

Draft Environmental Assessment

Mill River Bank Stabilization Project

Whately, MA

Hazard Mitigation Grant Program FEMA-4097-DR-MA

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Region 1

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Acronyms and Abbreviations

AT&T	American Telephone & Telegraph
BMP	Best Management Practice
BO	Biological Opinion
BUAR	Board of Underwater Archaeological Resources
CMP	Conservation Management Plan
CWA	Clean Water Act
EA	Environmental Assessment
EDB	Ethylene Dibromide
ENF	Environmental Notification Form
FEMA	Federal Emergency Management Agency
FES	Fabric Encapsulated Soil
FONSI	Finding of No Significant Impact
HEC-RAS	Hydrologic Engineering Centers River Analysis System
Mass DEP	Massachusetts Department of Environmental Protection
MEPA	Massachusetts Environmental Policy Act
MHC	Massachusetts Historic Commission
NHESP	Natural Heritage & Endangered Species Program
SHPO	State Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1. Introduction

1.1. DISASTER BACKGROUND AND OVERVIEW

The project is located near 36 Chestnut Plain Road in the Town of Whately, MA, population approximately 1500 (Lat: 42.41942°, Long: -72.62639°) (aka: the Town). The Town has a primary and backup well which are the only drinking water source for many residents. Both wells are located next to the Mill River. In 1987 & 2001 sheet piling was placed in the river bank to prevent erosion but the sheet piling has failed. In 2011, flood flows on the Mill River resulted in bank erosion in the vicinity of the Town of Whately's drinking water wells and pumps. Sections of sheet pile that had been placed between the wells and the river for protection became disconnected from each other during the flood and began leaning into the Mill River. As an emergency measure, riprap was placed between the deformed sheet pile and the bank to provide stability. The top of the sheet pile was anchored to the bank with cables. By the summer of 2013, two of the three cables had failed and the sheet pile continued to lean into the channel. The backup well with its accompanying vault and mechanical equipment are in danger of being destroyed since they are located approximately ten feet (10') from the edge of failed sheet piling. The primary well is about fifty feet (50') from the river. The Town is proposing to move the river into a former river meander channel to further the distance between the river and the wells. The Town feels that this is a better long term solution with fewer environmental impacts than continuing to stabilize the river banks with hard armoring.

1.2. PURPOSE AND NEED

The Purpose of this project is to provide long-term protection of the Town of Whately's drinking water wells with an ecologically and geomorphically-appropriate approach.

The Need is to have a functioning drinking water well for the Town of Whately that is not in danger of failing or becoming contaminated.

2. Alternatives Considered

2.1 NO ACTION ALTERNATIVE

The no action alternative at this location is not a viable alternative. The proximity of the Town's drinking water supply wells to the eroding Mill River bank have put the infrastructure at risk of failure. These wells provide the only drinking water to hundreds of households in Whately, and measures must be taken to protect this infrastructure.

2.2. PROPOSED ALTERNATIVE – CHANNEL RELOCATION

The proposed alternative aims to provide the longest term protection for the wells by moving the channel away from the eroding banks. Under this alternative, the proposed meander bend is more than 200 feet further to the east than the current eroding bank and sheet pile, and it is angled in a different direction. The existing channel will be filled in with soil, logs and root wads to replace the floodplain lost due to new channel construction and to provide protection to the drinking water wells. Trees and shrubs will be planted to take the place of the logs and root wads once they mature.

While at first glance, this alternative may seem complicated, this alternative actually has many benefits for geomorphic, ecologic, and constructability reasons. This alternative includes the activation of a former meander bend to the east of the eroding bank near the wells, creating an active channel up to 200 feet east of the current channel. This channel can be constructed to have no net loss of ecological resources.

The proposed conditions under this alternative would include the following general features:

- Excavation along the abandoned meander bend to remove deposited sediment and re-expose the former channel
- Filling of much of the existing channel between the proposed channel and the Whately wells to the elevation of the existing ground surface to the east of the channel. This will create a wetland surface to replace the wetlands lost to channel construction. This will also provide stability and protection against erosion at the Town wells
- Creation of backwater habitat at the downstream end of the existing channel, just downstream of the Town wells to preserve ecological function
- Logs and root wads will be placed along the outside bend of the proposed channel for bank stabilization and in-stream habitat
- Fabric encapsulated soil lifts will be constructed above the logs placed on the outside meander bend of the proposed channel for additional stabilization. Native seed will be placed within the fabric to establish rapid plant growth and trees and shrubs will be planted within, and adjacent to, the lifts.
- Logs and root wads will be placed into the backwater habitat area for additional habitat enhancement and erosion resistance
- Logs and root wads will be placed within the area to be filled with sediment to provide floodplain roughness until planted trees are able to mature. This will limit the risk of the Mill River reactivating this channel location and causing erosion near the Whately wells
- Trees and shrubs will be planted throughout the filled area in the location of the existing channel as well as along the proposed channel banks; native seed will also be spread throughout all disturbed areas. Vegetation will provide long term resistance to erosion
- The design will result in no net loss of resource areas

The proposed channel dimensions are based on existing channel dimensions upstream of the project site where the channel has not been affected by the erosion around the sheet pile. These channel dimensions are approximately 38 feet wide and 8 feet deep. While the proposed design cross sections shown on Sheet 6 of the designs appear trapezoidal, the actual constructed channel will be more similar to a natural channel shape, as noted on Sheet 5 of the designs (Appendix C). At the proposed meander bend, the outside of the bend will have an excavated pool that is approximately 3 feet deeper than the channel bed up and downstream and the inside of the bend will have a sand bar approximately 3 feet higher than the channel bed up and downstream. At the toe of the outer bend, logs with and without root wads will be anchored into the bank to provide bank stability and in-channel habitat. These logs will be placed up to the elevation at which vegetation will become established, about 1.5 feet below ordinary high water. The void spaces between these logs will be filled with a mix of native fill and rounded river gravel and cobble. All of this fill and rounded stone will be buried by the bank above. Above the elevation that vegetation can become established, two layers of fabric encapsulated soil (FES) lifts will be constructed to provide additional stability and a surface for vegetation to grow. The FES lifts and the bank above the lifts will be sloped at a 2:1 angle for additional stability. The bank above the FES lifts will be covered with surface fabric to provide stability and protection until the seed and plants become established.

This alternative also includes the relocation of the federally listed dwarf wedge mussel as well as multiple state-listed species.

2.3 OTHER ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Sheet Pile and Riprap

This alternative includes the removal of the failed sheet pile and the installation of approximately 60 linear feet of sheet pile that would be driven in deeper than previous sheet pile and would connect the existing stable ends of sheet pile. Based on the existing surveyed conditions at this location and modeling data, scour depths are approximately 17 feet below the top of bank. To provide additional bank toe protection against scour, riprap would be placed along the bank toe. The riprap toe stabilization would extend approximately 160 linear feet so that the channel bank upstream and downstream of the exposed sheet pile was protected. To ensure proper placement of the sheet pile and riprap, it is likely the Mill River flows would need to be pumped around the work area. Pumping river flows is costly monetarily but also costly in its impacts to aquatic organisms. The placement of stone in the channel and the pumping would necessitate all of the same endangered species mitigation measures required by the preferred alternative.

This alternative was considered and eliminated because it maintained the hard stabilization measures and accompanying ecological impacts along the Mill River banks. It does not provide a long-term solution as the sheet pile has a design life of approximately 50 years.

Rock toe with Fabric Encapsulated Soil lift above

This alternative is similar to the sheet pile and riprap alternative, except that fabric encapsulated soil (FES) lifts will be constructed on the banks above the riprap instead of grading the banks and placing fascines along the slopes. The same riprap parameters and conditions would apply for this alternative as were used for the previous alternative, including rock size, thickness of riprap installation, elevation of top and bottom of riprap, and riprap slope. The goal of this alternative is to provide an option with a softer engineering approach that will result in a site with no exposed sheet pile and vegetated bank slopes. This alternative proposes building FES lifts above the entire length of riprap, including adjacent to the sheet pile so that the sheet pile is not exposed in any location.

This alternative was considered and eliminated because it maintained the hard stabilization measures and accompanying ecological impacts along the Mill River banks. It resulted in a loss of regulated resource areas and critical endangered species habitat.

Moving the Wells Elsewhere

Prior to placing the wells in their current location in 1987, the Town of Whately completed multiple geological, geotechnical, and hydrological investigations to determine the best location to build the wells within the Town boundaries. The bedrock in Whately is shallow in the Western Highlands and deeply buried in the Connecticut Valley Lowland. The existing wells located adjacent to the Mill River are near the boundary where the shallow bedrock of the Western Highlands meets the deep bedrock of the Lowlands. In this area, two aquifers have been identified. The shallow 'upper aquifer' has been used in many locations for private wells. In certain areas of town, this aquifer has become contaminated with pesticides such as ethylene dibromide and aldicarb (Coffin & Richardson, Inc., 1985). Under this aquifer are layers of silt and clay. Below the clay lies the 'lower aquifer,' which was identified through geological investigations to be approximately 205 to 210 feet below the ground surface near the location of the existing well. Bedrock at this location was identified at 217 feet below the surface. This aquifer follows the course of a post-glacial stream bed flowing north to south and is therefore narrow and

confined (Coffin & Richardson, Inc., 1985). The aquifer in the northern part of Whately is entirely filled with glacial till and clay and is therefore not satisfactory for a drinking water well. Portions of the aquifer immediately north of the existing well site have sand and gravel, good material to support a well, but these sites are either under the Mill River or too populated to meet the radius-of-protection requirements of 400 feet. With the restraints described above as well as the near-surface sloping bedrock immediately to the west, the Whately drinking water well was drilled in its current location near the Mill River.

Even with these constraints, the Town of Whately evaluated the possibilities of moving the wells slightly west to the top of the river terrace near the pump house as well as directional drilling, but found neither to be viable options. To be outside of the potential impacts of current and future channel erosion and migration, the well would have to be drilled from on top of the terrace about 400 feet west of the Mill River near the existing Whately Water Department pump house. However, a well here is not possible as a residence and two agricultural fields are within the 400-foot radius-of-protection, an area of protection mandated by MA state drinking water regulations.

Even if a well placed on top of the terrace were possible, reaching the aquifer through directional drilling would be complicated by the location of bedrock and the character of the aquifer. The aquifer is more than 100 feet lower in elevation than the bedrock below the Whately pump house (Coffin & Richardson, Inc., 1985), so any directional drilling from this upper terrace would need to avoid the sloping bedrock. The aquifer is also a thin and narrow former stream bed requiring very precise drilling to be accomplished to both find the correct location of the aquifer and intercept it at the correct elevation. A MA-based drilling firm that specializes in directional drilling was contacted to see if these challenges could be overcome. The following key points from this discussion resulted in this firm suggesting that it would not be possible to directionally drill a drinking water well at this location:

- Directional drilling in MA and New England is typically completed for pipelines and utilities. Drilling is horizontal and there is an exit hole that is then used to pull the pipe through the hole just drilled.
- Directional drilling is precise with an operator on the surface being able to change the angle of the drill bit using a locator on the end of the drill. However, the locator on the end of the drill can only send and receive signals and information to a depth of approximately 125 feet. Because the Whately aquifer is over 200 feet below the ground surface, drilling would be unguided for more than 75 feet.
- Directional drillers in MA and New England typically do not drill deeper than 50 or 60 feet, with some going as deep as 100 feet. Most of the drilling is horizontal, not vertical. While they do use directional drilling for water wells in some cases, these are not deeper than 50 or 60 feet.

The challenges presented by the local geology, characteristics of the lower aquifer, and the technological limitations result in the directional drilling alternative not being a feasible alternative for the Whately wells.

Connecting the Whately public water supply distribution system to an adjacent community public water supply system

This alternative was never given serious consideration due to the anticipated costs, the geography and population of Whately. Whately is sparsely populated in an area of the state where population centers are spread out and utilities are not connected across town boundaries, or even within town boundaries, because of the distances needed to carry these utilities. Connecting water lines across the Town of Whately to the other public water supply system would be cost prohibitive and it is unknown if it would have sufficient water supply for the entire town.

3. Affected Environments and Potential Impacts Considered

The **No Action Alternative** consists of the continued use of the wells with the risk of failure or contamination remaining.

The **Proposed Alternative** will have direct impacts to the river channel and floodplain.

Table 3.1 summarizes the effects described and analyzed in this section. Levels of potential effect are defined as follows:

- * 1 - Negligible: The resource area would not be affected. Changes would be non-detectable or if detected, effects would be slight and local. Impacts would be well below regulatory limits.
- * 2 - Minor: Changes to the resource would be measurable, but the changes would be small and localized. Impacts would be within or below regulatory limits. Mitigation measures may be necessary to reduce potential effects.
- * 3 - Moderate: Changes to the resource would be measurable and have localized and potentially regional scale impacts. Impacts would be within or below regulatory limits, but historical conditions would be altered on a short-term basis. Mitigation measures may be necessary to reduce potential effects.
- * 4 - Major: Changes would be readily measurable and would have substantial consequences on a local and potentially regional level. Impacts would exceed regulatory limits. Mitigation measures to offset the effects would be required to reduce impacts, although long-term changes to the resource would be possible.

Table 3-1.

PROJECT ALTERNATIVES: SUMMARY OF POTENTIAL EFFECT, COORDINATION AND MITIGATION APPLIED

Water Quality

No Action Alternative

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No Impacts Identified.

Proposed Alternative

IMPACT: 1

Agency Coordination/ Permits: MassDEP: received emergency authorization

Mitigation/BMPs: All construction will be completed outside of the actively flowing Mill River. Sediment and erosion control BMPs will be used.

Comments: No Impacts Identified.

Floodplains

No Action Alternative

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No Impacts Identified.

Proposed Alternative

IMPACT: 2

Agency Coordination/ Permits: MassDEP: received emergency authorization; under Section 404 USCOE review

Mitigation/BMPs: Floodplain lost due to channel construction will be replaced by floodplain created with the filling of the existing channel adjacent to the wells.

Comments: Net gain of 850 square feet. See attached Alternatives Analysis.

Wetlands**No Action Alternative**

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No Impacts Identified.

Proposed Alternative

IMPACT: 2

Agency Coordination/ Permits: MassDEP: received emergency authorization; under Section 404 USCOE review

Mitigation/BMPs: Wetlands lost due to channel construction will be replaced by wetlands created with the filling of the existing channel adjacent to the wells.

Comments: Net gain of 850 square feet. See attached Alternatives Analysis.

Threatened and Endangered Species**No Action Alternative**

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No Impacts Identified.

Proposed Alternative

IMPACT: 3

Agency Coordination/ Permits: Section 7 review

Mitigation/BMPs: Listed species will be relocated prior to construction and additional mitigation measures employed.

Comments: Net increase in functional habitat. See attached CMP and Habitat Assessment

Historic Properties**No Action Alternative**

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No Impacts Identified.

Proposed Alternative

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No impacts identified. See attached historical/archaeological report.

Public Services and Utilities

No Action Alternative

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: Current bank protection is failing; no action could result in further bank failure and well impacts.

Proposed Alternative

IMPACT: 2 – Beneficial Impact

Agency Coordination/ Permits: NA

Mitigation/BMPs: The Project is mitigation by improving protection of drinking water wells.

Comments: Work will be completed in the vicinity of the public drinking water wells. The work is designed to protect the wells, so we do not anticipate impacts.

Cumulative impacts

No Action Alternative

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: No Impacts Identified.

Proposed Alternative

IMPACT: 1

Agency Coordination/ Permits: NA

Mitigation/BMPs: NA

Comments: DE Minimis Impact

SUMMARY

The Proposed Alternative will have No to Minor Changes to the resource would be measurable, but the changes would be small and localized. Impacts would be within or below regulatory limits. Mitigation measures may be necessary to reduce potential effects

IN THE FOLLOWING SECTION:

The **No Action Alternative** is not evaluated. Since there is no added adverse effect to the affected environment and the consequences are only addressed in Table 3-1 in this EA.

The **Proposed Alternative** will have direct effect on the river channel and floodplain and is discussed further.

3.1 WATER QUALITY

The primary goal of this project is to protect the drinking water supply for the Town of Whately. The construction will involve active work within the Mill River channel and along its banks and floodplains. Best management

practices (BMPs) will be employed to minimize the impact to the waterway. All construction will be completed outside of the active flows of the river - the proposed channel will be constructed while water is flowing in the existing channel; once the proposed channel is activated and water is flowing through it, the existing channel will be blocked off and filled. Other erosion and sediment control BMPs including silt fence around the staging and access areas will also be utilized.

The **Proposed Alternative** will have no effect on the water quality of the Mill River.

3.2 FLOODPLAINS

A floodplain is an area of land adjacent to a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding during periods of high discharge. Executive Order 11988 directs federal agencies to assume leadership in avoiding direct or indirect support of development in the 100 year floodplain. See Appendix D-3 for the 8-step document for the alternatives review for compliance with this requirement.

The **Proposed Alternative** will have direct effect on the existing floodplains and is discussed further below. Please see the Final 8-Step Process document for Floodplain Management for more information.

Potential Impacts: Much of the proposed work will be completed within the 100 year floodplain. None of this work includes the construction of infrastructure within the floodplain.

Need for Mitigation: The floodplain lost due to new channel constructed will be replaced by new floodplain in the existing channel with a net gain of approximately 850 square feet.

The preferred alternative results in little overall net change to the Mill River floodplain. The water surface elevations under flood stages up to the 100-yr flood do not change under proposed conditions when compared to the existing conditions in the one-dimensional hydraulic model, HEC-RAS. While existing floodplain is being removed to create the new channel, additional floodplain will be created through the filling of the existing channel. There will be no change in flood elevations or flood storage as a result of this project. A no-rise certificate is not necessary for this project.

3.3 WETLANDS

A wetland is a land area that is saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem. Executive Order 11990 requires federal agencies to avoid adverse impacts to wetlands to the extent possible. Section 404 of the Clean Water Act (CWA) establishes a wetland permit program administered by the U.S. Army Corps of Engineers (USACE).

The **Proposed Alternative** will have direct effect on the existing wetlands and is discussed further.

Potential Impacts: Much of the proposed work will be completed within existing wetlands. None of this work includes the construction of infrastructure within the wetland.

Need for Mitigation: The wetlands lost due to new channel constructed will be replaced by new wetlands in the existing channel with a net gain of approximately 850 square feet.

The preferred alternative results in little overall net change in resource areas because the resource areas are exchanged between the existing and proposed work areas. The proposed channel is currently wetland but will become land under water and river bank, and the existing channel is currently land under water and river bank but will become bordering vegetated wetland. While this alternative will have temporary impacts to bordering vegetated wetland, river bank, and land under water, the fully constructed project will result in no net loss of river bank. It will result in an increase of 850 square feet of bordering vegetated wetland, and an increase of 1,750 square feet of land under water (Table 1).

Table 1: Preferred Alternative resource area impacts

Resource Area: Bank

Units: Linear feet

Proposed Alteration: 1,490

Proposed Replacement or Restoration: 1,490

Net Loss/Gain: 0

Amount Degraded as Habitat: 0

Resource Area: Bordering Vegetated Wetlands

Units: Square feet

Proposed Alteration: 40,950

Proposed Replacement or Restoration: 41,800

Net Loss/Gain: 850 square feet gain

Amount Degraded as Habitat: 0

Resource Area: Land Under Water Bodies

Units: Square feet

Proposed Alteration: 22,650

Proposed Replacement or Restoration: 24,400

Net Loss/Gain: 1750 square feet gain

Amount Degraded as Habitat: 0

Resource Area: Bordering Land Subject to Flooding

Units: Square feet

Proposed Alteration: 27,878

Proposed Replacement or Restoration: 27,878

Net Loss/Gain: 0

Amount Degraded as Habitat: 0

Resource Area: Bordering Land Subject to Flooding

Units: Cubic feet of flood storage

Proposed Alteration: 135,000

Proposed Replacement or Restoration: 135,000

Net Loss/Gain: 0
Amount Degraded as Habitat: 0

Resource Area: Isolated Land Subject to Flooding
Units: Square feet
Proposed Alteration: NA
Proposed Replacement or Restoration: NA
Net Loss/Gain: NA
Amount Degraded as Habitat: NA

Resource Area: Isolated Land Subject to Flooding
Units: Cubic feet of flood storage
Proposed Alteration: NA
Proposed Replacement or Restoration: NA
Net Loss/Gain: NA
Amount Degraded as Habitat: NA

Resource Area: Riverfront Area
Units: Square feet within 100 ft.
Proposed Alteration: 117,600
Proposed Replacement or Restoration: 123,250
Net Loss/Gain: 5,650 square feet gained
Amount Degraded as Habitat: 0

Resource Area: Riverfront Area
Units: Square feet between 100 and 200 ft.
Proposed Alteration: 121,100
Proposed Replacement or Restoration: 122,400
Net Loss/Gain: 1,300 square feet gained
Amount Degraded as Habitat: 0

Resource Area: Riverfront Area
Units: Total Square feet
Proposed Alteration: 238,700
Proposed Replacement or Restoration: 245,700
Net Loss/Gain: 6,950 square feet gained
Amount Degraded as Habitat: 0

*** 25,700 square feet is temporary impacts from staging area that will be returned to bordering vegetated wetland**

SUMMARY

The proposed conditions will result in a small gain in bordering vegetated wetlands. The wetlands classified on both sides of the Mill River are marginal, with multiple wetland and multiple upland plant species. According to digital resources, MassDEP has identified the wetlands in the proposed channel alignment as deciduous wooded

wetland (Appendix D). The wetland characteristics suggested by MassDEP were confirmed during field investigations (see Wetland Delineation in Appendix D), and the entire area within the limits of disturbance on the east side of the river was assumed to be wetland.

The proposed wetland area, within the existing channel that will be filled, will be similar to the existing wetland in the proposed channel. Groundwater was measured at a similar elevation along the banks adjacent to the existing channel, so it is expected that groundwater will provide similar moisture conditions. The vegetation that will be planted will be based on the vegetation identified during field investigations. Trees, shrubs, and forbs of the same and similar species will be planted in this area.

The wetlands delineated to the west of the Mill River will not be impacted by active construction. The open fields that have been farmed for decades are delineated as wetland (Appendix D). The staging and stockpiling area for this alternative is in the open field south of the wells. To minimize the impact to these fields classified as wetland, a marker barrier will be placed on the ground prior to dumping fill in the stockpile area. This will ensure that the ground will not be dug into when this fill is being moved around during construction. In areas with frequent vehicle traffic, bamboo or other matting will be placed to dissipate the tire pressure and minimize impacts to the ground. Following construction, the staging and stockpile area will be reseeded and planted with a custom seed mix to replicate the existing plant species and diversity (see plant species in wetland delineation, Appendix D).

3.4 THREATENED AND ENDANGERED SPECIES

Through the Section 7 process, the U.S. Fish and Wildlife Service (USFWS) has reviewed relevant documents and issued a Biological Opinion (BO) on the effects of the Mill River project on the federally threatened northern long-eared bat (*Myotis septentrionalis*) and the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*) (Appendix D-1).

As stated in the cover letter to the BO, the USFWS concurs with FEMA's not likely to adversely affect determination received on June 17, 2015 for the northern long-eared bat. The project is unlikely to adversely affect the northern long-eared bat because all trees to be removed will be cut after September 30, avoiding the summer active season and the remaining forest will continue to provide sufficient and suitable roosting habitat.

For the dwarf wedgemussel, the USFWS determined that the level of anticipated take during this project is not likely to jeopardize the continued existence of the dwarf wedgemussel; while significant short-term effects will occur, the time of year restriction, the relocation of mussels out of the work area, and measures to reduce and avoid sedimentation will help to minimize the extent of the take. The USFWS anticipates that incidental take of the dwarf wedgemussel is likely, but the number of impacted individuals is unknown:

In summary, we anticipate take in the form of mortality of a limited number of dwarf wedgemussels not encountered during the pre-construction relocation effort will occur within the area receiving temporary and permanent fill. Take in the form of harassment may also occur during and after the mussels have been relocated. Relocated mussels may be stressed affecting their ability to feed and/or reproduce or may expend extra energy in finding suitable microhabitat, possibly inhibiting growth in that year. We do not anticipate take from sedimentation, given the conservation measures addressing erosion control.
(page 19 of the BO)

The BO also discusses reasonable and prudent measures to further minimize the impacts of incidental take of the dwarf wedgemussels and describes the terms and conditions with which the contractors must comply. The reasonable and prudent measures include 1) avoiding and minimizing siltation of the water in the Mill River and 2) the number of dwarf wedgemussels killed as a result of fill or exposure must be minimized. The terms and conditions associated with these two reasonable and prudent measures include a time of year restriction, spill prevention measures, refueling requirements, selection of a suitable relocation site for mussels, surveys of the project area to relocate mussels prior and during construction, and monitoring of the mussels and relocation site(s) following construction. These terms and conditions are described in detail on pages 20 and 21 of the BO.

Reporting and monitoring requirements are described on page 21 of the BO and include a summary report of construction 6 months following project completion and multiple reports regarding the relocation of the dwarf wedgemussels: 3 months after the initial relocation and 3 months after each follow-up survey.

The **Proposed Alternative** will have direct effect on state and federally listed species and is discussed further.

Potential Impacts: The work area is within identified habitat for three species of state-listed mussels (one federally listed), one species of state-listed flower, and one species of state-listed turtle. Individuals of all of the species have been observed on site.

Need for Mitigation: Please see the attached Conservation Management Plan (CMP) for the mitigation measures proposed.

The Mill River is an important resource for three listed mussel species: dwarf wedgemussel, creeper, and eastern pondmussel. The habitat for these mussels is degraded under existing conditions due to the exposed sheet pile and riprap along the bed and banks of the river. The preferred alternative provides natural channel substrate and channel dimensions, similar to those found upstream, that can be utilized by all three species of endangered mussel. All of the proposed alternatives will require the relocation of mussel individuals from the few hundred feet of river channel adjacent to the Whately wells. Under the preferred alternative, the existing channel will be filled in with the soil from the proposed channel alignment. The preferred alternative provides the greatest potential habitat for mussels of all the remaining alternatives.

The USFWS BO describes terms and conditions for siltation and/or contamination control measures. The Project Manual and Technical Specifications that will guide the contractors work includes the details that meet these terms and conditions:

- Section 02400 Bank Treatment, Section 2.3. Fabric Encapsulated Lift Bank Treatments - fabric shall be 100% biodegradable
- Section 00200 Advertisement for Bid - Project shall be complete no later than November 30, 2015, so no work will be done in the channel or otherwise from April 1 to May 31
- Section 02100 Water Management, Erosion and Pollution Control, Section 1.3 Submittals - the Contractor must submit an in-stream erosion control plan to be approved by the Owner and Engineer; the Contractor must also submit a Spill Prevention Plan for approval prior to work. This spill prevention plan will include measures to refuel away outside of the channel and wetlands, using biodegradable hydraulic fluids, having a spill cleanup kit and all absorbent materials necessary for spills or refueling, and for storing all vehicles outside of the channel and wetlands.
 - Section 3.4.H. Control of Chemical Waste - the Contractor must take special measures to prevent chemicals, fuels, oils, greases, herbicides, and insecticides from entering the drainage ways.

In addition, the project Drawings describe methods to eliminate or minimize downstream siltation. All new channel construction will be completed outside of the actively flowing Mill River with bulk bag check dams preventing water from entering the channel construction area. Once the new channel is constructed, the check dams will be moved to block off the existing channel and allow water through the new channel. While work is being completed in the existing channel (filling with soil and large wood), no actively flowing water will be moving through this work area. Sheet 11 of the drawings describes the details of these check dams as well as a pump discharge sediment control system for any water that needs to be pumped out of the work area to complete the work.

Table 2 Available habitat for listed species under both existing and proposed conditions for the preferred alternative (Alternative 2)

Species: Dwarf Wedgemussel

Preferred Habitat Type: Clay, silt, sand substrate; variable water depth; near or under woody debris and overhanging vegetation

Found 2012: 6

Found 2013: 15

Area of Habitat Under Existing Conditions: Entire land under water: 22,650 square feet (40 feet of exposed sheet pile limits habitat at this location); 2-3 logs

Area of Habitat Under Proposed Conditions: Entire land under water: 24,400 square feet; 40-50 logs and root wads

Habitat Net Gain/Loss: GAIN: 1,750 square feet; 38-48 logs and root wads

Species: Creeper

Preferred Habitat Type: Clay, silt, sand substrate; variable water depth; near or under woody debris and overhanging vegetation

Found 2012: 3

Found 2013:

Area of Habitat Under Existing Conditions: Entire land under water: 22,650 square feet (40 feet of exposed sheet pile limits habitat at this location); 2-3 logs

Area of Habitat Under Proposed Conditions: Entire land under water: 24,400 square feet; 40-50 logs and root wads

Habitat Net Gain/Loss: GAIN: 1,750 square feet; 38-48 logs and root wads

Species: Eastern Pondmussel

Preferred Habitat Type: Clay, silt, sand substrate; variable water depth; near or under woody debris and overhanging vegetation

Found 2012: 11

Found 2013: 20

Area of Habitat Under Existing Conditions: Entire land under water: 22,650 square feet (40 feet of exposed sheet pile limits habitat at this location); 2-3 logs

Area of Habitat Under Proposed Conditions: Entire land under water: 24,400 square feet; 40-50 logs and root wads

Habitat Net Gain/Loss: GAIN: 1,750 square feet; 38-48 logs and root wads

Species: Winged Monkey-flower

Preferred Habitat Type: Open section of banks close to the water with canopy cover and adjacent herbaceous species

Found 2012: 2

Found 2013: 16

Area of Habitat Under Existing Conditions: 600 square feet

Area of Habitat Under Proposed Conditions: 750 square feet

Habitat Net Gain/Loss: GAIN: 150 square feet

Species: Wood Turtle

Preferred Habitat Type: Aquatic foraging: entire Mill River in study area.

Found 2012:

Found 2013:

Area of Habitat Under Existing Conditions: 22,650 square feet

Area of Habitat Under Proposed Conditions: 24,400 square feet

Habitat Net Gain/Loss: GAIN: 1,750 square feet

Species: Wood Turtle

Preferred Habitat Type: Overwintering habitat & cover: large wood structures, deep water.

Found 2012:

Found 2013:

Area of Habitat Under Existing Conditions: 2-3 logs; 2,800 square feet deep water

Area of Habitat Under Proposed Conditions: 40-50 logs and root wads; 3,000 square feet deep water

Habitat Net Gain/Loss: GAIN: 38-48 logs and root wads; 200 square feet deep water

Species: Wood Turtle

Preferred Habitat Type: Basking & nesting: sandy banks.

Found 2012:

Found 2013:

Area of Habitat Under Existing Conditions: 1,550 square feet

Area of Habitat Under Proposed Conditions: 40-50 logs and root wads; 3,000 square feet deep water

Habitat Net Gain/Loss: GAIN: 38-48 logs and root wads; 200 square feet deep water

Species: Wood Turtle

Preferred Habitat Type: Terrestrial foraging: overgrown fields.

Found 2012:

Found 2013: 1

Area of Habitat Under Existing Conditions: 26,500 square feet

Area of Habitat Under Proposed Conditions: 26,500 square feet

Habitat Net Gain/Loss:

Species: Northern Long-Eared Bat

Preferred Habitat Type: Roosting habitat: trees greater than 3 inches in diameter with furrows and rough bark.

Found 2012:

Found 2013:

Area of Habitat Under Existing Conditions: 40-50 trees greater than 3 inches in diameter.

Area of Habitat Under Proposed Conditions: Adjacent floodplains outside the project area will remain intact with many suitable roost tree.

Habitat Net Gain/Loss: Since trees will be removed after September 30, and the adjacent floodplain will remain intact, the project is not likely to have an adverse effect.

*Identified by Scott Jackson, Whately Conservation Commission; all mussel and winged monkey-flower individuals identified by Biodiversity

SUMMARY

The Proposed Alternative will have No Net Loss but will have Net Gains to habitat

3.5 HISTORIC AND CULTURAL RESOURCES

Based on the scope of work and the ground disturbing activity to install the temporary bridge for construction access, excavating along the abandoned meander bend, along with equipment and material staging, FEMA coordinated with the State Historic Preservation Officer (SHPO) to address cultural resources in the area. On October 27, 2014 FEMA sent Massachusetts Historic Commission (MHC) a recommendation for an archaeological survey to be performed based on this undertaking. The rationale was that along with additional archaeological sites being found within 0.5 miles of this project location along the Mill River, there is a recorded site, Site 19-FR-322 or the Meunier Site immediately adjacent to this project location.

The Meunier Site was discovered during a 1987 survey for the Whately Municipal Water System. The 1987 survey, conducted by University of Massachusetts (Amherst) Archaeological Services, included two survey units, the northern segment is located several miles to the northwest at the end of Depot Rd and ran through the Whately Center Cemetery, and this area will not be covered in this letter. The excavation in the southern segment is the area that is within this project area and resulted in the discovery of the Meunier Site. Two spot finds were discovered during the excavation of this site, both of which are byproducts of stone tool production.

During the Massachusetts Environmental Policy Act (MEPA) Environmental Notification Form (ENF) review period, the Secretary of Energy and Environmental Affairs received a letter of no impact from the Board of Underwater Archaeological Resources (BUAR) (See page 10 of the MEPA ENF decision). In addition, MHC suggested, in a November 4, 2014 letter to FEMA, that the impact area for this project is located within deep alluvial deposits within former and current river channels. Ultimately the project area is unlikely to contain intact, significant archaeological resources and therefore rather than an archaeological survey, the project will result in "no historic properties affected". (See MHC letter, Appendix E-1) FEMA concurs with MHC on the determination that this project will result in "no historic properties affected" and will condition the project so that if any resources or remains are found upon construction that work will cease immediately and FEMA, MHC, and MEMA will be contacted immediately to determine the actions moving forward.

The **Proposed Alternative** will not have direct effect on historic and cultural resources.

Potential Impacts: None identified.

Need for Mitigation: None identified.

3.6 PUBLIC SERVICES AND UTILITIES

The primary purpose of this project is to provide long term protection for the Town's public drinking water wells. These wells will not be directly impacted by constructed, but will benefit substantially by the work as proposed. AT&T maintains an easement through the work area for a buried cable that is no longer being used. Upon consultation with AT&T personnel, it was determined that the cable would be cut where the new channel is to be constructed and a small conduit will be placed multiple feet below the elevation of the new channel bottom. This conduit will be capped on both ends and not reconnected to the unused cable, but will be available in the event that AT&T does want to use that again.

The **Proposed Alternative** will have a beneficial impact on public services and utilities.

Potential Impacts: Public drinking water wells will be protected.

Need for Mitigation: None identified.

Cumulative Effects

Cumulative effects are those that result from an incremental effect of the Proposed Alternative when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other action (40 C.F.R. 1508.7). Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in or near the action area. The Proposed Project involves moving a portion of the Mill River to protect the existing wells. The River will continue to serve the community in the same capacity, providing habitat for many animals, fish and amphibians. No cumulative effects are anticipated.

The **Proposed Alternative** will have no cumulative effects impact.

Potential Impacts: None identified.

Need for Mitigation: None identified.

4. Public Involvement

4.1 PUBLIC MEETINGS

The preliminary designs for the proposed alternative have been made available to the public in 2013, and a meeting was held during the MEPA permitting process in the fall of 2013. A hearing was held for the Wetlands Protection Act Notice of Intent process in early 2014. The public has been updated on the project through regular town meeting requests for approval of additional funding and resources.

The Town of Whately will notify the public of the availability of the Draft EA and a Draft Finding of No Significant Impact (FONSI) through publication of a notice in the local paper, as required. A public comment period will commence on the initial date of the public notice. Following the public review and comment period, the substantive comments will be addressed. The Deputy Regional Environmental Officer will sign the FONSI of the selected alternative. The EA and FONSI will be archived on FEMA's website and one hard copy will be in the town hall and one hard copy will be in the town library.

4.2 FEMA PUBLICATION OF DRAFT ENVIRONMENTAL ASSESSMENT NOTICE AND REQUEST FOR COMMENT

DRAFT

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

MILL RIVER BANK STABILIZATION WHATELY, MASSACHUSETTS HAZARD MITIGATION GRANT PROGRAM - FEMA-4097-DR-MA

Heavy rain in 2011 from Hurricane Irene caused flood flows on the Mill River resulting in bank erosion in the vicinity of the Town of Whately's (The Town) drinking water wells and pumps. Sections of sheet pile that had been placed between the wells and the river for protection became disconnected from each other and began leaning into the Mill River putting the wells in jeopardy of being destroyed by flood waters. The Town applied for assistance under the Hazard Mitigation Grant Program (HMGP) - FEMA-4097-DR-MA which authorizes the Federal Emergency Management Agency (FEMA) to provide hazard mitigation grants to local governments, state agencies and eligible private non-profit organizations in Massachusetts.

The Town is proposing to move the river into a former river meander channel to further the distance between the river and the wells. The Town feels that this is a better long term solution with fewer environmental impacts than continuing to stabilize the river banks with hard armoring.

In accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500-1508) and FEMA regulations for NEPA compliance (44 CFR Part 10), FEMA prepared an Environmental Assessment (EA) to meet their responsibilities under NEPA to fully understand and consider the environmental consequences of actions proposed for federal funding. The purpose of the EA is to analyze potential environmental impacts from the proposed project, and to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). In the EA process, three (3) alternatives were considered: the "No Action Alternative", leaving the well in jeopardy of failing, the "Proposed Action Alternative", channel relocation of the Mill River; adding sheet pile and riprap; adding a rock toe with fabric encapsulated soil lifting above; and moving the wells elsewhere.

FEMA evaluated the proposed project for any potential significant adverse impacts to existing physical resources (air quality, transportation/traffic, aesthetic and visual resources, and historic and cultural resources), natural resources (water resources, floodplains, wildlife, vegetation, threatened and endangered species, and wetlands), socioeconomic resources (economic justice), and cumulative impacts.

These documents are available for viewing online at <http://www.whately.org/> and in person at the Town of Whately Town Hall, located at 218 Chestnut Plain Road, Whately, MA 01093, (413) 665-4400 and The Town Library, located at 202 Chestnut Plain Rd, Whately, MA 01093, (413) 665-2170. The document will also be posted on FEMA's website: <http://www.fema.gov/resource-document-library>.

CONDITIONS

The Town of Whately shall comply with all prescribed conditions set forth in the Biological Opinion provided by formal consultation with the US Fish and Wildlife Service (USFWS) and described in the EA, including, but not

limited to the following conditions. Failure to comply with these conditions may jeopardize the receipt of federal funding.

- Section 02400 Bank Treatment, Section 2.3. Fabric Encapsulated Lift Bank Treatments - fabric shall be 100% biodegradable
- Section 00200 Advertisement for Bid - Project shall be complete no later than November 30, 2015, so no work will be done in the channel or otherwise from April 1 to May 31
- Section 02100 Water Management, Erosion and Pollution Control, Section 1.3 Submittals - the Contractor must submit an in-stream erosion control plan to be approved by the Owner and Engineer; the Contractor must also submit a Spill Prevention Plan for approval prior to work. This spill prevention plan will include measures to refuel away outside of the channel and wetlands, using biodegradable hydraulic fluids, having a spill cleanup kit and all absorbent materials necessary for spills or refueling, and for storing all vehicles outside of the channel and wetlands.
 - Section 3.4.H. Control of Chemical Waste - the Contractor must take special measures to prevent chemicals, fuels, oils, greases, herbicides, and insecticides from entering the drainage ways.

In addition, the project Drawings describe methods to eliminate or minimize downstream siltation. All new channel construction will be completed outside of the actively flowing Mill River with bulk bag check dams preventing water from entering the channel construction area. Once the new channel is constructed, the check dams will be moved to block off the existing channel and allow water through the new channel. While work is being completed in the existing channel (filling with soil and large wood), no actively flowing water will be moving through this work area. Sheet 11 of the drawings describes the details of these check dams as well as a pump discharge sediment

FINDINGS

Based on input and consultation with agencies, identified sources documented in the EA, Town officials, and in accordance with the FEMA regulations for environmental considerations and Executive Orders on Floodplains, Wetlands, and Environmental Justice, FEMA finds that the Proposed Alternative, as defined in the EA, will have no significant impact on the natural or human environment. As a result of this Finding of No Significant Impact, an EIS will not be prepared (44 CFR Part 10.8) and the proposed project with prescribed conditions may proceed. If a change in the scope of work occurs, MEMA and FEMA must be notified to evaluate if the proposed change would alter the potential impacts on the environment. Under most situations, however, the modification or addition of one or more elements of the construction plan will not alter the findings of this EA.

APPROVED:

Lydia Kachadoorian	Date
Deputy Regional Environmental Officer	
FEMA Region I, Mitigation Division	
Environmental & Historic Preservation Office (EHP)	
99 High St., 6 th Floor, Boston, MA 02110	

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6. References

- Biodrawiversity, 2012. Wildlife Habitat Assessment in the Mill River in Whately, Massachusetts, for a Proposed Streambank Stabilization Project. Prepared for Town of Whately. 4 pp.
- CEQ, 2010. Memorandum for Heads of Federal Departments and Agencies. Subject: Draft NEPA guidance on consideration of the effects of climate change and greenhouse gas emissions. Authored by: Nancy H. Sutley, Chair, Council on Environmental Quality, February 18, 2010.
- EO 12898. Executive Order No. 12898. Environmental Justice for Low Income and Minority Populations. 1994. 59 C.F.R. 7629.
- Hasenstab, Robert, and Alan McArdle. *Archaeological Location Survey Of The Whately Municipal Water System, Whately, Massachusetts*. Amherst, Massachusetts: UMass Archaeological Services, 1987. Print.
- Natural Heritage & Endangered Species Program (NHESP), 2007. Creeper *Strophitus undulatus* Fact Sheet. Text contributed by Ethan Nedeau, December 2007, Creeper Fact Sheet.
- Natural Heritage & Endangered Species Program (NHESP), 2009a. Dwarf Wedgemussel *Alasmidonta heterodon* Fact Sheet. Text contributed by Ethan Nedeau, December 2007, Dwarf Wedgemussel Fact Sheet.
- Natural Heritage & Endangered Species Program (NHESP), 2009b. Eastern Pondmussel *Ligumia nasuta* Fact Sheet. Text contributed by Ethan Nedeau, December 2007, Eastern Pondmussel Fact Sheet.
- Natural Heritage & Endangered Species Program (NHESP), 2009c. Winged Monkey-flower *Mimulus alatus* Ait. Fact Sheet.
- U.S. Army Corps of Engineers (USACE), 1994. Hydraulic design of Flood Control Channels; Engineer Manual 1110-2-1601. Washington, D.C.

7. List of Appendices

APPENDIX A MAPS AND FIGURES

- Figure A-1 Site Location Map
- Figure A-2 NHESP Estimated and Priority Habitat
- Figure A-3 Floodplain Insurance Rate Map
- Figure A-4 Wetlands Map

APPENDIX B SITE PHOTOGRAPHS

APPENDIX C DESIGN DRAWINGS

APPENDIX D FEDERAL AGENCY INVOLVEMENT

- Appendix D-1 U.S. Fish & Wildlife Service Biological Opinion (includes USFWS response on the northern long-eared bat)
- Appendix D-2 USACE Section 404 permit (pending)
- Appendix D-3 8-Step for Executive Order 11988 Floodplain Management

APPENDIX E STATE AGENCY INVOLVEMENT

- Appendix E-1 MEPA Final Record of Decision
- Appendix E-2 MassDEP - emergency authorization
- Appendix E-3 NHESP - DRAFT Conservation Management Plan (in final review); Wildlife Habitat Assessment and Rare Species Survey; Biological Assessment for Formal Section 7 Consultation

APPENDIX F ALTERNATIVE ANALYSIS

APPENDIX G FINDINGS OF NO SIGNIFICANT IMPACT (FONSI)