaced by the Proposed Action Alternative is approximately 375,000-cubic-feet⁶. Any potential impacts would be addressed through a capital review before the local planning board. Ultimately, the project's benefits to human health, safety, welfare, and environment outweigh the minor or negligible adverse effects of the Proposed Action Alternative.

⁵ See Appendix L for referenced memorandum.

⁶ See Appendix K for supporting calculations.

5.2.4 Coastal Resources

Existing Conditions

The MCUAEPS is located near Red Root Creek and the Raritan River. Red Root Creek (FW-NT/SE1) is located approximately 215 feet north of the site's northern fence boundary and the Raritan River (FW-NT/SE1) is located approximately 75 feet from the project site's eastern fence boundary.

Coastal wetlands as mapped by NJDEP (Wetlands Act of 1970) are located approximately 115 feet from the northern fenced boundary and directly adjacent to approximately 70 feet of the eastern fence boundary. The mapped coastal wetland boundary line then begins to turn south/southeast away from the MCUAEPS, following the shoreline of the Raritan River. Coastal resources related to plants and animals are addressed in Section 6.5 below.

According to the U.S. Fish and Wildlife Service, the "*Coastal Barrier Resources Act (CBRA) of 1982 established the John H. Chafee Coastal Barrier Resources System (CBRS), a defined set of coastal barrier units located along the Atlantic, Gulf of Mexico, Great Lakes, Puerto Rico, and U.S. Virgin Island coasts.*" In general, Federal and financial assistance are prohibited within the CBRS. The CBRS contains two types of units, System units and Otherwise Protected Areas (OPA). OPAs are denoted with a "P" at the end of the unit number.

The three closest USFWS mapped CBRS units are noted as NJ-02, NJ-03P, and NJ-04. These are all found along the Atlantic Ocean shoreline and these CBRS units are more than 6 miles downstream of the project site. Please refer to the USFWS John H. Chafee Coastal Barrier Resources System (New Jersey) mapping: <http://www.fws.gov/CBRA/Maps/Mapper.html>.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing coastal wetlands or any CBRS mapped units.

Proposed Action Alternative

The Proposed Action Alternative will have minimal or negligible effects to coastal resources as most of the work would be contained within the existing fence line of the MCUAEPS. All permanent impacts would be contained within previously developed and/or disturbed areas of the MCUAEPS. The proposed temporary impacts to delineated freshwater wetlands will be permitted under the Freshwater Wetlands Protection Act rules. Mapped coastal wetlands adjacent to the MCUAEPS would be impacted by the temporary construction road necessary for the installation of the northwest tunnel access shaft riser ring and no permanent impact would occur as the area would be restored. No CBRS mapped units would be impacted by the proposed project as the nearest mapped unit is more than 6 miles downstream of the site.

All required permit(s) will be obtained as part of the NJDEP permit application package. The Proposed Action Alternative would also adhere to all soil and erosion control and stormwater requirements and as such, MCUA would also obtain a Water Quality Certification as part of the permit(s) approval process. Therefore, minimal or negligible affects would occur to coastal resources and water quality during construction phase of work and no long-term impacts would occur to any local coastal resources, waterways or bays. Long-term benefits would result for the proposed action as the MCUAEPS would be protected during extreme weather conditions.

The State of New Jersey has jurisdiction under the Coastal Zone Management (CZM) Program as approved by the Secretary of Commerce on September 29, 1978. The NJDEP, through its permits program, would only approve projects that have CZM consistency. Therefore, the proposed activities comply with and will be conducted in a manner that is consistent with the New Jersey State Coastal Zone Management Program.

5.3 Biological Resources

5.3.1 Vegetation

Existing Conditions

Based on a site visit on July 18, 2014, land within the fenceline consists of gravel areas, paved/disturbed areas and maintained lawn areas. There are four honey locust (*Gleditsia triacanthos*) trees observed growing on the maintained lawn. All aboveground buildings and associated above ground features are located within the fenced in area so minimal vegetation exist inside the MCUAEPS.

Wetland habitats were observed and delineated to the north and east of the MCUAEPS. An existing railroad track and gravel storage yard was observed south of Olympic Drive and was generally void of vegetation. An existing railroad track and gravel access road is located to the west of the fence line. An isolated wetland pocket was also delineated west of the gravel access road.

Vegetation observed was consistent with coastal vegetation associated with brackish water environments adjacent to the Raritan River. Dominant species observed to the north and east of the existing site include common reed (*Phragmites australis*), and groundsel bush (*Baccharis halimifolia*). Other species observed include, but are not limited to, Pennsylvania smartweed (*Polygonum pennsylvanicum*), American germander (*Teucrium canadense*), common threesquare (*Schoenoplectus pungens*), salt-marsh bulrush (*Scirpus robustus*), seaside goldenrod (*Solidago sempervirens*), rose mallow (*Hibiscus moscheutos*) and saltmarsh cordgrass (*Spartina alterniflora*) nearer to the coastline. The areas to the south and west of the fence line were mostly gravel/paved surfaces with some areas of maintained lawn and typical roadside weeds present. As noted above, the interior of the existing pump station has four planted trees (honey locust - *Gleditsia triacanthos*) growing on a maintained lawn.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing wetlands.

Proposed Action Alternative

The Proposed Action Alternative would have permanent impacts to some grass lawn areas within the fenceline of the MCUAEPS. Once the Proposed Action Alternative is completed, previously existing grass lawns would be reseeded and maintained.

Freshwater wetlands, and therefore wetland vegetation (i.e., common reed) would be temporarily impacted by the Proposed Action Alternative. The proposed installation of the northwest tunnel access shaft riser ring will require temporary road access through delineated freshwater wetlands outside of the fenceline. This wetland area would be reseeded after construction. However, common reed is expected to become dominant. Therefore, the Proposed Action Alternative would have minor short-term construction impacts to common reed vegetation along the fenceline and no long-term adverse impacts would occur to any wetland vegetation.

5.3.2 Agricultural Lands

Existing Conditions

No farmland was observed while driving within the project site and adjacent areas. Also, a table top review of the NJDEP's NJ- GeoWeb data base shows no farmland mapped on or adjacent to the MCUAEPS.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not impact agricultural lands.

Proposed Action Alternative

The Proposed Action Alternative would not impact agricultural lands.

5.3.3 Threatened and Endangered Species and Critical Habitat

Existing Conditions

The NHP was contacted for the review of threatened and endangered species. According to the NHP response letter dated July 22, 2014, five species were found to be within one mile of the referenced site⁷. Little blue heron foraging (*Egretta caerulea* – State special concern), northern harrier breeding sighting (*Circus cyaneus* – State endangered), osprey nest (*Pandion haliaetus* - State threatened), snowy egret foraging (*Egretta thula* – State special concern), and yellow-crowned night-heron foraging (*Nyctanassa violacea* – State threatened) were identified as potentially utilizing habitat within one mile of the site. It is not expected that any threatened,

⁷ See Appendix F for NHP response letter.

endangered, and or rare species would be utilizing the pump station since there is no habitat for species to forage or breed on the property.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing wildlife and fish.

Proposed Action Alternative

No rare, threatened or endangered species would be impacted by the proposed work and no mitigation is required.

5.3.4 Wildlife and Fisheries

Existing Conditions

The wildlife found at and adjacent to the project site is typical of coastal areas in central New Jersey. Common song birds and gulls are expected to utilize the area. Based on NJ-GeoWeb and the New Jersey Natural Heritage Program (NHP) response letter dated July 22, 2014, there are records of State threatened and endangered species of birds such as yellow-crowned night-heron, little blue heron, glossy ibis, snowy egret, osprey, bald eagle and northern harrier (breeding) directly at or near the MCUAEPS. Other common mammal species such as white-tailed deer, gray squirrel, raccoon, and etc. would be expected to be a part of the local biological community. The tidal portions of the Raritan River host migratory salt water species such as striped bass, fluke, winter flounder, weakfish and bluefish. There are numerous other species of fish found along the Raritan River including anadromous species such as alewife or river herring (*Alosa pseudoharengus*), blueback herring (*Alosa sapidissima*), American shad (*Alosa aspidissima*), striped bass (*Monroe saxatilis*), Atlantic sturgeon (*Acipenser brevirostrum*), Shortnose sturgeon (*Acipenser brevirostrum*) and American eel (*Anguilla rostrata*).

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing wildlife and fish.

Proposed Action Alternative

The Proposed Action Alternative will have permanent and temporary impacts to regulated areas within the existing MCUAEPS fence line. Proposed physical improvements that would displace existing open areas would be permanent impacts and all temporarily impacted areas would be mitigated and restored at the end of the project.

Within this disturbed/developed area of the MCUAEPS, no permanent or long-term impact is expected to any rare, threatened or endangered species or their habitats. A water quality certification would be obtained as part of the project approval process. Minor or insignificant short-term impacts may occur to some wildlife species that live outside of the fenceline during construction phases of work. Minor rodent species and some local bird species (e.g., herons and gulls) may keep away from the MCUAEPS during construction but would return after the project

is completed. Short-term impacts to local wildlife would be insignificant or minor and no long-term impacts would be expected to any local wildlife.

The Proposed Action Alternative would have temporary impacts to wetlands outside of the MCUAEPS fence line. This temporary road impact would include the removal of common reed/*Phragmites* to allow necessary access from outside areas for the installation of the northwest tunnel access shaft riser ring. Once construction is completed, the area would be restored to original pre-existing condition and seeded with an appropriate seed mix. The Proposed Action Alternative outside of the fence line would therefore have insignificant or no impact to any rare, threatened, or endangered species or their habitats.

5.4 Cultural Resources

As a Federal agency, FEMA must consider the potential effects funded actions have on cultural resources prior to engaging in an undertaking. This obligation is defined in Section 106 of the National Historic Preservation Act (NHPA). The NHPA of 1966, as amended, defines a historic property as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register.” Eligibility criteria for listing a property on the National Register of Historic Places (NRHP) are found at 36 C.F.R. Part 60.

FEMA completed a comprehensive review that resulted in a consultation which was reviewed by and is on file at the New Jersey Historic Preservation Office (NJ-HPO). In consideration of the consultation’s findings, the NJ-HPO concurred with FEMA’s determination of No Adverse Effect to Historic Properties in a letter dated April 16, 2015. All FEMA-NJHPO correspondence can be found in Appendix O.

5.4.1 Historic Properties

Existing Conditions

The Edison Pump Station is located within Edison Facility (Raritan Arsenal) historic district ID#4527. As detailed in the Former Raritan Arsenal USACE Fact Sheet dated April 2010:

Raritan Arsenal occupied approximately 3,200 acres... [and] was used extensively for U.S. Army operations from 1917 to 1963. Operations included receipt, storage, and maintenance of ammunition shipped from other ordnance facilities or returned from overseas; renovation of ammunition designated for long-term storage; the salvage of outmoded or seriously deteriorated ammunition; ordnance research and development; and shipment and receipt of weapons.

Approximately four years after closure of the former arsenal, Edison Pump Station was constructed on a parcel that is believed to have been unused by the former arsenal. This is consistent with the NJDEP HPO determination in correspondence with Hatch Mott McDonald dated November 3, 2004 (Appendix G) in which the HPO established (1) that “[t]here are no archeological or historic properties on the site locations” and (2) “it is unlikely that historic or

pre-historic cultural material will be discovered at the three locations along the Raritan River”, one of which was the Edison Pump Station site.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect historic properties.

Proposed Action Alternative

Pursuant to the April 3rd, 2015 letter included as Appendix O, both NJDEP and FEMA have concurred in their determination that the Proposed Action Alternative will result in no adverse effect to historic properties.

5.4.2 Archaeological Resources

Existing Conditions

The Edison Pump Station was constructed between 1966 and 1967. During construction, a large portion of the project site was excavated to a depth of approximately 27-feet below grade. Therefore, and in accordance with the NJDEP HPO letter dated November 3, 2004, “[d]ue to various ground disturbances, mining and poorly drained soils it is unlikely that historic or pre-historic cultural material will be discovered at the three locations along the Raritan River”, one of which was the Edison Pump Station site.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect archaeological resources.

Proposed Action Alternative

The Proposed Action Alternative would disturb existing soils, however it is not anticipated that they would affect archaeological resources. If unexpected discoveries are made and unrecorded cultural resources are encountered during the course of project execution, all work will cease and NJDEP HPO will be contacted immediately

5.5 Aesthetic Resources

Existing Conditions

The MCUAEPS site, officially designated as Block 114, Lot 100.02 on the Woodbridge Township Tax Map in Middlesex County encompasses approximately 1.2 acres and is located in an M-2 Heavy Industrial Zone⁸. The two adjacent properties, officially designated as Block 134, Lot 100.02, and Block 114, Lot 3, are located in a Keasbey Redevelopment Area where the

⁸ Woodbridge Tax/Zoning Maps
<http://www.twp.woodbridge.nj.us/Departments/DivisionofEngineering/TownshipTaxMaps/tabid/2176/Default.aspx>

recommended use is for industrial purposes and/or commercial mixed used purposes. A warehouse building is situated on the property located to the southeast and railroad tracks are located on the opposing side of the roadways to the southwest and northwest of the MCUAEPS site.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not impact the existing aesthetic resources.

Proposed Action Alternative

Although the proposed flood wall would extend approximately 16-feet above the predominant grade at the MCUAEPS site, only a minor impact on the aesthetic value of the location is anticipated due to the industrial character of the adjacent properties. Special consideration will be given to the color of the wall prior to construction such that any adverse impact to aesthetics associated with the proposed flood wall may be mitigated.

5.6 Socioeconomic Resources

5.6.1 Socioeconomics

Existing Conditions

The Washington Canal and the Raritan River are connected, and subsequently discharge into the Raritan Bay. The Raritan River and Bay both support a robust shellfish industry. Currents out of the Raritan Bay can also travel along the shore of Monmouth and Ocean Counties. During 2012, tourism at the Jersey Shore brought in approximately \$6.3 billion to these two (2) Counties. This is significant part of New Jersey's economy.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would have adverse impacts on the local economy. Wastewater discharged from flood events could affect the shellfish industry in the Raritan River and Raritan Bay, as raw wastewater discharges can force the State to close the clamming beds due to public health concerns. Furthermore, currents out of the Raritan Bay can draw the wastewater along the shores of Monmouth and Ocean Counties, harming the Jersey Shore tourism. The MCUA would also be forced to spend public funds on repairs after every flood event and pay fines for releases of raw sewage. These expenses would be directly translated to the user in terms of sewer rate increases.

Proposed Action Alternative

The cost to implement the Proposed Action Alternative may potentially have a temporary impact on the users in terms of sewer rate increases; however, the Proposed Action Alternative would enable MCUA to continue and/or quickly restore wastewater service in future flood events.

5.6.2 Environmental Justice

Existing Conditions

The goal of Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) is to, “Identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations.” The USEPA Environmental Justice Mapper indicates there are no Environmental Justice communities near the proposed project site.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative does not pose a disproportionately high and adverse human health or environmental effects on minority and low-income populations.

Proposed Action Alternative

The Proposed Action Alternative does not pose a disproportionately high and adverse human health or environmental effects on minority and low-income populations.

5.6.3 Noise

Existing Conditions

Noise associated with the existing project site is limited to operation of the wastewater pumping station. There is some existing noise due to proximity to the Garden State Parkway; however, traffic to the facility is limited to facility personnel.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing noise conditions.

Proposed Action Alternative

Increased localized noise will occur during construction of this project. In order to mitigate the impact of the noise on the surrounding community, construction will be limited by the contract documents to normal working hours of 8 am to 5 pm. In addition, the project area is remote and isolated away from residential areas.

5.6.4 Traffic

Existing Conditions

The existing roadways leading to the proposed project site are subject to infrequent use by commercial and industrial businesses. A traffic study has consequently not been performed for the roads leading to the project site. At present, minor levels of traffic are experienced for construction work pertaining to the construction of a nearby power generation facility and greywater transmission pipeline.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not affect existing traffic conditions.

Proposed Action Alternative

Short-term traffic disruptions may occur as a result of construction activities. However, these impacts are anticipated to be minimal, and these impacts will end with the completion of construction. Long-term impacts due to secondary growth are unlikely, as the area immediately surrounding the project site is likely to remain undeveloped.

5.6.5 Public Service and Utilities

Existing Conditions

MCUAEPS provides wastewater pumping services to a combination of residential, commercial, and industrial users as previously noted. The facility conveys an annual average daily wastewater flow of 15.6-MGD and is rated to convey an 85-MGD wastewater flow. Also located on site is the Olympic Landfill Gas Compressor Station that utilizes three (3) – 200-Hp compressors to convey landfill gas through two (2) 16-inch gas pipelines to a 20-MW Co-generation facility located at MCUACTP. Power for the MCUAEPS facilities is provided by PSE&G.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative will not impact public services and utilities.

Proposed Action Alternative

In order to finance the construction of the project, increases in user fees may occur. However, at this time MCUA is not anticipating an increase in user fees due to this project. The construction of flood mitigation measures under the Proposed Action Alternative will further serve to mitigate the potential damages and therefore potential loss of wastewater service associated with flood disaster events such as Hurricane Sandy. Although the existing wastewater conveyance equipment at MCUAEPS will be taken offline during construction, the 85-MGD rated conveyance capacity of the pump station will be maintained throughout construction. The Proposed Action Alternative is therefore not anticipated to significantly impact public services and utilities while simultaneously improving the reliability of the station in the event of future flood disaster events.

5.6.6 Public Health and Safety

Existing Conditions

The MCUAEPS pump station is rated for the conveyance of 85-MGD of wastewater in accordance with its TWA permit and conveys an annual average daily wastewater flow of 15.6-MGD. As previously noted, the damage inflicted by the Hurricane Sandy disaster flood

event rendered the entire facility inoperable and resulted in the spillage of raw sewage into the Raritan River for a period of 9-days. Based upon Preliminary Flood Insurance Rate Maps issued by FEMA, the 100-year flood elevation is anticipated to increase by 5 to 6 feet relative to the flood elevation published in year 2010. The frequency of potential flood events which could result in repeated damages is therefore anticipated to increase significantly for the location and represents a potential liability for Public Health and Safety if the potential for future raw sewage spillage events is not mitigated.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative does not address the potential liability to Public Health and Safety that is indicated based upon the increased frequency of flooding events that is depicted on FEMA Preliminary FIRM.

Proposed Action Alternative

The Proposed Action Alternative will mitigate the potential for raw sewage spillage events through the construction of a flood wall in combination with a bypass pumping system. While the flood wall will protect MCUAEPS equipment from potential flooding up to the design 500-year flood elevation of 23.0-feet, the bypass pumping system will be operated during the storm in order to continue wastewater conveyance during prospective flood events. Provided that either utility power or natural gas power generation is available at MCUAEPS throughout prospective flood events, the bypass pumps will therefore be able to convey approximately 63-MGD of wastewater and mitigate the risk of future raw sewage spills as experienced during Hurricane Sandy.

5.7 Climate Change

Existing Conditions

Middlesex County has significant seasonal and daily temperature fluctuations. Winters are typically cool with moderate snowfall, and summers are moderate with hot mid-summer weather and frequent thunderstorms. Average temperatures range from 73 degrees Fahrenheit (°F) in the summer months to 34°F during winter months. Annual precipitation averages 48.78 inches with little seasonal variation in rainfall. The growing season lasts approximately 180 days beginning in late April and ending in middle to late October.

Climate change is expected to raise global temperature, alter average weather conditions, and increase sea levels. It is projected that these changes will cause more frequent and extreme weather events at or exceeding the magnitude of Hurricane Sandy.

Potential Impacts and Proposed Mitigation

No Action Alternative

The No Action Alternative would not exacerbate climate change, however it would fail to address the expectation for more frequent flood events of greater severity that are anticipated to result as a consequence of climate change.

Proposed Action Alternative

The Proposed Action Alternative would not exacerbate climate change, however it would address the expectation for more frequent flood events of greater severity that are anticipated to result as a consequence of climate change.

5.8 Cumulative Impacts

Cumulative effects are defined by the Council on Environmental Quality as, “The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person takes such actions.”

No Action Alternative

The No Action Alternative would not address the potentially significant adverse short-term and long-term impacts associated with such a potential for repeated spillage of raw wastewater and is therefore not viable. Repeated flood events and temporary fixes would permanently wear down the useful life and operability of the facility. Not implementing the permanent restoration throughout the Subgrantee facilities would result in the eventual failure of temporary emergency measures and ultimately the entire Facility, resulting in raw sewage discharge into the Raritan River and Raritan Bay.

Proposed Action Alternative

Given that the MCUAEPS will be restored to pre-storm condition and upgraded in the near future, the Proposed Action Alternative is necessary to mitigate potential future flood damages that would otherwise result in a repeated spillage of raw wastewater of the magnitude observed following Hurricane Sandy. These proposed measures will isolate MCUAEPS structures from surrounding floodwaters and thereby mitigate potential damages for flood events up to a 500-year recurrence interval.

6.0 PERMITS AND PROJECT CONDITIONS

6.1 Permits

The Subgrantee is responsible for obtaining all applicable Federal, State, and local permits and other authorizations prior to construction and must adhere to all permit conditions. All applicable Federal, State and local permits must be applied for prior to project implementation. The following permits are expected to be required (See Appendix M):

- Waterfront Development Permit—NJDEP Division of Land Use
Submitted to Land use Development May 1, 2015. Awaiting Completeness Review.
- Freshwater Wetlands Permit—NJDEP Division of Land Use
Submitted to Land Use Development May 1, 2015. Awaiting Completeness Review.
- Coastal Wetlands Permit—NJDEP Division of Land Use
Submitted to Land Use Development May 1, 2015. Awaiting Completeness Review.
- Flood Hazard Area Permit—NJDEP Division of Land Use
Submitted to Land Use Development May 1, 2015. Awaiting Completeness Review.
- Preconstruction Permit and Operating Certificate-NJDEP Air Quality Permitting Program
Coordinating with NJDEP.
- Treatment Works Approval—NJDEP Division of Water Quality
Submitted to Division of Water Quality May 1, 2015.
- Soil Erosion and Sediment Control Certification and Stormwater Management/Construction Permits-Freehold Soil Conservation District
Submitted to Freehold Soil Conservation District May 1, 2015.
- Township of Woodbridge Planning Board Review
MCUA is exempted from local Planning Board Review process.

6.2 Project Conditions

Any substantive change to the approved scope of work would require re-evaluation by FEMA and the NJEIFP for compliance with NEPA and other laws and executive orders. The Subgrantee shall not initiate construction activities until 15 days after the date that the FONSI has been signed as “APPROVED.” Failure to comply with the following conditions, during project implementation, may jeopardize Federal funding:

1. The perimeter flood wall must be designed at an elevation at or above the 500-year floodplain elevation plus one (1) foot vertical height (23.0 ft.) in accordance with EO 11988, implementing regulations at 44 CFR Part 9 and the National Flood Insurance Program. The best available flood elevation data is available at FEMA’s Region II Coastal Analysis and Mapping webpage: <http://www.region2coastal.com/preliminaryfirms>.
2. Any proposed construction in the floodplain must be coordinated with the local floodplain administrator and must comply with Federal, State, and local floodplain laws and regulations.
3. Excavated soil and waste materials must be managed and disposed of in accordance with applicable Federal, State, and local regulations.

4. In the event that unmarked graves, burials, human remains, or archaeological deposits are uncovered, the Subgrantee and its contractors will immediately halt construction activities in the vicinity of the discovery, secure the site, and take reasonable measures to avoid or minimize harm to the finds. The Subgrantee will inform the New Jersey Office of Emergency Management (Grantee), New Jersey State Historic Preservation Office (NJSHPO) and FEMA immediately. The Subgrantee must secure all archaeological findings and restrict access to the area. Work in sensitive areas may not resume until consultations are completed or until an archaeologist who meets the Secretary of the Interior's Professional Qualification Standards determines the extent and historical significance of the discovery. Work may not resume at or around the delineated archaeological deposit until the Subgrantee is notified by the Grantee to proceed.
5. The Subgrantee must submit to Grantee and FEMA a copy of the wetland mitigation plan for review and comment concurrent with its submission to NJDEP.
6. The Subgrantee must submit copies of all obtained permits to the Grantee/FEMA at or prior to final closeout of the public assistance grant.
7. Occupational Safety and Health Administration (OSHA) standards must be followed during construction to avoid adverse impacts to worker health and safety.
8. It is expected that the Subgrantee and its construction contractor(s) will conduct construction utilizing BPM to limit noise, dust, sedimentation, and erosion during construction.
9. It is recommended that the Subgrantee restore disturbed construction areas of the site with native seed and/or plant species to minimize soil erosion and sedimentation, as well as enhance environmental habitat quality of project site. It is recommended that disturbed soil areas be planted with native plant material, as soon as practicable after exposure, to avoid or minimize growth of undesired and potentially invasive plant species that can potentially take hold without competition of native plant materials. Local landscape plant nurseries and soil conservation offices can assist with identification of suitable native plants for site location type. The following websites may assist in identification of native plant material for the proposed project site:
 - a. <http://plants.usda.gov/java/>
 - b. www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/plants/
 - c. www.fs.fed.us/wildflowers/nativeplantmaterials/rightmaterials.shtml

7.0 PUBLIC INVOLVEMENT

In accordance with NEPA, this EA will be released for a 15-day public review and comment period. Availability of the report for comment will be advertised in The Courier, Home News and Star Ledger newspapers. A hard copy of the report will be available for review at the MCUA's Administration office located at 2571 Main Street Extension, Sayreville, NJ 08872. The office is open weekdays between 9:00 a.m. and 4:00 p.m. An electronic copy of the EA may be requested by emailing FEMA4086COMMENT@fema.dhs.gov. The EA will also be made available for download from the FEMA website at www.fema.gov/resource-documentlibrary. This EA reflects the evaluation and assessment requirements of the Federal government, the decision-maker for the Federal action; however, FEMA will take into consideration any substantive comments received during the public review period to inform the final decision regarding grant approval and project implementation. The public is invited to submit written comments by mail to FEMA Region 2, Office of Environmental Planning & Historic Preservation, 13 Floor, 26 Federal Plaza New York, NY 10278, or email to: FEMA4086COMMENT@fema.dhs.gov.

If no substantive comments are received from the public and/or agency reviewers, the environmental assessment will be adopted as final and a FONSI will be issued by FEMA. Substantive Comments will be addressed as appropriate in the final documents.

8.0 CONCLUSION

This EA concludes that improvements and upgrades, along with the construction of a floodwall for the MCUAEPS avoids, minimizes, and/or mitigates adverse impacts to the environment. In addition, provisions for standby power resiliency will be made to ensure Facility would remain operational during storm events in which outside power is lost. The project will maintain continuous operation of the MCUAEPS as required by regulations, thereby greatly reducing the potential for untreated sewage discharges from the MCUAEPS as a result of equipment failures, power outages, and flooding. It was determined that there were no practical alternatives to relocate the facility outside the 500-year floodplain and that the proposed action of a flood wall, isolation vault, and bypass pumping for the Wastewater Conveyance Facility along with a Riser Ring for the Northwest Access Shaft are the most feasible, cost-effective, and environmentally sound measures for the MCUAEPS. Elevation of essential MCUAEPS components above the 500-year floodplain is impractical and elevation of individual process areas was more resource intensive than the proposed alternative. Other alternatives considered such as wet flood-proofing, relocation, and perimeter flood wall were not technically feasible, not cost-effective, and not permitted in a V-Zone. Mitigation (through restoration) of minimal impacts to wetlands will be undertaken to meet the requirements of the NJ Department of Environmental Protection and the U.S. Fish & Wildlife Service. During the construction phase of this project, short-term impacts to soils, surface water, air quality, and noise will be minimized by utilizing BMPs.

Therefore, this proposed alternative is the best option to mitigate against future storm risk damage to the facility and to ensure continuity of wastewater treatment. This proposed alternative will significantly minimize the potential for economic, public health and environmental damages in the event of storms or power outages. In addition, provisions for standby power resiliency would be made to ensure Facility would remain operational during storm events in which outside power is lost to the Facility.

9.0 LIST OF PREPARERS

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10.0 REFERENCES

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