



Draft Environmental Assessment

**Miller Street, Cross Street and Furnace Avenue Area
Flood Control and Furnace Brook Restoration Project
Quincy, Norfolk County, MA**

HMGP 4051-51

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FEMA

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LIST OF ACRONYMS

APE – Area of Potential Effect
ASAPP - Archaeological Site Avoidance and Protection Plan
CEQ - Council on Environmental Quality
CFR – Code of Federal Regulations
CWA - Clean Water Act
DMF - Division of Marine Fisheries
EO - Executive Order
EPA – Environmental Protection Agency
ESA – Endangered Species Act
FEMA - Federal Emergency Management Agency
FONSI – Finding of No Significant Impact
HMGP - Hazard Mitigation Grant Program
MACRIS - Massachusetts Cultural Resource Information System
MassDEP - Massachusetts Department of Environmental Protection
MEMA - Massachusetts Emergency Management Agency
NEPA - National Environmental Policy Act
NHPA – National Historic Preservation Act
NPDES - National Pollutant Discharge Elimination System
NRHP – National Register of Historic Places
PAL - Public Archaeology Lab, Inc.
SHPO – State Historic Preservation Office
USACE - U.S. Army Corps of Engineers
USFWS - United States Fish and Wildlife Service

1.0 INTRODUCTION

The City of Quincy has applied for a Federal Emergency Management Agency (FEMA) Hazard Mitigation grant through the Hazard Mitigation Grant Program (HMGP) to implement a series of drainage infrastructure improvements and ecological restoration measures to mitigate flooding in a flood prone West Quincy neighborhood. The Miller Street, Cross Street, and Furnace Avenue neighborhood in West Quincy experiences flooding during significant precipitation events due to antiquated drainage infrastructure and a lack of capacity in the closed conduit section of Furnace Brook. The segment of the Brook which flows underground, i.e., the closed conduit section, does not have the capacity to accommodate the volume of stormwater which is directed to it through upstream drainage infrastructure. The topography within and around the neighborhood creates an isolated drainage basin bordered by the Southeast Expressway (Route 93) to the southwest, Copeland Street to the north/northwest, and Furnace Brook Parkway to the east/northeast.

The Massachusetts Emergency Management Agency (MEMA) is the state agency partner for the Proposed Action; MEMA is the grant recipient and the City of Quincy is the grant sub-recipient.

This Environmental Assessment is prepared in accordance with the National Environmental Policy Act (NEPA) and implementing regulations. The purpose of the Environmental Assessment is to analyze potential effects of the Proposed Action and Alternatives on the human environment, and to determine whether the project warrants preparation of an Environmental Impact Statement or a Finding of No Significant Impact (FONSI).

2.0 PURPOSE AND NEED

The purpose of the *Miller Street, Cross Street and Furnace Avenue Area Flood Control and Furnace Brook Restoration Project* is to reduce the magnitude, frequency, and duration of flooding in the low-lying areas of this West Quincy neighborhood. The project is necessary because the Miller Street, Cross Street, and Furnace Avenue neighborhood experiences flooding from stormwater which exceeds the water-carrying capacity of Furnace Brook, which is the only drainage outlet within the watershed, causing repetitive damage to private and public property.

3.0 PROJECT LOCATION AND BACKGROUND

The project area (Appendix A, Figures 1 - 3) is dominated by moderate to dense urban residential and commercial development, with extensive impervious surfaces and minimal undeveloped land. Furnace Brook flows north through the project area within an underground conduit consisting of a concrete box culvert measuring four feet high by eight feet wide and a 60-inch Reinforced Concrete Pipe extending from the Southeast Expressway for approximately 1,500 linear feet to an outlet into an open channel approximately 275-feet north of the Cross Street and Crescent Street intersection. The open channel portion of the project is an approximately 1,900-foot-long segment of Furnace Brook that extends in a linear configuration roughly parallel to Furnace Brook Parkway. The open channel segment consists of approximately 12 acres of undeveloped forested uplands and wetlands situated south of Quarry Street, east of Hall Place and Hall Cemetery, southwest of Furnace Brook Parkway, and northwest of Cross Street. Residential development borders the land to the west, north, and east, and Hall Cemetery is located to the southwest.

The attached Drainage Area Map (Appendix A, Figure 4) depicts four sub-basins within the neighborhood drainage area, all of which direct runoff into a collection system that includes multiple underground connections to the closed conduit section of Furnace Brook. During heavy rain events, the closed conduit section of Furnace Brook lacks the capacity to convey the volume of water from the watershed area, surcharges (i.e. flowing up and into) the collection system resulting in extensive neighborhood flooding. The attached Existing 25-year Flood Delineation figure (Appendix A, Figure 5) depicts the surveyed extent of a 2010 flood event which caused extensive damage to public and private properties within the watershed area. The figure also depicts the anticipated extent of flooding during the modeled 25-year frequency storm event.

4.0 ALTERNATIVES

This section describes the No Action Alternative, the Proposed Action Alternative, and Alternatives That Were Considered and Dismissed. Guidance provided in NEPA and its implementing regulations states that a federal agency must "rigorously explore and objectively evaluate all reasonable alternatives and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their elimination." The scope of alternatives for the Miller Street, Cross Street, and Furnace Avenue neighborhood is limited to the flood-prone neighborhood watershed area itself and discharge into Furnace Brook. Since the stormwater flooding that occurs in the neighborhood ultimately discharges into Furnace Brook, a solution involving a discharge into Furnace Brook was deemed to be the only practicable option for accommodating the stormwater. The Proposed Action was selected by the City to meet the Purpose and Need (Section 2.0) after considering engineering requirements, site constraints, environmental effects and budgetary constraints.

4.1 Alternative 1: No Action Alternative

The No Action Alternative would result in no significant changes to the existing flooding problem in the subject neighborhood. The existing antiquated drainage infrastructure and closed conduit section of the Brook would continue to be ineffective in its capacity to accommodate significant precipitation events. Under the No Action Alternative, the downstream ecological restoration activities would not proceed, and the degraded streams existing characteristics would not be changed.

4.2 Alternative 2: Proposed Action Alternative - Miller St., Cross St. and Furnace Ave. Flood Control and Furnace Brook Restoration

The Proposed Action Alternative consists of drainage infrastructure improvements within the Miller Street, Cross Street, and Furnace Avenue neighborhood watershed area and is designed to mitigate flooding up to the 25-year frequency storm event. The project proposal includes construction of a pump station with a force main at 20 Furnace Avenue. The force main would extend downstream to the open channel section of Furnace Brook and would discharge into a plunge pool and then into Furnace Brook between Cross Street and Reardon Street. The project would also repair deteriorating segments of the Furnace Brook channel walls between Cross Street and Reardon Street and a comprehensive ecological restoration to approximately 900 linear feet of Furnace Brook between Reardon Street and Quarry Street.

Drainage infrastructure improvements in the neighborhood watershed area would replace existing underground drainage pipes, manholes and catch basins (i.e. the stormwater collection system) and install new underground drainage pipes, catch basins and water quality chambers to upgrade the functionality of the system and redirect stormwater from the underground closed conduit section of Furnace Brook to the proposed pump station. New four-foot-deep sump catch basins with a hood on the outlet pipe would be installed throughout the Miller Street, Cross Street and Furnace Avenue neighborhood area. The deep sump catch basins would provide a Total Suspended Solid removal rate of 25% improving the water quality of the storm water.

Two water quality chambers would be installed just upstream of the proposed pump station for each contributing collection system. The proposed water quality units would be sized to treat the stormwater in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. Per the Standards, the required water quality volume equals 1.0 inch of runoff times the total impervious area of the post-development project site for a discharge. The MassDEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices would then be used to ensure the units are sized to handle the anticipated stormwater flows.

The proposed 80 foot long x 30 foot wide pump station building would be constructed at 20 Furnace Avenue, along with the connecting segment of the 48-inch force main which would extend downstream from the pump station to the open channel section of Furnace Brook. The pump station would extend approximately 15 feet below ground and be

approximately 33 feet tall with respect to existing grade. The pump station would be equipped with flood-proofing measures to reduce the potential for damage. The Pump Station would be an enclosed building that houses two screw pumps, pump motors, electrical equipment, instrumentation and controls, air monitoring, and heating and ventilation equipment. The finished floor elevation of the pump station and transformer/generator pad have been designed at an elevation one foot (minimum) above the 500-year flood elevation of 55.63 feet (City of Quincy Base). The pump station would include a standby generator for power outages and consist of two pumps, which would allow for one to be operational during maintenance activities. The number of pumps would allow for a set of backup pumps during full operation. The pump station would be equipped with high water level and emergency alarms that would be monitored and controlled remotely by the City of Quincy Department of Public Works.

The pump station construction would result in 2,450 square feet of permanent wetland disturbance and 850 square feet of temporary wetland disturbance. The temporary wetland disturbance would be restored in place while the permanent disturbance is mitigated by a 2,450 square foot Wetland Replication Area. A bioretention basin and rip-rap diaphragm for water quality and retreatment, respectively, is proposed at the pump station site to treat the new proposed impervious areas.

The force main extending from the pump station would discharge to a plunge pool lined with 12-inch rip-rap to slow stormwater discharge from the outlet. The plunge pool would be located approximately 250 feet north of the intersection of Cross Street and Furnace Brook Parkway. From the plunge pool, the stormwater would flow into the adjacent open channel section of Furnace Brook.

The Proposed Action would repair approximately 200 linear feet of granite block wall along Furnace Brook between Cross Street and Reardon Street. This work would consist of repairing sections of the wall that have collapsed into the stream by removing the granite blocks and re-setting them in the wall. Additional blocks from the 80-foot-long segment of wall that would be removed for the force main connection would be available materials if needed.

The Proposed Action includes ecological restoration on an approximately 900-foot long segment of Furnace Brook between Reardon Street and Quarry Street. The ecological restoration of Furnace Brook is designed to convert the existing linear, manmade stream channel to a sinuous watercourse with sloped earthen embankments providing additional flood storage and a diverse native plant community.

The proposed project was not designed for larger storm events because the increase in costs associated with designing and constructing for larger storm events would be cost prohibitive and are not practicable as noted above in the Alternatives Analysis. Furthermore, downstream portions of Furnace Brook would be unable to handle the increase in flows that would result if the project was designed to accommodate larger storm events.

4.3 Alternatives Considered and Dismissed

The following sections 4.3.1 – 4.3.3 address alternatives considered and dismissed to the drainage improvements, i.e., the new drainage infrastructure, pump station, and force main. The following sections 4.3.4 -4.3.5 address alternatives considered and dismissed to the ecological restoration portion of the project.

4.3.1 Dismissed Alternative 1

Redirect or pump flood waters to other watersheds or waterways. This alternative was ruled out due to construction costs and/or existing flood capacities in adjacent watersheds.

4.3.2 Dismissed Alternative 2

Remove privately-owned structures from within the flood-prone area to eliminate potential future damage to property. This alternative was determined to be cost prohibitive because of the combined costs incurred by the city because of the need to purchase and demolish an extensive number of privately-owned residential and commercial structures in the flood-prone area.

4.3.3 Dismissed Alternative 3

Construction of an underground stormwater detention system and pump station with associated infrastructure improvements and a force main discharging into Furnace Brook at a reduced rate. The underground stormwater detention system creates significant complications because of the cost to construct and because of the lack city owned land within the drainage basin that could accommodate such a large system. This alternative was deemed impractical and cost prohibitive.

4.3.4 Dismissed Alternative 4

Repair sections of the existing vertical granite walls without any stream restoration. This alternative would result in very minor improvements to flow within the stream from the removal of the fallen stones in the stream bed. The stream would continue to flow in the existing linear channel, rapidly conveying stormwater downstream and contributing to flooding issues downstream. This alternative was dismissed as it would have limited improvement to flood storage capacity and ecological health and function of the stream and floodplain.

4.3.5 Dismissed Alternative 5

Remove the existing vertical stone wall and earthen berms and restore the embankments of the existing channel with new slopes between Cross Street and Quarry Street. This option was dismissed because the linear configuration of the channel would remain, and the floodwaters would continue to quickly pass through the area at the current velocity without any significant improvement to the flood storage capacity or ecological health and function of the stream and floodplain.

4.4 Effect Evaluation

Effects include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if the agency believes that the overall effect would be beneficial (40 CFR 1508.8).

When possible, this Environmental Assessment uses quantitative information to evaluate potential effects; otherwise, the potential qualitative effects are evaluated based on the criteria listed in Table 4.0.1:

Table 4.0.1: Effect Significance and Context Evaluation Criteria for Potential Effects

Effect Scale	Criteria
None/Negligible	The resource area would not be affected, OR effects would either be non-detectable or, if detected, would be slight and local. Effects would be well below regulatory standards, as applicable.
Minor	Effects to the resource, both adverse and beneficial, would be measurable, but the effects would be small and localized. Adverse effects would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Effects to the resource, both adverse and beneficial, would be measurable and would be localized or of regional scale. Adverse effects would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary to reduce any potential adverse effects.
Major	Effects to the resource, both adverse and beneficial, would be readily measurable and would have substantial consequences on a local or regional level. Adverse effects would exceed regulatory standards and mitigation measures to offset the adverse effects would be required to reduce effects. Long-term changes to the resource would be expected.

Table 4.0.2 lists resources that do not require effect analysis with the reasoning behind elimination.

Table 4.0.2: Effect Sections Eliminated from Review.

Topic	Reason
Wild and Scenic Rivers Act	The project area is not near a wild and scenic river or scenic byway or highway.
Physical Resources: Air Quality	Temporary emissions from construction activities would be the only disturbance.
Water Resources: Safe Drinking Water Act	No sole source aquifer or other drinking water source within 1,000 feet of project area.
Coastal Resources	The project area is not located in a Coastal Zone
Biological Resources Wildlife and Fish – Magnuson-Stevens Fishery Conservation and Management Act	Project area is neither within nor affects Essential Fish Habitat.
Biological Resources Wildlife and Fish – Bald and Golden Eagle Protection Act	Project area is not located near a Bald Eagle nest. Golden Eagle is not found in New England states.
Socioeconomic Resources – Land Use and Planning	Project area is protected open space/parklands and would remain protected. Pump station would be constructed on a city-owned parcel intended for the proposed use or similar.
Socioeconomic Resources – Noise	Pumping system and brook restoration would have no effect on noise.
Socioeconomic Resources - Transportation	Negligible disturbance from temporary road closures during construction.
Socioeconomic Resources – Hazardous Materials	No known hazardous materials or potential hazard to human health associated with project sites.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL EFFECTS

5.1 PHYSICAL RESOURCES

5.1.1 Geology and Soils

5.1.1.1 Existing Conditions

The dense commercial and residential development in this urban area has been in existence for over 50 years, according to historic aerial photography, and soils in this area are dominated by urban fill material and disturbed soil conditions.

The Miller Street, Cross Street, and Furnace Avenue neighborhood is mapped as Urban Land while the stream restoration area is mapped as Freetown Muck by the Natural Resource Conservation Service Soil Survey (Appendix A, Figure 3). Underlying glacial material in the project area is mapped as sandy material based on the MassGIS Surficial Geology data layer (Appendix A, Figure 4). It is likely that the sandy deposits are associated with glacial outwash material within the original footprint of Furnace Brook prior to urban development.

5.1.1.2 Potential Effects and Proposed Mitigation

Alternative 1 – No Action

Under the No Action Alternative, the existing degraded soil conditions adjacent to Furnace Brook would remain intact. These urban soils provide minimal ecological value and typically host extensive invasive species. Effects would be **minor**.

Alternative 2 – Proposed Action

The Proposed Action Alternative would result in excavation and removal of soils within the stream restoration project footprint to facilitate re-grading and importing new, organic rich topsoil. The sinuous configuration of the proposed stream would decrease water velocity within the channel and reduce soil erosion and sediment transport and would allow sediment to settle from stormwaters.

The soil in the Miller Street, Cross Street, and Furnace Avenue neighborhood would not be significantly changed by the project with the exception of the improvement associated with importing clean organic rich topsoil for construction of the Wetland Replication Area at 20 Furnace Ave. and excavation for the construction of the proposed pump station (approx. 240 square feet). Temporary excavation activities associated with all other aspects of the project in the neighborhood would require temporary stockpiling soil and backfilling as necessary.

Soil conditions in the vicinity of the Furnace Brook Restoration portion of the project would be significantly improved by importing a large volume of clean, organic rich topsoil to restore stream corridor. These soils would replace the existing urban fill material and disturbed conditions which currently exist along the stream. As mitigation, the project would use Best Management Practices such as erosion and sedimentation control devices including silt-fencing, erosion control matting and coir fiber logs that would reduce or prevent erosion during and post-construction.

The effects to soils are expected to be **minor** and overall would result in an overall improvement to soil quality and stability.

5.2 WATER RESOURCES

5.2.1 Water Quality

The Clean Water Act (CWA) regulates discharge of pollutants into water with sections falling under the jurisdiction of the U.S Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA). Section 404 of the CWA establishes the USACE permit requirements for discharge of dredged or fill materials into Waters of the United States and traditional navigable waterways. USACE regulation of activities within navigable waters is also authorized under the 1899 Rivers and Harbors Act. The EPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff under Section 402 of the CWA which authorizes the National Pollutant Discharge Elimination System (NPDES). Activities that disturb one acre of ground or more require a NPDES permit, issued through the EPA. A Section 401 water quality certification is required when obtaining a CWA Section 402 or 404 Permit.

5.2.1.1 Existing Conditions

The primary water resource associated with the project is Furnace Brook, an urban perennial stream with documented water quality concerns associated with stormwater runoff and associated pollutants. Furnace Brook flows northerly beneath Route 93 and through the Miller Street, Cross Street, and Furnace Avenue neighborhood within an underground concrete lined 4-foot-high by 8-foot-wide box culvert. The box culvert, referred to herein as the closed conduit section, extends from the Route 93 for approximately 1,500 linear feet to an outlet into an open channel approximately 275 feet north of the intersection between Cross Street and Crescent Street. The neighborhood watershed area above the closed conduit section contains an antiquated drainage system which directs untreated runoff into a collection system that includes multiple underground connections to the closed conduit section of Furnace Brook. The open channel section of Furnace Brook is located downgradient of the closed conduit and therefore is subject to inundation, sedimentation, and pollution from stormwater in the upgradient drainage area. Furnace Brook ultimately discharges into an estuary known as Black's Creek, and into Quincy Bay. The existing condition promotes discharge of untreated stormwater into Furnace Brook, negatively affecting water quality.

5.2.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the existing discharge of untreated urban runoff into Furnace Brook would continue to contribute to poor water quality in the Brook and downstream resources. Effects would be **minor**.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, the stormwater from the neighborhood drainage area into Furnace Brook would be directed into a new drainage system, and then to the pump station, force main and plunge pool, bypassing the closed conduit section of Furnace Brook. The new system would provide treatment through new catch basins with 4-foot deep sumps and hood on the outlet pipe and water quality units sized to remove 80% Total Suspended Solids. The proposed water quality units would be sized to treat the stormwater in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. Per the Standards, the required water quality volume equals 1.0 inch of runoff times the total impervious area of the post-development project site for a discharge. The MassDEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices would then be used to ensure the units are sized to handle the anticipated stormwater flows.

The proposed pump station would regulate flow into Furnace Brook which would improve upon the existing “flashy” nature of discharge (i.e., large volumes of stormwater rapidly entering the stream and passing through at high velocity in response to storm events) into the river which causes erosion and promotes discharge of sediment and other pollutants in stormwater downstream. The new catch basins and water quality units would remove suspended solids and other pollutants, providing a significant improvement as compared to existing conditions. In addition, once the water enters the stream, it would pass through the new restored channel with a sinuous water course which would further reduce velocity, accommodate floodwater, and promote sediment removal. These changes are anticipated to result in an overall improvement to water quality in Furnace Brook. Effects would be **minor**.

5.2.2 Floodplains

Executive Order (EO) 11988 Floodplain Management requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Each federal agency shall provide leadership and shall 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 in carrying out its responsibilities. FEMA uses the 8-Step decision-making process to evaluate potential effects on and mitigate effects to floodplains in compliance with EO 11988 and 44 CFR Part 9. The Department of Conservation and Recreation Flood Hazard Management Program administers and regulates floodplains in Massachusetts in accordance with the National Flood Insurance Act and the National Flood Insurance Program.

5.2.2.1 Existing Conditions

According to the July 17, 2012 FEMA Flood Insurance Rate Map for Norfolk County (Community Panel 25021 C 0207E) (Appendix A, Figure 3), the property at 20 Furnace Avenue and portions of the Miller Street, Furnace Avenue and Cross Street neighborhood is mapped within Zone AE (el. 49) – *Special flood areas subject to inundation by the 1% annual chance flood – Base flood elevations determined*. The open channel segment of Furnace Brook and adjacent land is also mapped as Zone AE (el 38-42) and contains a regulatory floodway.

The neighborhood watershed area is dominated by moderate to dense urban residential and commercial development, with extensive impervious surfaces and minimal undeveloped land. The Drainage Area Map (Appendix A, Figure 5) depicts four sub-basins within the drainage area, all of which direct runoff into an antiquated urban stormwater collection system that includes multiple underground connections to Furnace Brook. During heavy rain events, this

section of Furnace Brook, which flows underground, lacks the capacity to convey the volume of stormwater from the watershed area, resulting in the surcharge of the collection system and extensive neighborhood flooding.

The downstream open channel section of Furnace Brook is a linear channel with minimal flood storage and attenuation capacity. In general, stormwater moves through the open channel at a high volume and velocity exacerbating downstream flooding issues.

5.2.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the existing conditions would persist, and the neighborhood's residents and infrastructure would remain at risk of floods. The antiquated stormwater system would continue to lack the capacity to convey stormwater through the watershed and the open channel section of Furnace Brook would continue to have minimal flood storage and attenuation capacity. Effects would be **minor**.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, the project has been designed to protect the project area from flooding up to the 25-year, 24-hour storm event. Precipitation beyond the 25-year storm event would continue to result in potential flooding; however, the magnitude and extent of flooding would be reduced because of the added flood storage and attenuation capacity within the watershed. The project would result in a decrease in base discharge and the Town has submitted a request for a Conditional Letter of Map Revision demonstrating "no-rise" of the Base Flood Elevation anywhere within the community for work in the regulatory floodway (Appendix C).

Potential short- and long-term adverse impacts would be avoided and minimized through the special conditions attached to a permit for work within a floodplain, the creation of new flood storage capacity and attenuation within the watershed and protecting the new pump station up to the 500-year storm event. The finished floor elevation of the pump station and transformer/generator pad have been set at an elevation of one foot (minimum) above the 500-year flood elevation of 55.63 feet.

The project would result in an overall improvement to the floodplain by reducing the likelihood of flood damage and providing ecological restoration of Furnace Brook. Effects would be **minor**.

5.2.3 Wetlands

Executive Order (EO) 11990 Protection of Wetlands requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Each federal agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. FEMA uses the 8-step decision-making process to evaluate potential effects on, and mitigate effects to, wetlands in compliance with EO 11990 and 44 CFR Part 9. The MassDEP and Quincy Conservation Commission administer and regulate wetlands under the *Massachusetts Wetlands Protection Act* and its implementing regulations and/or the *City of Quincy Wetlands Protection Ordinance*.

5.2.3.1 Existing Conditions

The property at 20 Furnace Avenue contains a small wetland characterized as a non-bordering, Isolated Vegetated Wetland, located primarily within the eastern half of the property. The Furnace Brook closed conduit extends above ground within a 60-inch reinforced concrete pipe along the northern property line and along the edge of the wetland; however, there is no direct hydrological connection between the wetland and the closed conduit. A dirt/gravel parking area extends easterly from Furnace Avenue while a fringing forested upland occurs between the parking area and the Isolated Vegetative Wetland.

The open channel section of Furnace Brook contains a forested wetland system regulated in Massachusetts as a Bordering Vegetated Wetland and functions as a flood storage basin for Furnace Brook during flooding events. Evidence of surficial flow (e.g. scouring) to and from the stream was observed in the field. Along with stormwater from the adjacent uplands and the Brook, shallow groundwater appears to contribute to wetland hydrology within the wetland.

Wetlands were field delineated prior to permitting and the wetland landscape on this property is impacted by man-made disturbance including invasive species, historic fill, construction debris, and solid waste.

5.2.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the existing wetlands would remain undisturbed and in their current condition. Effects would be **minor**.

Alternative 2: Proposed Action

The Proposed Action Alternative would create new wetlands along Furnace Brook and mitigate wetland disturbances associated with the pump station, through creation of a Wetland Replication Area and restoration of temporarily disturbed wetlands. The pump station construction would result in 2,450 square feet of permanent wetland disturbance and 850 square feet of temporary wetland disturbance. The temporary wetland disturbance would be restored in place while the permanent disturbance is mitigated by a 2,450 square foot Wetland Replication Area. A bioretention basin and rip-rap diaphragm for water quality and retreatment, respectively, is proposed at the pump station site to treat the new proposed impervious areas (Appendix C).

The ecological restoration of Furnace Brook would create a sinuous channel with gently sloping embankments that would become wetlands along the river. This would include importing wetland soils and planting wetland indicator species along the river to restore a natural riparian corridor in place of the existing linear channel which lacks a bordering wetland system adjacent to the project.

Effects from the Proposed Action Alternative would be **moderate** but result in an overall improvement to wetlands

5.3 BIOLOGICAL RESOURCES

5.3.1 Wildlife and Fish

5.3.1.1 Existing Conditions

Terrestrial

Terrestrial wildlife habitat is severely limited by the extensive urban development within the project area and the profusion of degraded habitat in undeveloped areas along Furnace Brook. The Miller Street, Furnace Avenue and Cross Street neighborhood is a densely developed urban neighborhood with only scattered patches of vegetation. The wetland located on the 20 Furnace Avenue property lacks any important wildlife habitat characteristics due to its fragmented location, essentially surrounded by development, and the extensive understory coverage by invasive common reed.

The project location and other upland areas in the vicinity may provide foraging, nesting, breeding, and migratory habitat for common suburban habitat generalists adapted to thriving in developed landscapes such as eastern coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), and deer mice (*Peromyscus* spp.), in addition to various avian species (songbirds, raptors, wild turkey, etc.) and reptiles such as garter snakes (*Thamnophis sirtalis*).

Aquatic

Potential aquatic wildlife habitat is also limited by the densely developed urban setting. The relatively shallow depths, poor water quality, and linear configuration of Furnace Brook significantly restrict fish habitat. In addition, the upgradient and downgradient segments of Furnace Brook extend through underground conduits for hundreds of feet. Furnace Brook in general provides spawning and nursery habitat for rainbow smelt (*Osmerus mordax*) and American eel (*Anguilla rostrata*); the project area may support American eel but is upstream of suitable smelt spawning habitat (DMF, 2016).

5.3.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the poor-quality terrestrial and aquatic wildlife habitat conditions would persist. Effects would be **minor**.

Alternative 2: Proposed Alternative

The Proposed Project Alternative is expected to result in modest wildlife habitat improvements, primarily within the stream restoration area. Reconfiguration of the stream and restoring native vegetation within the riparian corridor would improve the physical, chemical, and biological characteristics of the wildlife habitat along the stream. Native vegetation would provide shelter and food for wildlife and support pollinators, while attracting a variety of birds, butterflies, and other wildlife by providing diverse habitats and food sources. The project is not expected to block avian migratory paths, remove breeding grounds, or negatively affect avian habitats.

The organic rich soil proposed along the restored stream channel would provide habitat and a food source for a variety of smaller small mammals, insects, worms, etc. that would help diversify the lower levels of the food chain and support the higher levels of the food chain.

Aquatic habitat would also be improved as a result of the stream restoration activities which would replace degraded existing conditions (i.e. the linear channel with vertical stone walls) with a sinuous channel and naturally vegetated embankments establishing habitat suitable for shelter, shade and foraging. In accordance with DMF's recommendation, the project would be subject to a Time-of-Year construction restriction for any in-water silt producing work from March 15 - June 30 for the protection of American eel (DMF, 2016).

Effects would be **minor**.

5.3.1 Vegetation

5.3.1.1 Existing Conditions

Natural plant communities are not present within the project area because of the extensive urban development within and adjacent to the site. The landscape is generally disturbed, and even in locations where a mature canopy has become established, and invasive species are commonplace. The upland canopy at 20 Furnace Avenue and vicinity is dominated by Norway maple (*Acer platanoides*), with the understory comprised of multiflora rose (*Rosa multiflora*), staghorn sumac (*Rhus typhina*), common buckthorn (*Rhamnus cathartica*), Japanese knotweed (*Fallopia japonica*), and Asiatic bittersweet (*Celastrus orbiculata*). The groundcover consists of various species of goldenrod (*Solidago* spp.), ragweed (*Ambrosia* spp.), and poison ivy (*Toxicodendron radicans*). All of the preceding plants are non-native invasive species, with the exception of staghorn sumac, goldenrod, and poison ivy.

The upland along Furnace Brook is defined by a canopy layer of red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), black cherry (*Prunus serotina*), American elm (*Ulmus americana*), northern red oak (*Quercus rubra*), white oak (*Quercus alba*), and non-native invasive Norway maple (*Acer platanoides*). The understory includes saplings from the canopy layer and a shrub layer dominated by non-native invasive multiflora rose, Asiatic bittersweet,

and Japanese knotweed. The groundcover is generally sparse, consisting of raspberry (*Rubus* spp.) and seedlings from the overstory.

Vegetation within the wetlands at 20 Furnace Avenue and in the immediate vicinity of Furnace Brook is comprised of several mature willow (*Salix* spp.) trees with scattered American elm (*Ulmus Americana*) and red maple (*Acer rubrum*). Invasive common reed (*Phragmites* spp.) dominates the wetland understory. Vegetation within the forested Bordering Vegetative Wetland consists of a moderately dense canopy layer of red maple, willow, Norway maple, and American elm. The understory consists of a shrub layer of silky dogwood (*Cornus amomum*), Japanese knotweed (*Fallopia japonica*), northern arrowwood (*Viburnum dentatum*), Asiatic bittersweet, common buckthorn, and saplings from the canopy layer. Groundcover consists of soft rush (*Juncus effusus*), raspberry, garlic mustard (*Alliaria petiolate*), and various goldenrods.

5.3.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the existing plant community would remain dominated by invasive species and would continue to be of limited value for wildlife habitat. Effects would be **minor**.

Alternative 2: Proposed Action

Executive Order 13112, Invasive Species, requires federal agencies, to the extent practicable, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health effects that invasive species cause. The Proposed Action Alternative would remove the understory dominated by invasive species and restore a native plant community in the riparian zone along Furnace Brook. Additionally, the wetland replication area and wetland restoration areas would both be established with native species, replacing wetland plant communities dominated by non-native invasive species. Once established, the vegetation in the project area would support a greater diversity and number of native species. Effects would be **minor**.

5.3.2 Threatened and Endangered Species

The Endangered Species Act (ESA) provides for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead Federal agencies for implementing the ESA are the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service. The law requires Federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a “taking” of any listed species of endangered fish or wildlife. “Take” is defined in regulation (50 CFR 10.12) as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.

5.3.2.1 Existing Conditions

The only protected species associated with the project site is the northern long-eared bat (*Myotis septentrionalis*). The Massachusetts Natural Heritage and Endangered Species Program northern long-eared bat Locator Website identified the closest hibernacula in the Town of Wellesley, MA. While the project area is not mapped as being in proximity to hibernacula, existing mature trees on the project site may provide potential roosting and pupping sites for the northern long-eared bat (NHESP, 2020). Numerous mature trees are found throughout the project site, with the largest concentrations located in the vicinity of the wetland at 20 Furnace Avenue and along the open channel segment of Furnace Brook.

5.3.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the action would not occur and there would be no tree removal that could potentially affect northern long-eared bat. Effects would be **none**.

Alternative 2: Proposed Action

The Proposed Action would remove mature trees in the project area which may affect, but not adversely affect northern long-eared bat. Potential habitat would be removed, but the northern long-eared bat is not currently limited by habitat loss; it is limited by the spread of White Nose Syndrome while overwintering in hibernacula (USFWS 2016).

On June 1, 2020, FEMA initiated section 7 consultation under the ESA with USFWS using the streamlined consultation framework that is part of the USFWS's 2016, Biological Opinion on the final 4(d) Rule for the northern long-eared bat. As part of the consultation framework, FEMA was able to imply USFWS concurrence with the "not likely to adversely affect" determination after 30 days of no response. The 30-day period ended July 1, 2020 and FEMA has assumed USFWS concurrence which concludes FEMA's responsibilities under ESA Section 7(a)(2) (USFWS 2020). Effects would be **minor**.

5.4 CULTURAL RESOURCES

Federal agencies must consider the potential effects of their actions upon cultural resources prior to engaging in any undertaking. Cultural resources are defined as prehistoric and historic sites, structures, districts, buildings, objects, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Section 106 of the National Historic Preservation Act (NHPA) codifies this obligation and is implemented by regulation in 36 CFR Part 800. The NHPA 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. While the definition of a cultural resource under NEPA can be broader, FEMA regularly uses Section 106 to meet its obligations to consider effects to cultural resources. For this project, FEMA determined that it was appropriate to utilize its NHPA review to fulfill its NEPA obligations.

Cultural resources determined to be potentially significant under NHPA are subject to a higher level of review and federal agencies must consider the effects of their projects on those resources and consider steps to avoid, minimize, or mitigate those effects. To be considered significant, a cultural resource must meet one or more of the criteria established by the National Park Service (NPS) that would make that resource eligible for inclusion in the NRHP. The term "eligible for inclusion in the NRHP" includes all properties that meet the NRHP listing criteria, which are specified in the Department of Interior regulations Title 36, Part 60.4 and NRHP Bulletin 15. Properties and sites that have not been evaluated at the time of the undertaking may be considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

5.4.1 Identification of APE, Cultural Resources, and Consultation Process

Pursuant to regulation, the Area of Potential Effects (APE) is defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.4 and 800.16). The APE is based upon the "potential" for effect, which may differ for aboveground resources (e.g. historic structures and landscapes) and subsurface resources (archaeological sites). Factors with potential to cause effects, indirect and cumulative, include but are not limited to: noise, vibration, visual (setting), traffic, atmosphere and construction.

The APE for the Proposed Action was determined to include two broad but contiguous areas of work: the areas where drainage system improvements would be undertaken within the Miller Street, Furnace Avenue and Cross Street

neighborhood, and areas along Furnace Brook where stream restoration activities will be undertaken, including staging areas (Appendix A, Figure 6).

The Massachusetts State Historic Preservation Office (SHPO) maintains a database of cultural resources called the Massachusetts Cultural Resource Information System (MACRIS), which includes both standing structures and objects as well as archaeological sites. A search of this database was conducted in July 2020. MACRIS identified two (2) NRHP-listed historic properties and three (3) inventoried resources within the APE; the three “inventoried” resources had not previously been formally evaluated for inclusion in the NRHP:

Table 5.0.1: MACRIS Results for Resources Within APE

Designation	ID	Resource Name	Resource Address
NRHP	04000248	Furnace Brook Parkway	Furnace Brook Parkway
MA Inventory	QUI.464	Daniel Hayes House	Cross Street
NRHP	QUI.931	John Winthrop Jr. Iron Furnace	Crescent Street
MA Inventory	QUI.804	Hall Place Cemetery	Crescent Street
MA Inventory	QUI.805	St. Mary’s Cemetery	115 Crescent Street

5.4.2 Historic (Standing) Structures

5.4.2.1 Existing Conditions

Furnace Brook Parkway and the John Winthrop Jr. Iron Furnace, already listed on the NRHP, were affirmed to retain their historic status. FEMA did not have consent from the property owner to publish the address of the Daniel Hayes House, but FEMA determined that it was not eligible for inclusion in the NRHP due to significant, historically incompatible alterations. Similarly, Hall Place Cemetery and St. Mary’s Cemetery were determined to be not eligible for inclusion in the NRHP due to lack of demonstrable historic significance.

The Furnace Brook Channel Walls, constructed between 1933-1940, were not included in the Massachusetts inventory. Therefore, these structures were researched and assessed for eligibility for inclusion in the NRHP. The channel walls were constructed as part of various New Deal programs, a series of government work programs which included public works projects, reforms, and regulations designed with the intent to bolster the economy and rebuild public confidence during the Great Depression of the 1930s. The walls were also constructed of locally quarried Quincy granite, once famous worldwide for its fine quality as a building material, and the main driver of the local economy from the mid-19th to mid-20th centuries. Although associated with both New Deal construction and the historically important granite quarrying industry, FEMA determined that the retaining walls channeling Furnace Brook at this location were not eligible for listing: better examples of projects associated with the New Deal survive within the City today, including those which showcase the use of Quincy granite in a more exemplary manner.

One additional standing structure within the APE was identified to be greater than 50 years of age and not previously recorded within the Massachusetts inventory. FEMA does not have consent from the property owner to release the address, but this structure located on Quarry Avenue and is a single-family residence reportedly constructed circa 1960. This property was assessed and determined not eligible for inclusion in the National Register of Historic Places based on a lack of demonstrable historic significance.

5.4.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative there is a low but slight chance that historic properties within the vicinity could be affected by poor drainage and minor flooding of Furnace Brook. Effects would be **minor**.

Alternative 2: Proposed Action

The Proposed Action Alternative would have no direct effect on the Furnace Brook Parkway, and the indirect effects, primarily to the visual setting of the Parkway, would be minimal to none, citing lack of historic connection between the channelized Brook and the design of the Parkway. The Parkway design, completed in 1916, predates the channelization of the Brook and the restoration of Furnace Brook may partially restore the more natural landscape originally intended along the Parkway. Additionally, the drainage improvements and proposed landscaping work (e.g. addition of new manholes, riprap, crushed stone path, modest park furniture, wooden guardrail) would not have a significant visual impact upon the Furnace Brook Parkway. The other historic property identified within the APE, the John Winthrop Jr. Iron Furnace, is more appropriately considered an archaeological property. However, as this property lies outside the limit of work for the Proposed Action, there would be no potential for direct or indirect effects to this property so long as it is avoided during construction.

In a consultation letter to Massachusetts SHPO dated July 22, 2020, FEMA presented its conclusion that the Proposed Action would have “No Adverse Effect” on historic properties. FEMA anticipates receiving concurrence from the SHPO on or around August 22, 2020. Effects would be **minor**.

5.4.3 Archaeological Resources

5.4.3.1 Existing Conditions

FEMA conducted a review of MACRIS to determine archaeological sensitivity within the vicinity of the APE and identified one historic archaeological site: a large concentration of quarry industry-related archaeological sites within one mile of the APE, and at least four known pre-contact sites within one mile of the APE.

Based on the review of MACRIS Maps, previous surveys, soils data, and photographs of existing conditions, FEMA determined the APE to be potentially sensitive for archaeological resources, especially given proximity to the freshwater stream and known extensive historical use and occupation of Furnace Brook. In consideration of these factors, FEMA recommended that the City of Quincy retain the services of a qualified professional archaeological consultant to conduct a Phase IA Archaeological Survey within the project APE. FEMA communicated its recommendation in a consultation letter to Massachusetts SHPO dated July 3, 2019 and the SHPO concurred with FEMA’s recommendation and the Phase IA Archaeological Survey was conducted.

The Public Archaeology Lab, Inc. (PAL) was hired by the City to perform the Phase IA Archaeological Survey. PAL produced a report dated March 2020 which described its methodology and presented its research and conclusions. Areas of low, moderate, and high archaeological sensitivity were assigned to the APE based on their research, analysis, and field survey.

PAL’s analysis concluded that most of the APE within the Furnace Brook channel, floodplain, adjacent upland areas along Furnace Brook Parkway and the residential properties were assigned a “low archaeological sensitivity.” No further archaeological investigations were recommended for these low sensitivity areas where significant archaeological resources are not expected.

“Moderate sensitivity” was assigned to the narrow strip of land within and adjacent to the Furnace Brook floodplain between the stone-lined brook channel and the St. Mary’s Cemetery property. Although unlikely, the potential for unmarked burials cannot be discounted, particularly in the platted grave lots that pre-date the early twentieth-century establishment of the City of Quincy–St. Mary’s Cemetery property line south of Reardon Street to the edge of the brook channel.

In order to protect the resources, exact locations are not listed here, but “High sensitivity” areas identified in the PAL report are outside of the limits of work for the Proposed Action Alternative.

5.4.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative there is a negligible chance that archaeological resources within the vicinity could be affected by poor drainage and minor flooding of Furnace Brook. Effects would be **negligible**.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, no ground disturbing activities would occur in the limited “high sensitivity” area of the APE. Furthermore, there is very limited potential for archaeological resources within the APE. However, to account for that very limited potential, FEMA would condition the project to require the City of Quincy to hire a qualified archaeological consultant to develop an Archaeological Site Avoidance and Protection Plan (ASAPP) to avoid any inadvertent ground disturbances (e.g., equipment access along Furnace Brook, tree removal) along the west bank of Furnace Brook south of Reardon Street (in the vicinity of Hall Cemetery), as well as in the vicinity of the John Winthrop Jr. Iron Furnace Site. As part of the ASAPP, the Project Plans would be updated to show the areas of avoidance and photographic documentation required. The photographic documentation of the ASAPP protocols in place/practice before and during construction shall be taken and submitted to FEMA for review.

Effects would be **minor**, but conditional upon the terms of the ASAPP.

5.5 SOCIOECONOMIC RESOURCES

5.5.1 Public Services and Utilities

5.5.1.1 Existing Conditions

Existing utilities in the project area include electrical, water, gas, telecom, and sewer, along with underground drainage systems. These utilities are located primarily within the city street layouts with connections to private properties throughout.

5.5.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, all existing utilities remain in their current condition. The stormwater drainage system would continue to be overwhelmed and cause flooding to the neighborhood at its current rate. There would be no additional demand for utilities in the area. Effects would be **negligible to minor**.

Alternative 2: Proposed Action

The Proposed Action Alternative is designed to protect public utilities not a part of the stormwater drainage system through survey to determine locations avoid during construction activities. The primary purpose of the Proposed Action Alternative is to update and increase capacity of the stormwater collection and drainage system up to the 25-year event. The area is built out and there would not be any additional demand placed on any of the utility systems in the neighborhood. Effects would be **minor**,

5.5.2 Public Health and Safety

5.5.2.1 Existing Conditions

Municipal police, fire, and Emergency Medical Services are located in close proximity to the project area, including the Quincy police station located 3 miles away, and Copeland Street fire station located 0.3 miles away.

5.5.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, no changes to public health and safety conditions and services would occur. There would be no additional hazards from flooding or reductions in levels of emergency services and response times, but flooding would continue in the neighborhood, at its current rate, putting lives and property at risk. Effects would be **negligible**.

Alternative 2: Proposed Action

The Proposed Action Alternative would improve public health and safety conditions and may reduce response times for services during rain events. Hazards from flooding up to the 25-year event would be reduced. Response times from emergency services may be reduced, but other factors other than reduced flooding could impact response times.

Any construction-related road closures from the Proposed Action Alternative would involve notification to the police and fire department with police details provided, as necessary. Heavy equipment staging areas would be located in areas that would not block or impede emergency services. Effects would be **minor**.

5.5.1 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each Federal agency to identify and address, as appropriate, "disproportionately high and adverse human health or environmental effects" its activities may have on minority or low-income populations. Guidance released by the Council on Environmental Quality following publication of the EO makes clear that environmental effects include economic and social effects when considering Environmental Justice during the NEPA process (CEQ 1997).

The CEQ guidance also provides criteria for identifying minority and low-income populations. Specifically, low-income populations are identified based on the annual statistical poverty income thresholds of the U.S. Census Bureau, and minority populations are defined as persons in the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Any area where the minority and/or low-income population exceeds 50 percent is considered to have an environmental justice population, based on the CEQ guidance.

5.5.1.1 Existing Conditions

According to 2010 Census data, the neighborhood in the vicinity of the project area (including a 0.5-mile buffer) has a population of 8,158 people. 24 percent of the population is a low-income group which is identical to the 24 percent Massachusetts state average. The neighborhood is 66 percent white and 34 percent minority: 14 percent Asian, 9 percent black, 6 percent Hispanic and 5 percent identifying as other and/or more than one. While the project area contains minority and low-income groups, both the minority and low-income populations are below the 50 percent threshold to be identified as an Environmental Justice Population (EPA 2020).

5.5.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no Federal action and conditions in the project area would remain unchanged. The community, including minority and low-income populations, would continue to face risk of damage

to property and infrastructure and threats to human life and safety during flood events. Based on these factors, the No Action Alternative would have a **negligible** effect to the community.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, the community, including minority and low-income populations would experience localized and short-term effects during construction (e.g., noise, traffic, and local access disruptions). However, any effects would not be disproportionate or impact mainly or more strongly on minority or low-income populations compared to the community at large. Therefore, the Proposed Action Alternative would have a **negligible** effect on the community.

6.0 PERMITS AND PROJECT CONDITIONS

The project proponent is responsible for obtaining all required federal, state and local permits. While a good faith effort was made to identify all necessary permits for this Environmental Assessment, the following list may not include every approval or permit required for this project. Before, and no later than, submission of a project closeout package, the project proponent shall provide FEMA with a copy of the required permit(s) from all pertinent regulatory agencies.

1. MADEP Superseding Order of Conditions, dated January 14, 2019
2. Certificate of the Secretary of Energy and Environmental Affairs on the Environmental Notification Form, dated November 23, 2016
3. Massachusetts DCR Construction/Access Permit (CP-00240), dated March 19, 2020
4. Department of the Army Permit (NAE-2016-01792), dated December 21, 2018
5. 401 Water Quality Certification
6. Planning or Zoning Board permit/approval
7. Time-of-Year construction restriction for any in-water silt producing work from March 15 - June 30 for the protection of American eel.
8. FEMA Letter of Map Revision
9. NHPA conditions
10. Archeological Site Avoidance and Protection Plan (ASAPP)

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The City of Quincy consulted and/or coordinated with the following federal, state, and local agencies: FEMA, MEMA, MEPA, MassDEP, Quincy Planning and Community Development, Quincy Conservation Commission, Quincy Zoning Board of Appeals, Quincy Department of Public Works, Quincy City Hall, MWRA, MassDCR, and MHC.

Public involvement (notification and hearings) occurred as part of the project review undertaken by MEPA, Quincy Conservation Commission, and Quincy Zoning Board of Appeals.

FEMA Early Public Notice was part of the Disaster Cumulative Public Notice published in the Boston Globe in January 2012.

FEMA published Public Notice for the Availability of Draft Environmental Assessment in the Patriot Ledger and on the Town of Quincy's website on mm/dd.2020 [Date to be determined and populated in Final EA]. Hard copy of the Draft Environmental Assessment was located at: the Quincy Department of Public works at 55 Sea Street, Quincy, MA.

FEMA coordinated and consulted with the Massachusetts State Historic Preservation Office on 10/29/2014 (SHPO concurrence 11/05/2014), 07/03/2019 (concurrence 07/12/2019) and 07/22/2020. Concurrence expected on or around 8/22/2020. Exact date of concurrence will be added to the Final Environmental Assessment.

FEMA coordinated with the Massachusetts Natural Heritage and Endangered Species Program and consulted with USFWS for northern long-eared bat on 6/1/2020. Concurrence was assumed on 7/1/2020.

8.0 REFERENCES

- 16 U.S.C. 470 et seq. National Historic Preservation Act of 1966. Public Law 102 575, as amended.
- 16 U.S.C. 668-668d et seq. Bald Eagle Protection Act of 1940, as amended
- 36 CFR Part 800, Protection of Historic Properties, (incorporating amendments effective August 5, 2004).
- 50 CFR 10.13. Migratory Bird Treaty Act of 1918, as amended.
- CEQ (Council on Environmental Quality), 1997. Environmental Justice: Guidance Under the National Environmental Policy Act.
- DMF (Department of Marine Fisheries), 2016. Letter from DMF responding to ENF Review. Dated 11/14/2016.
- EPA (Environmental Protection Agency), 2020. EJSCREEN: Environmental Justice Screening and Mapping Tool located at <https://www.epa.gov/ejscreen>. Site accessed on 8/14/2020.
- FEMA (Federal Emergency Management Agency), 2012. Flood Insurance Rate Map, City of Quincy, Massachusetts, Norfolk County. Community Panel Number 25021C0207E, dated July 17, 2012. <http://www.msc.fema.gov>.
- FEMA. 1996. National Environmental Policy Act, FEMA Desk Reference. <http://www.fema.gov/library/viewRecord.do?id=3249>.
- FEMA, 2011. *FEMA Climate Change Adaptation Policy Statement* (Administrator Policy 2011-OPPA-01).
- FGDC (Federal Geographic Data Committee), 2013. *Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition*. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC. LEC Environmental Consultants, Inc. Notices of Intent (NOI), dated September 14, 2018.
- LEC Environmental Consultants, Inc. MEPA Environmental Notification Form (ENF), dated September 30, 2016.
- LEC Environmental Consultants, Inc. Department of the Army Permit Application (Pre-Construction Notification), dated September 26, 2018.
- Massachusetts Department of Environmental Protection 401 Water Quality Certification Regulations (314 CMR 9.00).
- Massachusetts Division of Fish and Wildlife, Natural Heritage and Endangered Species Program. http://www.mass.gov/dfwele/dfw/nhesp/species_info/ mesa_list/ mesa_list.htm.
- Massachusetts Geographic Information Systems (MassGIS). Various datalayers.
- Massachusetts Office of Coastal Zone Management. 2008. The Massachusetts Coastal Zone: CZM Jurisdiction website. <http://www.mass.gov/czm/zone.htm>.
- Massachusetts Office of Coastal Zone Management Coastal Barrier Resources System Mapper.
- Mass Audubon Breeding Bird Atlas 2. <https://www.massaudubon.org/our-conservation-work/wildlife-research-conservation/statewide-bird-monitoring/breeding-bird-atlases/bba2>
- National Wild and Scenic Rivers System - Massachusetts List <https://www.rivers.gov/massachusetts.php>.

NHESP (Massachusetts Natural Heritage and Endangered Species Program), 2020. NLEB (northern long-eared bat) Locator. Website located at <https://mass-coeea.maps.arcgis.com/apps/Viewer/index.html?appid=de59364ebbb348a9b0de55f6febfdf52>; last updated June 12, 2019. Site accessed on June 1, 2020.

USDA (U.S. Department of Agriculture) Natural Resources Conservation Service (NRCS) Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/>.

USFWS (U.S. Fish and Wildlife Service), 2016. Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions. 1/5/2016.

USFWS (U.S. Fish and Wildlife Service), 2020. Verification letter for the 'Flood Mitigation Measures at Furnace Brook, Quincy MA' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions. Dated June 1, 2020.

9.0 COMMENTS/RESPONSE

FEMA will populate this section in the Final Environmental Assessment after the close of the 15-day comment period.

APPENDIX A:
Maps and Figures

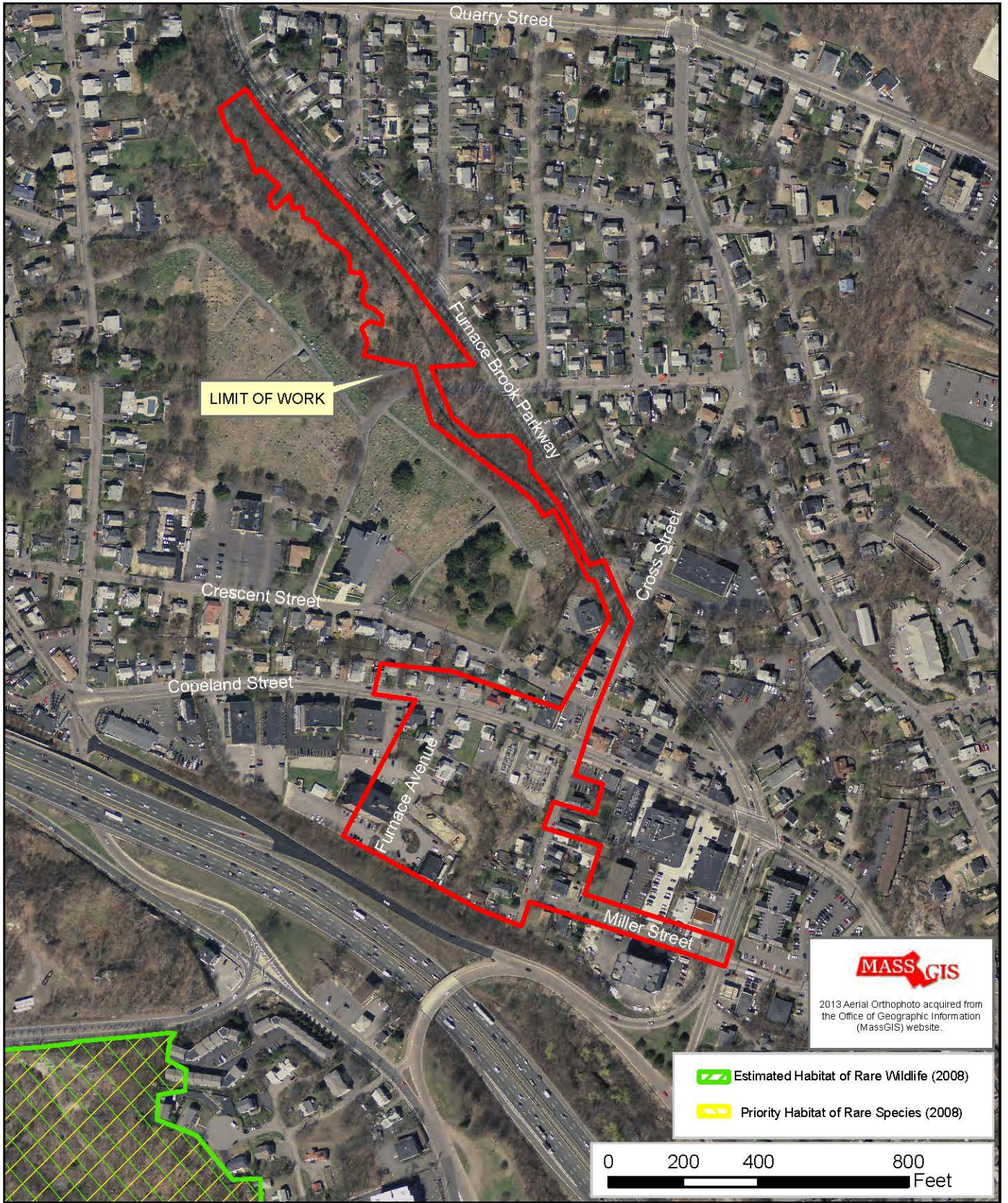


Figure 1: MassGIS Orthophoto & Natural Heritage Priority & Estimated Habitat Map

Miller Street, Cross Street, and Furnace Avenue Flood Control and Furnace Brook Restoration Project
Quincy, Massachusetts



September 28, 2016

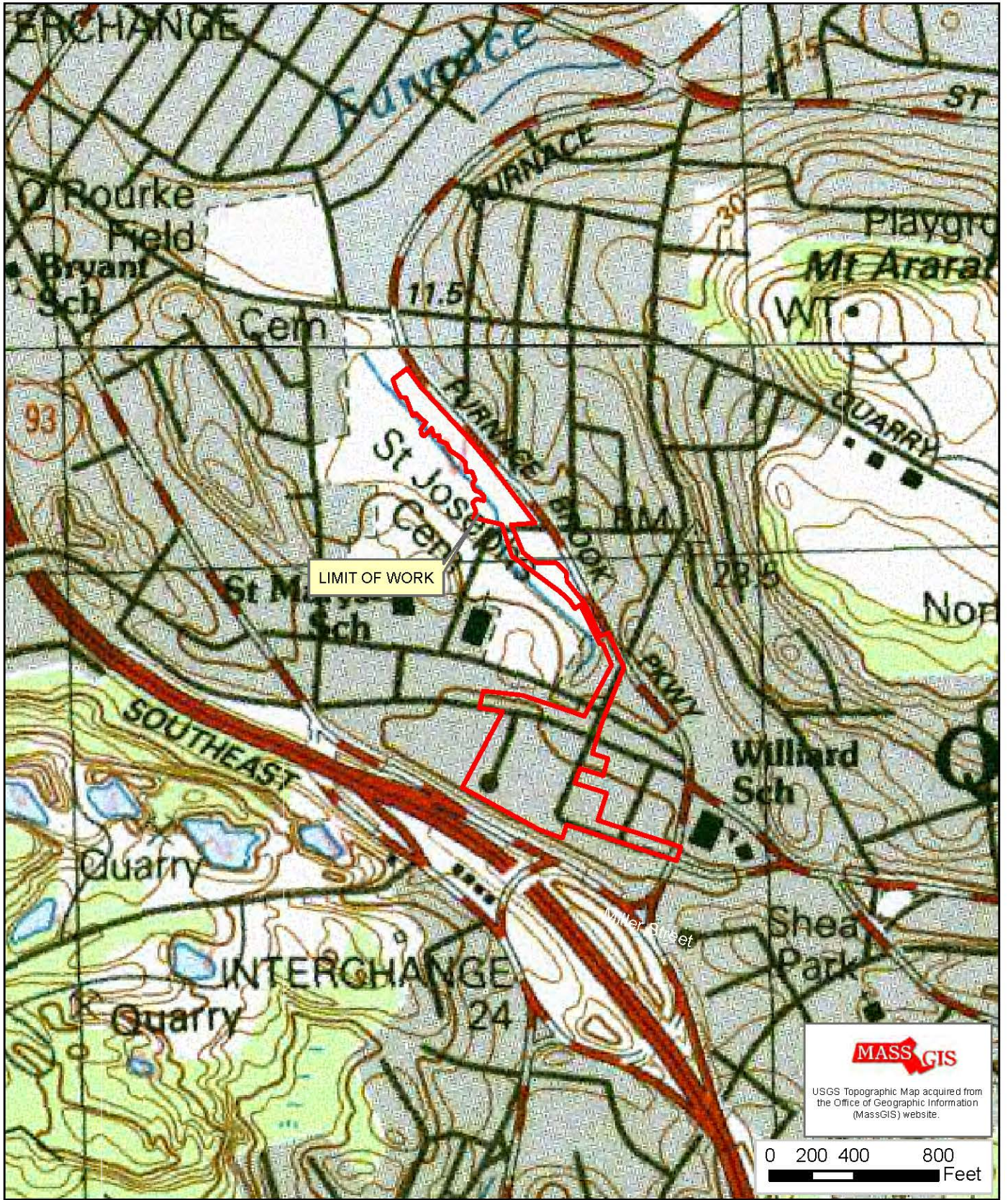


Figure 2: USGS Topographic Map

Miller Street, Cross Street, and Furnace Avenue Flood Control
and Furnace Brook Restoration Project
Quincy, Massachusetts



September 28, 2016

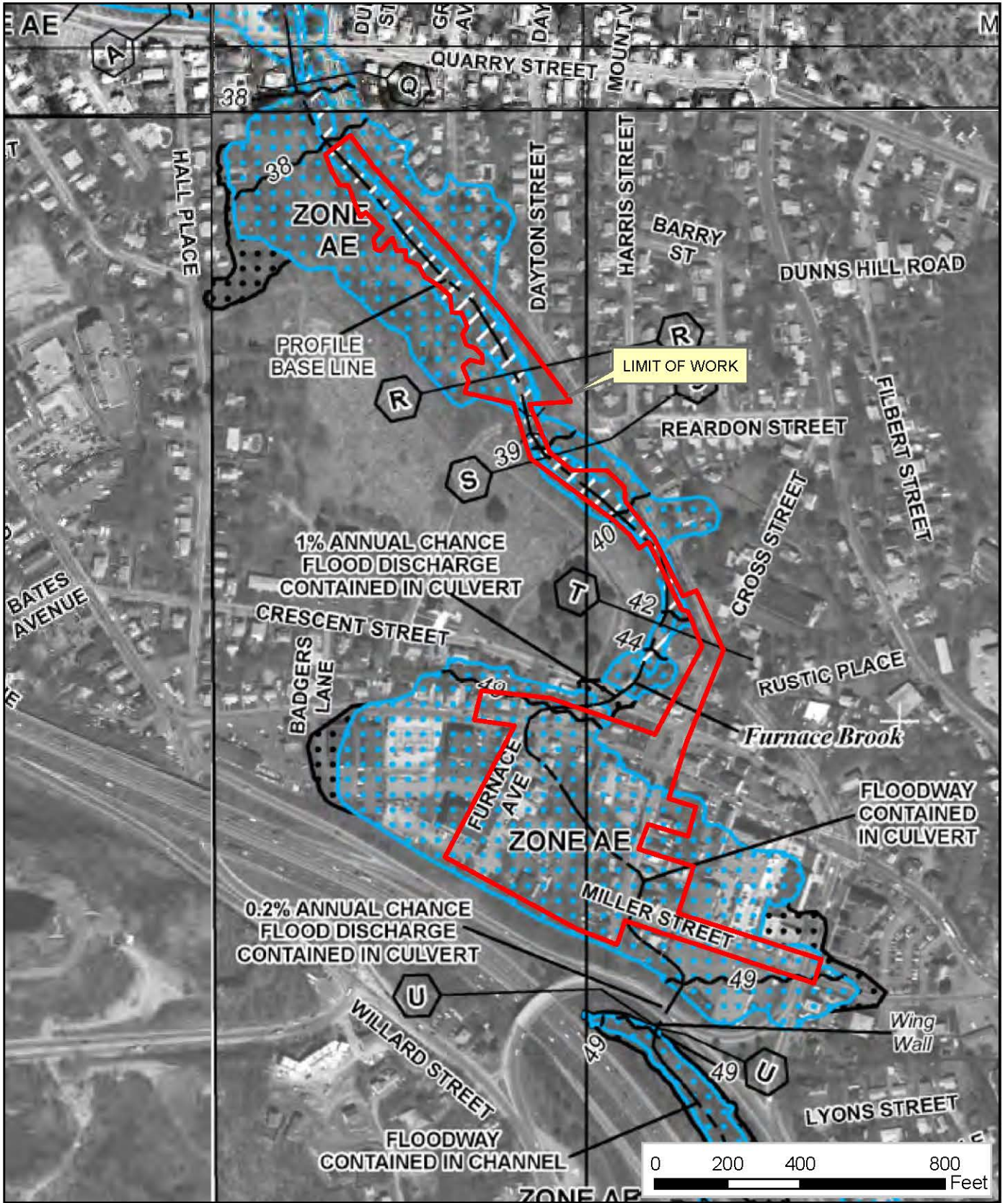


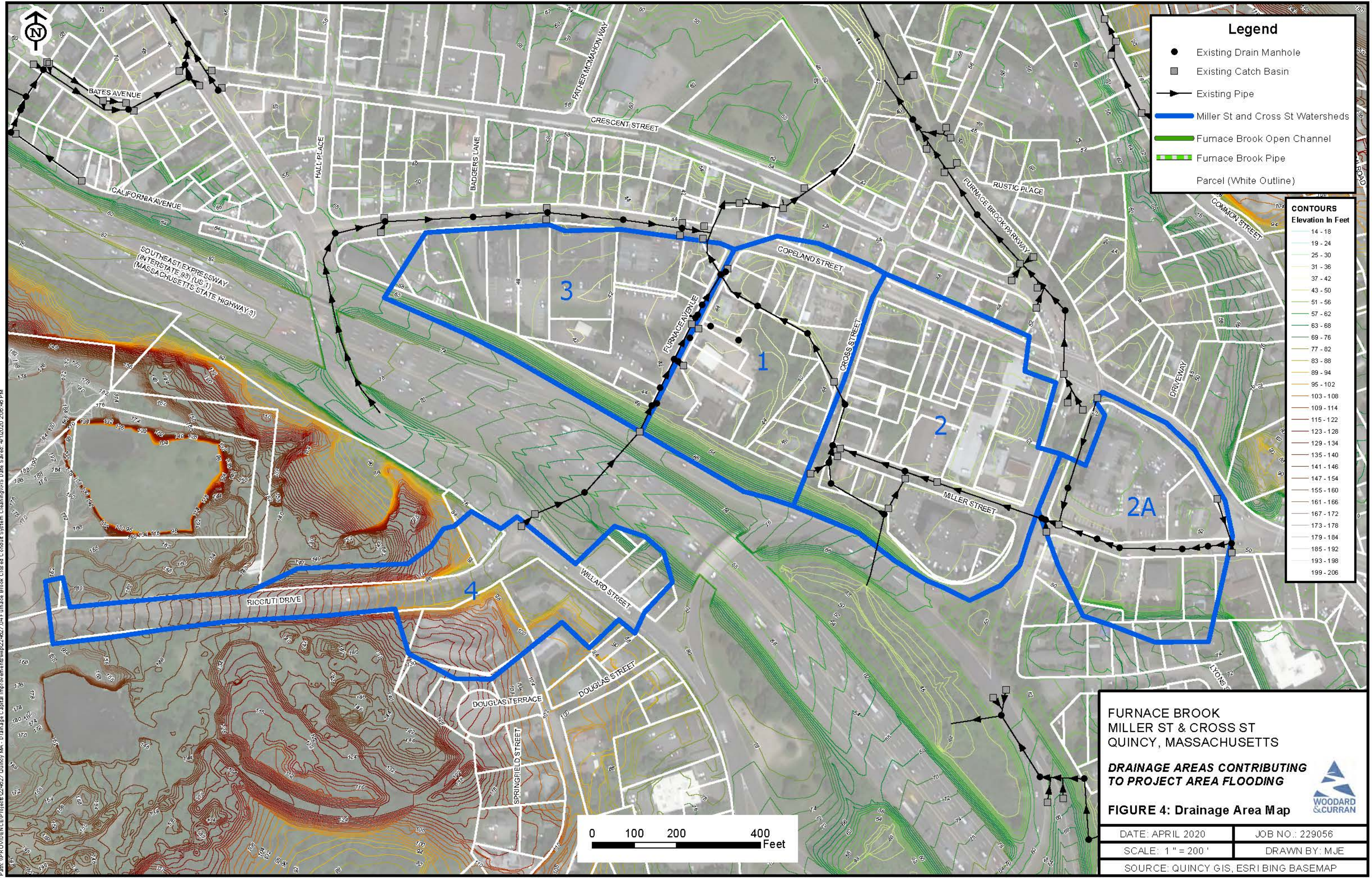
Figure 3: FEMA Flood Insurance Rate Map

Community Panel 25021C0207E

Miller Street, Cross Street, and Furnace Avenue Flood Control
and Furnace Brook Restoration Project
Quincy, Massachusetts



Map Revised:
July 17, 2012



Legend

- Existing Drain Manhole
- Existing Catch Basin
- Existing Pipe
- ▬ Miller St and Cross St Watersheds
- ▬ Furnace Brook Open Channel
- ▬ Furnace Brook Pipe
- ▭ Parcel (White Outline)

CONTOURS

Elevation In Feet

14 - 18
19 - 24
25 - 30
31 - 36
37 - 42
43 - 50
51 - 56
57 - 62
63 - 68
69 - 76
77 - 82
83 - 88
89 - 94
95 - 102
103 - 108
109 - 114
115 - 122
123 - 128
129 - 134
135 - 140
141 - 146
147 - 154
155 - 160
161 - 166
167 - 172
173 - 178
179 - 184
185 - 192
193 - 198
199 - 206

Path: W:\PROVIDENCE\Projects\224627 Quincy MA - Drainage Capital Improvements\wp224627 04 Furnace Brook Closed Conduit System Cleaning\GIS Data Saved - 4/1/2020 2:06:48 PM

FURNACE BROOK
MILLER ST & CROSS ST
QUINCY, MASSACHUSETTS

DRAINAGE AREAS CONTRIBUTING TO PROJECT AREA FLOODING



FIGURE 4: Drainage Area Map

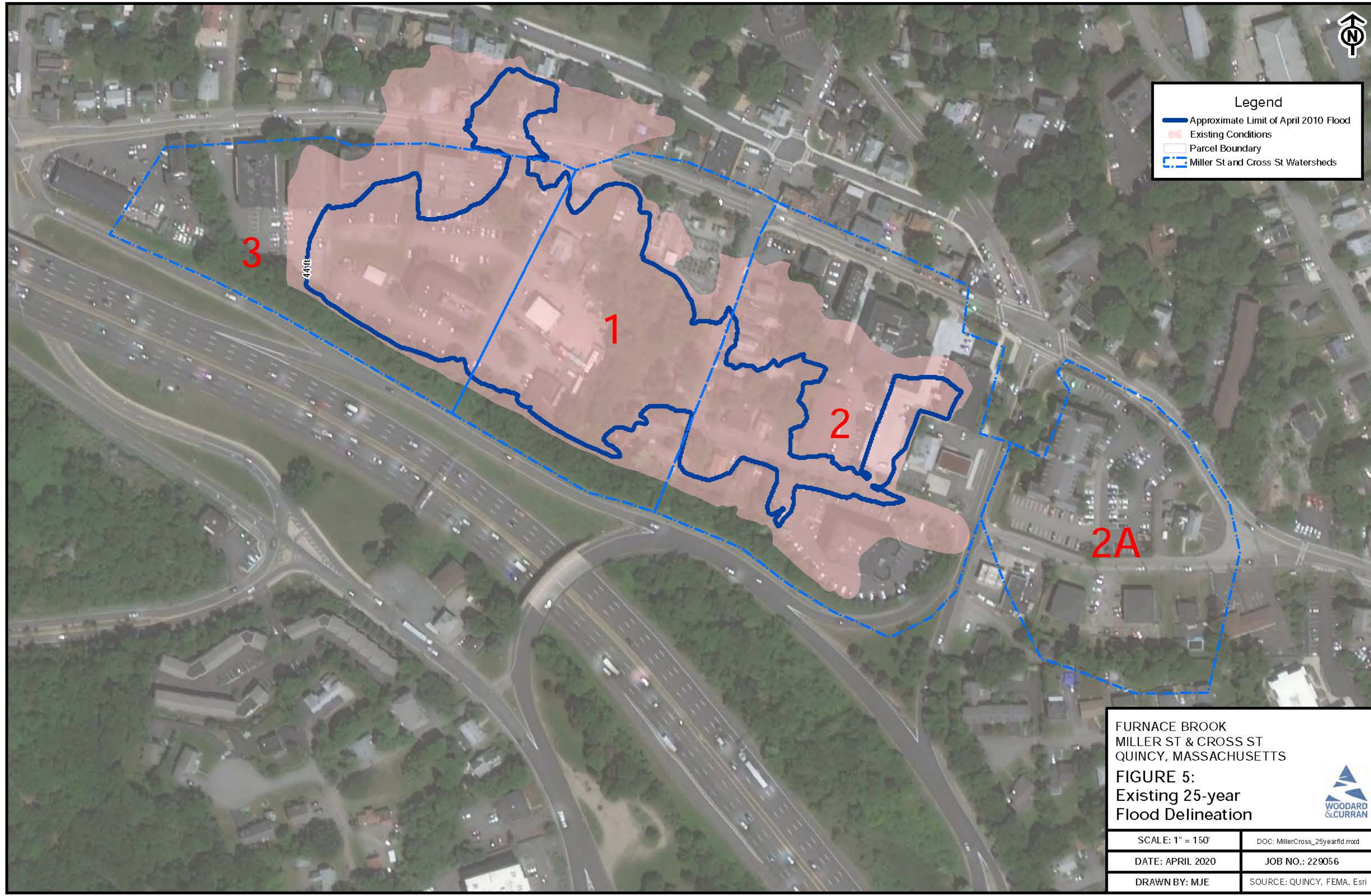


DATE: APRIL 2020	JOB NO.: 229056
SCALE: 1" = 200'	DRAWN BY: MJE
SOURCE: QUINCY GIS, ESRI BING BASEMAP	




Legend

- Approximate Limit of April 2010 Flood
- Existing Conditions
- Parcel Boundary
- Miller St and Cross St Watersheds



FURNACE BROOK
MILLER ST & CROSS ST
QUINCY, MASSACHUSETTS

FIGURE 5:
Existing 25-year
Flood Delineation



SCALE: 1" = 150'	DOC: MillerCross_25yearfld.mxd
DATE: APRIL 2020	JOB NO.: 229056
DRAWN BY: MJE	SOURCE: QUINCY, FEMA, Esri

Area of Potential Effect (APE) Map

Furnace Brook Restoration Project
Quincy, MA



APPENDIX B:

Project Documents and Photos

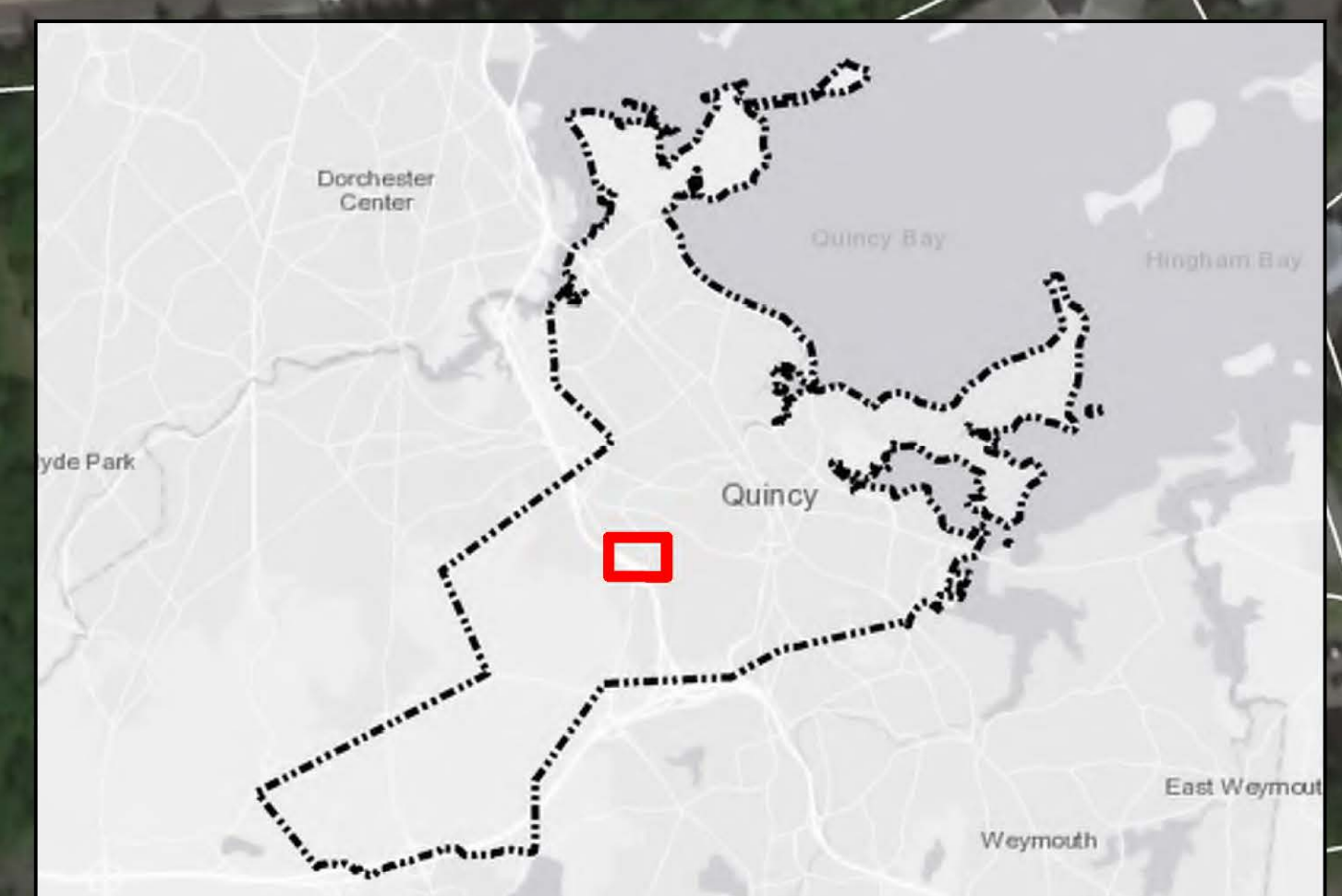


MATCHLINE SEE FIGURE 1A

Legend

- - - Proposed Limit of Work
- Proposed Open Channel Brook Alignment
- Proposed Flood Storage Area
- Proposed Backflow Preventer
- Proposed Pump Station
- Proposed Drain Manhole
- Proposed Catchbasin
- Existing Drain Manhole
- Existing Catch Basin
- Existing Pipe Upgraded To Pressure Line (2012)
- Proposed Drainage Pipe
- Proposed Force Main
- Furnace Brook Open Channel (Existing)
- Furnace Brook Pipe (Existing)
- Existing Pipe
- Parcel (White Outline)


Total Proposed Limit of Work Area = 5.07 Acres



**FURNACE BROOK
MILLER ST & CROSS ST
QUINCY, MASSACHUSETTS
LIMIT OF WORK**

**GRAPHIC 1A:
Project Overview**

DATE: APRIL 2020 JOB NO.: 229056
SCALE: 1" = 80' DRAWN BY: MJE
SOURCE: QUINCY GIS, ESRI BING BASEMAP





Legend

- - - - - Proposed Limit of Work
- Proposed Open Channel Brook Alignment
- Proposed Flood Storage Area
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- Existing Pipe
- Parcel (White Outline)

Total Proposed
Limit of Work Area = 5.07 Acres

Force Main Outfall Into Furnace Brook
With Headwall & Plunge Pool




MATCHLINE SEE FIGURE 1A



**FURNACE BROOK
MILLER ST & CROSS ST
QUINCY, MASSACHUSETTS
LIMIT OF WORK**

**GRAPHIC 1B:
Project Overview**

DATE: APRIL 2020 JOB NO.: 229056
SCALE: 1" = 80' DRAWN BY: MJE
SOURCE: QUINCY GIS, ESRI BING BASEMAP



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GRAPHIC 2: PHOTOS



Photo #1: 24 Furnace Avenue looking east.



Photo #2: Furnace Avenue looking north.



Photo #3: Miller Street looking east.



Photo #4: Furnace Brook from Furnace Brook Parkway looking northwest.



Photo #5: Furnace Brook looking northwest.



Photo #6: Furnace Brook looking northwest.



Photo #7: Furnace Brook looking northwest.

APPENDIX C:
Supporting Documents

REGION 1

EXECUTIVE ORDER 11988 Floodplain Management

EXECUTIVE ORDER 11990 Protection of Wetlands

8-Step Decision Making Process (44 CFR Part 9)

TITLE: Miller Street, Cross Street and Furnace Avenue Area Flood Control and Furnace Brook Restoration Project

LOCATION: Quincy, Massachusetts along Furnace Brook and the surrounding neighborhood (approximately 42.24359, -71.02758 to 42.25017, -71.03038)

BACKGROUND:

The City of Quincy seeks to implement a series of drainage infrastructure improvements and ecological restoration measures to mitigate flooding in a flood prone West Quincy neighborhood. The Miller Street, Cross Street, and Furnace Avenue neighborhood in West Quincy experiences flooding during significant precipitation events due to antiquated drainage infrastructure and a lack of capacity in the closed conduit section of Furnace Brook. The segment of the Brook which flows underground, i.e., the closed conduit section, does not have the capacity to accommodate the volume of stormwater which is directed to it through upstream drainage infrastructure. The topography within and around the neighborhood creates an isolated drainage basin bordered by the Southeast Expressway (Route 93) to the southwest, Copeland Street to the north/northwest, and Furnace Brook Parkway to the east/northeast.

The project area is dominated by moderate to dense urban residential and commercial development, with extensive impervious surfaces and minimal undeveloped land. Currently, Furnace Brook flows northerly through the project area within a subsurface, i.e. underground, conduit consisting of a concrete box culvert measuring four feet high by eight feet wide and a 60-inch Reinforced Concrete Pipe extending from the Southeast Expressway for approximately 1,500 linear feet to an outlet into an open channel approximately 275-feet north of the Cross Street and Crescent Street intersection. The open channel portion of the project is an approximately 1,900-foot-long segment of Furnace Brook that extends in a linear configuration roughly parallel to Furnace Brook Parkway. The open channel segment consists of 12± acres of undeveloped forested uplands and wetlands situated south of Quarry Street, east of Hall Place and the Hall Cemetery, southwest of Furnace Brook Parkway, and northwest of Cross Street. Residential development borders the land to the west, north, and east, and the Cemetery is located to the southwest.

DESCRIPTION OF PROJECT:

The proposed alternative involves drainage infrastructure improvements within the Miller Street, Cross Street, and Furnace Avenue neighborhood watershed area including construction of a pump station with a force main at 20 Furnace Avenue. The proposal also includes ecological restoration on an approximately 900-foot long segment of Furnace Brook between Reardon Street and Quarry Street.

The force main would extend downstream to the open channel section of Furnace Brook, ultimately discharging into a plunge pool and then into Furnace Brook between Cross Street and Reardon Street. The project would also involve repairs to deteriorating segments of the Furnace Brook channel walls between Cross Street and Reardon Street and comprehensive ecological restoration to approximately 900 linear feet of Furnace Brook between Reardon Street and Quarry Street.

Drainage infrastructure improvements in the neighborhood watershed area would consist of replacing existing subsurface drainage pipes, manholes and catch basins (i.e. the stormwater collection system) and installing new subsurface drainage pipes, catch basins and water quality chambers for the purpose of upgrading the functionality of the system and redirecting stormwater from the subsurface closed conduit section of Furnace Brook to the proposed pump station and improving the quality of stormwater. New four-foot-deep sump catch basins with a hood on the

outlet pipe would be installed throughout the Miller Street, Cross Street, and Furnace Avenue neighborhood area. The deep sump catch basins would provide a Total Suspended Solid (TSS) removal rate of 25%.

Granite block wall repairs totaling approximately 200 linear feet are proposed to Furnace Brook between Cross Street and Reardon Street. This work would consist of repairing sections of the wall that have collapsed into the stream by removing the granite blocks and re-setting them in the wall. Additional blocks from the 80-foot-long segment of wall that would be removed for the force main connection would be utilized to repair collapsed sections as necessary.

The project would include ecological restoration on an approximately 900-foot long segment of Furnace Brook between Reardon Street and Quarry Street. The ecological restoration of Furnace Brook is designed to convert the existing linear, manmade stream channel to a sinuous watercourse with sloped earthen embankments providing additional flood storage and a diverse native plant community.

STEP 1: Determine whether the proposed action is located in the 100-year floodplain, which includes the Coastal High Hazard Area (500-year floodplain for critical actions) and/or within a designated wetland.

Yes, the project is located in the 100-year floodplain and Regulatory Floodway as mapped by the Flood Insurance Rate Map Community and Panel No: 25021 C 0207E, Dated: July 17, 2012.

Is the action a functional dependent use (cannot perform its intended purpose unless it is located or carried out in close proximity to water) or a facility or structure that facilitates open space use?

Yes, the proposed work is to improve the flooding situation through work on multiple sections of Furnace Brook and the construction of a new pump station building within the floodplain. Because the purpose of the building is to pump water out of the flooded area, it must be located within the floodplain. Additional limitations on location include availability of city-owned land, i.e. the site of the building is the only city-owned land in the area that contains space for construction of a pump station.

Determine whether the proposed action is within a designated wetland

Yes, the proposed action involves activities within a freshwater wetland. A portion of the pump station site is located within a wetland and the ecological restoration of Furnace Brook involves a perennial stream with an adjacent freshwater wetland. Wetlands were field delineated prior to permitting.

STEP 2 Notify the public at the earliest possible time of the intent to carry out an action in a floodplain and wetland. Involve the affected and interested public in the decision-making process.

The project was presented publicly at a meeting held during the MEPA (Massachusetts Environmental Policy Act) permitting process in the fall of 2016. Abutters were notified and a public hearing was held for the MA Wetlands Protection Act NOI (Notice of Intent) process in fall 2018. Public notice was provided in the Environmental Monitor as part of the MEPA process in 2016, and within a local newspaper (the Patriot Ledger) during the NOI process in 2018.

STEP 3 Identify and evaluate practicable alternatives to locating the proposed action in a floodplain and wetland (including alternatives sites, actions and the "no action" option).

It is not practicable to locate the project outside the 100-year floodplain because the project involves upgrading stormwater and drainage infrastructure and constructing new stormwater and drainage infrastructure within the floodplain; therefore, activity in the floodplain is required and is not avoidable.

Alternative Options:

1. No Action Alternative – The no action alternative is not practicable because the flooding problem would continue to cause damage to public and private property in the neighborhood.
2. Proposed Alternative – Drainage infrastructure improvements within the Miller Street, Cross Street, and Furnace Avenue neighborhood watershed area including construction of a pump station with a force main at 20 Furnace Avenue. Ecological restoration on an approximately 900-foot long segment of Furnace Brook between Reardon Street

and Quarry Street Proposed bank restoration involves removing the existing 4-foot deep linear concrete channel and replacing it with a meandering 2.3-foot deep, 17-ft wide open channel increasing flood storage capacity by over 100,000 cubic feet. In total, approximately 2,200 linear feet of bank alteration and 12,400 square feet of streambed disturbance is proposed.

3. Alternative 1 – Redirecting or pumping flood waters to other watersheds or waterways was ruled out due to construction costs and existing flood capacities in adjacent watersheds.

4. Alternative 2 - Remove privately-owned structures from within the flood-prone area to eliminate potential future damage to property. Due to the extensive number of privately-owned residential and commercial structures in the flood-prone area, this alternative was determined to be cost prohibitive because the city would need to purchase each property and demolish every structure. The combined costs of purchasing the properties and demolishing structures renders this alternative cost prohibitive and would require the support and cooperation of all the property owners.

5. Alternative 3 – Construction of a pump station with associated infrastructure improvements and a force main discharging into Furnace Brook at a reduced rate and including a subsurface stormwater detention system. The subsurface stormwater detention system poses significant complications because of its cost to construct and because it would have to be constructed on city-owned land which is limited in the drainage basin. Because the volume of water needed to be stored is so large, the system would occupy a very large area and no such city-owned area exists within the drainage area. This alternative was deemed impractical and cost prohibitive.

6. Alternative 4 - As an alternative to the full stream restoration plan, consideration was given to repairing sections of the existing vertical walls only. This alternative would result in very minor hydraulic improvements to flow within the stream by removing the stones that have fallen into the stream bed. The stream would continue to flow in the existing hardened linear channel, rapidly conveying stormwater downstream and contributing to flooding issues downstream. This alternative was dismissed as it would have limited improvement to the stream both ecologically and in terms of flood storage capacity.

7. Alternative 5 - A second alternative to the full stream restoration plan involved removing the existing vertical stone walls and earthen berms and restoring the embankments with new slopes between Cross Street and Quarry Street. This option was dismissed because the linear configuration of the channel would remain, and the floodwaters would continue to quickly pass through the area at the current velocity without any significant improvement to the flood storage capacity or ecological function of this area.

STEP 4 Identify the potential direct and indirect impacts associated with the occupancy or modification of floodplains and the potential direct and indirect support of floodplain development that could result from the proposed action.

The project is designed to reduce the risk of flood loss and damage, while improving and preserving natural and beneficial values of the Furnace Brook floodplain and wetland system.

The project would result in a decrease in base discharge and flood hazard potential to other property and structures and would reduce the likelihood of adverse impacts from flooding on human health, safety and welfare in the affected neighborhood. The project area is densely developed, and future growth and development opportunities are very limited.

The pump station construction would result in filling of 2,450 square feet of wetland, with 2,450 square feet of wetland replication provided. By design, the finished floor elevation of the pump station and transformer/generator pad have been set at an elevation of one foot (minimum) above the 500-year flood elevation of 55.63 feet.

The ecological restoration of Furnace Brook would reconfigure the stream and create additional floodplain and bordering wetlands where none currently exist. The project would result in an overall improvement to the floodplain and wetlands by reducing the likelihood of flood damage and providing ecological restoration of Furnace Brook.

STEP 5 Minimize the potential adverse impacts and support to or within floodplains and wetlands identified under Step 4, restore and preserve the natural and beneficial values served by the floodplain and wetlands.

Potential short- and long-term adverse impacts have been avoided and minimized through design considerations and permit conditions. These include siting the pump station as far as feasible from the wetland, submittal of a CLOMR (Conditional Letter of Map Revision) demonstrating “no-rise” of the Base Flood Elevation anywhere within the community for work in the regulatory floodway, the provision of wetland replication as mitigation for unavoidable wetland impacts, and by including extensive ecological restoration of floodplain and wetlands.

STEP 6 Reevaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards or impacts on wetlands, the extent to which it will aggravate the hazards to others, and its potential to disrupt floodplain and wetland resources and second, if alternatives preliminarily rejected at Step 3 are practicable in light of the information gained in Steps 4 and 5. FEMA shall not act in a floodplain unless it is the only practicable location.

The purpose of the project is flood mitigation; the Proposed Action would reduce flood hazards and there would be a net improvement to wetlands with the ecological restoration. Through the CLOMR process, the project would demonstrate “no-rise” of the Base Flood Elevation anywhere within the community. Request to FEMA for the CLOMR is scheduled to be submitted by the project proponent the week of August 10, 2020. None of the other alternatives considered provide both cost effective flood mitigation and ecological restoration. It has been determined by FEMA that the Proposed Alternative is the most practicable alternative available.

STEP 7 Prepare and provide the public with a finding and public explanation of any final decision that the floodplain and wetland is the only practicable alternative.

A public notice will be provided by FEMA and the Town as part of the Environmental Assessment process.

STEP 8 Review the implementation and post - implementation phases of the proposed action to ensure that the requirements stated in Section 9.11 are fully implemented.

Compliance with all design considerations, including the overall project Scope of Work, permits and Special Conditions, i.e. resource-specific project conditions, will be demonstrated to FEMA by the Applicant in the project close-out documentation. Special Conditions related to compliance with 44 CFR Part 9 are included in the REC (Record of Environmental Consideration) for this project and include a local floodplain permit, a CLOMR (as proof of No Rise), local/state wetlands permitting, and Clean Water Act permitting.

Prepared by:

This 8-Step Decision Making Document was prepared as a collaborative effort between the City of Quincy, MA, Woodward and Curran consulting, and the following FEMA EHP staff: David Robbins, Regional Environmental Officer, Eric Kuns, Senior Environmental Protection Specialist and Linda Hutchins, Environmental Protection Specialist.

APPENDIX D:

Finding of No Significant Impact (FONSI)