Final Environmental Assessment

Whetstone Brook Floodplain Restoration

Windham County, Brattleboro, Vermont

VRC-DR-4330

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FEMA

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
APE	Area of Potential Effect
ARA	Archaeological Resources Assessment
BMP	Best Management Practice
DEC	Department of Environmental Conservation
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
MMI	Milone & MacBroom Incorporated
LNRP	Landslide Natural Resource Planning
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NRIS	Nation Resources Information Center
ORC	Vermont Online Resource Center
SHPO	State Historic Preservation Office
SMC	Stockbridge-Munsee Community
SRHP	State Register of Historic Places
USACE	U.S. Army Corps of Engineers
VT	Vermont

1.0 INTRODUCTION

The President declared a major disaster under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) on August 16, 2017 for the State of Vermont resulting from Severe Storms and Flooding that occurred June 29 – July 1, 2017. This declaration designated DR-4330-VT authorized the Hazard Mitigation Grant Program statewide. Under the Hazard Mitigation Grant Program (HMGP), the Federal Emergency Management Agency (FEMA) may provide financial assistance for state, local, and tribal governments and certain private nonprofit organizations to implement hazard mitigation measures that are cost effective and substantially reduce the risk of future damage, hardship, loss, or suffering in any area affected by the major disaster. Vermont Emergency Management is the recipient under the HMGP, responsible for submitting HMGP applications on behalf of eligible applicants, the entity to which FEMA awards HMGP funding, and responsible and accountable for the use of HMGP funding.

Vermont Emergency Management submitted to FEMA an HMGP application on behalf of the Vermont River Conservancy. Numerous costly floods have caused repeated damage to downtown Brattleboro, most recently, Tropical Storm Irene in August 2011. The project application includes the removal of an existing berm along Whetstone Brook, excavation of fill to create two floodplain terraces, planting a riparian buffer along the Brook, construction of two public recreation trails, restoration of an alluvial fan at the toe of a tributary and the restoration of a locally significant wetland.

The National Environmental Policy Act (NEPA) requires FEMA to follow a specific planning process to ensure that it has considered, and the general public is fully informed about the consequences of a proposed federal action, such as the approval of a mitigation project under the HMGP grant for a Stafford Act major disaster declaration. To meet its NEPA requirements, FEMA has prepared this Environmental Assessment 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). FEMA has prepared this Environmental Assessment in accordance with NEPA, its implementing regulations, and FEMA and Department of Homeland Security policy.

2.0 PURPOSE AND NEED

The Town of Brattleboro's "All Hazards Mitigation Plan" identifies risks associated with flooding and erosion of Whetstone Brook as a high priority for mitigation (Brattleboro 2015). Additionally, the 2015 Vermont Economic Resiliency Initiative identified conservation of the project site as one of three actions the Town of Brattleboro could implement to reduce flood effects and reoccurring flood damage to town bridges, roads, water and sewer lines, state highways, businesses, and private residences within Brattleboro (VERI 2015).

The purpose of the project is to restore the natural floodplain function, create additional flood storage and improve water quality within the Whetstone Brook watershed upstream of the Town of Brattleboro to reduce localized erosion and inundation and flood damage to properties and public infrastructure adjacent to and downstream of the property. The proposed mitigation project is needed to lessen flood risk to human health, improved property, and public infrastructure.

3.0 PROJECT LOCATION AND BACKGROUND

The Whetstone Brook Floodplain Restoration project is located at 250 Birge Street, Brattleboro, VT. This location lies within the Connecticut River Valley in the southeast corner of Vermont in Windham County and is approximately 1 mile upstream from the confluence with the Connecticut River (Appendix A). Brattleboro is the regional economic center having the 4th highest economic activity in the state, tied with Rutland (VERI 2015). It is also home to important elements of the regional transportation infrastructure, including federal highways 91 and 5, state routes 9 and 30 and the railroad. The project site is a rare open space in an otherwise densely developed environment with residential development being the primary adjacent land use.

The Whetstone Brook Watershed spans the towns of Brattleboro and Marlboro with a small portion of the northern watershed being in Dummerston. The watershed is 27.4 square miles (17,566 acres) and the Whetstone Brook is 13 miles long. Like most of the rest of Vermont, the watershed was primarily forested prior to European settlement. With the introduction of agriculture (originally sheep farming, now dairy) the area was deforested for pasture and crop production (Albers 2000). By the late 1800's the entire state was 75% denuded of trees. Today, much of this watershed has returned to forest land with increasing amounts of land being converted to residential use. Currently, the watershed is approximately 70% forested, 16% developed (including residential, commercial and roads), 7% agriculture, 6% water and 1% wetland (Landslide 2008).

The project site was formerly owned by Cersosimo Lumber Company and was filled for previous uses such as log storage and milling. Sand and gravel fill occupy the floodplain currently, and the filled area does not flood during 100-year flood events on Whetstone Brook which increases flood risks both locally and downstream. The fill on site was found to be contaminated with polyaromatic hydrocarbons (PAHs) from prior industrial uses. However, PAH levels were found to be at acceptable levels for urban soils and could remain on site (VT DEC 2019).

Records indicate a history of flooding in Brattleboro. The National Weather Service mentions Brattleboro in all of Vermont's storms of record, including the 1869 "Freshet," and the 1927, 1938, 1973 and 2011 (Tropical Storm Irene) floods (National Weather Service 2014). Flood elevation measurements taken following Tropical Storm Irene indicate that it was between a 50 and 100-year flood event (Schiff 2012). There is evidence throughout the watershed of channel straightening, dredging and berm construction – practices that, in large part, were repeated following Tropical Storm Irene.

Fifty buildings downstream of the project site were damaged by Tropical Storm Irene: nineteen had major damage and 31 had minor damage (Windham Regional Commission 2011). There are 45 acres of mapped floodplain on the Whetstone Brook downstream of Interstate 91: of those, only 12 are undeveloped.

4.0 ALTERNATIVES

More than ten alternatives were evaluated using a hydraulic model of Whetstone Brook that was created for this project (MMI 2018). Each alternative was evaluated for how well it achieved the following objectives:

- Reduce flood and erosion risk
- Create storage area for flood waters, sediment, large wood, and ice
- Treat local runoff flowing through the floodplain
- Capture nutrients to improve water quality
- Reduce or eliminate maintenance needs, and
- Simplify construction and control project cost

Table 4.0.1 Summary Table of Alternatives Considered

Alternative #	Name	Summary Action
1	No Action	
2	Lower floodplain 2 feet to fence line	Dismissed
3	Lower floodplain 4 feet to fence line	Dismissed
4	Lower floodplain to 2-year flood level and out to toe of slope	Combined with Alternative 5 to become the Proposed Action
5	Lower floodplain to 10-year flood level to toe of slope	Combined with Alternative 4 to become the Proposed Action
6	Lower floodplain to the 25-year flood level to toe of slope	Dismissed
7	Construct floodwall at Art Center	Dismissed
8	Construct flood bench at the Art Center	Dismissed
9	Lower floodplain to 2-year flood level & construct flood bench at Art Center	Dismissed
10	Lower floodplain to 2-year flood level & leave space for park at rear of floodplain	Dismissed

4.1 Alternative 1: No Action Alternative

If no action is taken, the status quo would remain at the project site and downstream where flood waters would not be reconnected with the local floodplain. The adjacent Williams Street and downstream properties would remain at the same level of flood risk.

4.2 Alternative 2: Proposed Action

A hybrid of floodplain restoration alternatives was selected to maximize flood benefits while controlling project costs (MMI 2018). A compound floodplain with a low floodplain at the 2-year flood level next to the river channel and a higher floodplain at the 10-year flood level further from the river are proposed. The Proposed Action is designed to provide a flood elevation reduction of 1.0 to 2.0 feet (MMI 2018). A small area of land would be maintained at existing grade for a parking area. Trails are proposed to allow walking around the edge of the entire site as well as short trails to allow for access to the river.

The proposed action alternative includes the following components (See Appendix B for Existing and Planned Site Conditions):

1. Remove approximately 2,000 linear feet of berm along the Whetstone Brook. Care would be taken to maintain mature trees growing at the base of the berm on the water side. Saplings would be saved to use in revegetation. Existing stone armoring located below ordinary high water would be left in place. The remaining stone would be used in grade control structures in the wetland restoration.
2. Create two floodplain terraces.
    - The lower floodplain, adjacent to the river channel, would be excavated to the two-year flood. The upper floodplain, adjacent to and east of the lower floodplain, would be excavated to the 10-year flood. Approximately 38,000 cubic yards of material would be removed from a total of six acres.
3. Plant a 100-foot-wide vegetated buffer (from river's edge) in the lower floodplain.
4. Construct two north/south public recreation trails.
    - One at the top of the slope between the lower and upper floodplains would be less formal and include side trails that run east/west to provide access to the river at three or four locations.
    - The other trail located between the upper floodplain and the restored wetland, would be a 6-foot wide gravel path built for Americans with Disabilities Act (ADA) compliant access to the site.
5. Restore the alluvial fan at the toe of a tributary (133-acre drainage area) at the south end of the parcel.
    - Clean up debris and spread existing cobble.
6. Restore a locally significant wetland complex that would be protected by the floodplain restoration work.
    - Work with the adjacent landowners to remove trash and debris from the slope above the wetland and plant the slope.
    - Enhance a vernal pool with large wood.
    - Install grade control rock structures.
    - Remove a portion of a berm and wall to create a more natural path for water to flow; and
    - Construct sediment trap near the confluence of the two wetland areas.
7. Remove invasive species:
    - Remove Japanese knotweed and phragmites located in the floodplain restoration area.
8. Keep polycyclic aromatic hydrocarbon (PAH) contaminated soils on site:
    - Over excavate the south end of parcel to accommodate storage of designated urban soils.
    - Three acres of urban soil at the north end of the parcel would be relocated to south end of the parcel where it can remain on site per EPA and Vermont DEC standards
9. Creation of a parking area for five cars:
    - Retain the gravel access drive and a small gravel parking area near entrance using existing material
    - Vegetate around the parking area using native shrubs
    - Install a bike rack, and
    - Install a trash can and dog waste receptacle
10. Utilities
    - Disconnect service and remove utility pole and meter in the middle of the property on riverbank
    - Lower manhole frame at north end near the river
    - Protect water and sewer line crossing the site, and
    - Maintain fire hydrant located near new parking area.

4.3 Alternative 3: Considered and Dismissed

This alternative would lower the floodplain 2 feet from the river to the fence line providing a 0.6 – 1.1-foot decrease in flood elevation. This alternative would provide a consistent cut and a smaller cut which would generate less material for disposal. This alternative would also limit the lateral extent of the cut to primarily open areas and avoid effects to non-riverine wetlands.

4.4 Alternative 4: Considered and Dismissed

This alternative would lower the floodplain 4 feet from the river to the fence line providing a 0.6 to 2.0-foot decrease in flood elevations. This alternative would still provide a consistent cut but a larger cut than the 2-foot option generating more material to dispose. This alternative would also limit the lateral extent of the cut to primarily open areas and avoid effects to non-riverine wetlands.

4.5 Alternative 5: Considered and Dismissed

This alternative would lower the floodplain to the 25-year flood level to toe of slope and provide a 0.5 to 0.7-foot decrease in flood elevations. This alternative would involve a smaller cut generating less material to dispose. This alternative could limit the future use of the back of the site but has less potential to impact non-riverine wetlands. This alternative would not provide any flood elevation reduction for floods less than the 25-year event.

4.6 Alternative 6: Considered and Dismissed

This alternative would construct a floodwall at the Art Center and protect existing buildings against flooding but would result in a potential reduction in flood storage area and may potentially increase flood elevations locally. Additional modeling refinement would be needed, but this alternative was dismissed because it would not provide the same level of flood storage as the Proposed Action.

4.7 Alternative 7: Considered and Dismissed

This alternative would construct a flood bench at the Art Center. This would increase flood storage capacity upstream of the narrow Elliot St Bridge and would reduce the number of vulnerable properties but would require property acquisition. This alternative might reduce flood elevations and increase protection of Williams St, but additional modeling refinement would be needed to confirm. This alternative was dismissed because it wouldn't provide the same level of flood storage as the Proposed Action and would cost more because of the need for property acquisition.

4.8 Alternative 8: Considered and Dismissed

This alternative would lower the floodplain to the 2-year flood level and construct a flood bench at Art Center. This would remove the pinch point affecting flood elevations downstream of the Cersosimo floodplain lowering flood elevations 2.4 feet. This would likely move the pinch point downstream to the Elliot Street Bridge, but additional modeling would be needed to confirm the effects of this alternative.

4.9 Alternative 9: Considered and Dismissed

This alternative would lower the floodplain to the 2-year flood level and leave space for a park at the back of the floodplain. This alternative would locally decrease flood elevations 0.7 to 2.0 feet. This alternative would require a moderate cut generating more material to dispose of than some of the other alternatives and would limit the lateral extent of the cut to primarily open areas. This alternative would have less potential to impact non-riverine wetlands and space would remain at the back of the floodplain for future park use.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL EFFECTS

Effects are changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action or alternatives and may include effects that are later in time or farther removed in distance from the proposed action or alternatives. Effects include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct or indirect. Effects may also include those resulting from actions which may be have both beneficial and detrimental effects, even if the agency believes that the overall effect would be beneficial (40 CFR 1508.1(g)).

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 5.0.1:

Table 5.0.1: 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	Changes 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	Changes 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	Changes 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.

Not all effect topics are applicable to either the No Action Alternative or the Proposed Action Alternative. Table 5.0.2 below lists the resources that have been eliminated from the EA with reasoning.

Table 5.0.2: Topics Eliminated with Reasoning

Resource Topic	Reason
Wild and Scenic Rivers Act	The project site is not near a wild and scenic river or scenic byway or highway.
Safe Drinking Water Act	Project site is not located above a sole source aquifer nor would it impact one.
Coastal Zone Management Act	There are no coastal communities in the state of Vermont.
Coastal Barrier Resources Act	There are no Coastal Barrier Resource Units or Otherwise Protected Areas in the state of Vermont.
Magnuson-Stevens Fishery Conservation and Management Act	There is no Essential Fish Habitat designated in the state of Vermont.
Golden Eagles from Bald and Golden Eagle Protection Act	There are no known Golden Eagles in the state of Vermont

5.1 PHYSICAL RESOURCES

5.1.1 Geology and Soils

5.1.1.1 Existing Conditions

The Whetstone Brook Watershed is in the Connecticut River Valley of Vermont in the southernmost area of the Southern Vermont Piedmont bio-physical region. The Southern Vermont Piedmont is defined by the rolling foothills east of the main Green Mountains. Post glaciation, most of the igneous and sedimentary rock has been eroded away, leaving bedrock dominated by a "mixture of limestone, schist, and granite" (Johnson 1980). Whetstone Brook has seven locations along the main stem where soils have been scoured down to bedrock which prevents further bed erosion, i.e., natural grade controls (LNRP 2008).

The main stem of the Whetstone Brook drops 1600 feet over 13 miles (2.3% overall channel slope) with 1,220 feet of that drop occurring in the uppermost 5.6 miles. The grade flattens out quite dramatically east of here. The main tributaries of Whetstone Brook experience similar changes in grade (LNRP 2008).

Soils at the project site are 79% Podunk Fine Sandy Loam with Quonset and Warwick accounting for the remainder. Podunk soils are considered prime soils for agriculture if protected from flooding. Quonset and Warwick are statewide prime soils and are in the wetland portion of this parcel. The soils are mapped on the USGS Topo Map as located in developed area. Additionally, approximately 4 acres of soil in the northern part of the parcel have been impacted by polycyclic aromatic hydrocarbons (PAH). Please refer to the section on Hazardous Materials and Public Health for an in-depth discussion of the effects from PAH impacted soils.

5.1.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Geology and soils would remain in current condition.

Alternative 2: Proposed Action

The Proposed Action Alternative would involve ground disturbance on nearly all 12 acres of the property and remove 38,200 cubic yards of historic sand and gravel fill and would return this site to a condition that resembles more the pre-industrial condition of the property. During the scoping process, coordination with the Natural Resource Conservation Service determined that the Proposed Action would not affect either prime soils or farmland of statewide importance because the land would not be converted to a use that would preclude current or future agricultural use, e.g., buildings or paved parking lots (NRCS 2020). During construction, sediment control structures (silt fence, straw bales, etc.) would be installed to reduce soil erosion and the movement of sediment into the river and all disturbed areas would be replanted to prevent soil erosion. Effects to soils would be **moderate** and effects to geology would be **negligible**.

5.1.2 Air Quality

The Clean Air Act is a federal law that regulates air emissions from area, stationary, and mobile sources. Air quality standards have been enacted to protect public health and the environment: the standards include lead, nitrogen dioxide, ozone, carbon monoxide, sulfur dioxide, and particulate matter. Areas where the monitored concentration of a pollutant exceeds air quality standards are designated as "non-attainment areas." Areas where all pollutants are below the standards are classified as in "attainment areas."

Climate Change refers to changes in Earth's climate caused by a general warming of the atmosphere caused by greenhouse gases, which are emitted by both natural processes and human activities. Greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxides, and other compounds. The accumulation of greenhouse gases in the

atmosphere, and the resulting increase in temperature is capable of affecting species distribution, temperature fluctuations, sea level dynamics and weather patterns.

5.1.2.1 Existing Conditions

The proposed project area is located within an attainment area and pollutants in the air do not exceed any air quality standards.

Climate change has affected the entire state of Vermont, resulting in more frequent and more severe storms including Brattleboro and the project site (VTANR 2011 and 2020).

5.1.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no construction project and no construction equipment giving off emissions. Effects to air quality and Climate Change would be **none**.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, temporary emissions would be expected from construction equipment during construction activities. Some of these emissions would include greenhouse gases. Ultra-low sulfur diesel fuel would be used, as required by the Clean Air Non-Road Diesel Rule (EPA 2012). Emissions would be below the de minimis levels. Construction activity would be temporary and, by adhering to Best Management Practices (BMPs), effects to air quality would be **minor** and effects to Climate Change would be **negligible.**

5.2 WATER RESOURCES

5.2.1 Water Quality

The Clean Water Act regulates discharge of pollutants into water with sections falling under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and the 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. Under the National Pollutant Discharge Elimination System (NPDES), the EPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff. Activities that disturb one acre of ground or more are required to apply for an NPDES permit, through the VT Department of Environmental Conservation as authorized by 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 Whetstone Brook is a tributary of the Connecticut River and is regulated by the USACE under the Clean Water Act. The entire Whetstone Brook Watershed is mapped as a "Brook Trout Water-Mixed Wild Trout" (VT ANR Atlas 2020). The Town is served by a community drinking water system and there are five mapped wells in the watershed east of I-91 (VT ANR Atlas 2020). The project area is not located within an aquifer recharge area (VT ANR Atlas 2020).

5.2.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action alternative would maintain the status quo. Although there would not be any additional effects to water quality, high flows without access to a floodplain would continue to suspend and transport fine sediments downstream rather than let them settle onto the floodplain. Effects would be **minor**.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, the construction effects would require the project proponent to get a CWA 404 permit from USACE, and the following permits from the Vermont Department of Environmental Conservation: a CWA 401 Water Quality Certificate, a CWA 402 Stormwater Construction Permit, and a Stream Alteration Permit. All proposed work would be performed out of the active flowing water during low flow periods thereby minimizing effects to water quality. Work that could not be performed out of the active flowing water may be subject to an In-Water Work Window that runs from July 1 through September 30 of any given year. The existing stone armoring located below the ordinary high water mark would be left in place to limit effects to the stream and the remaining stone above the ordinary high water mark would be used as grade control structures in the wetland restoration. Permits would also include requirements to control work in water and the use of sediment and erosion control Best Management Practices (BMPs), including but not limited to, always maintaining an emergency management plan and a spill kit on the site and a stormwater management plan (Brattleboro 2018c).

Long-term effects to water quality would be beneficial from reconnecting Whetstone Brook to the floodplain from the removal of the berm and the creation of a functioning floodplain. Access to the floodplain during flood flows would slow water velocity resulting in less erosion and sediment transport downstream; slower flows would also allow fine sediments to settle out providing natural water clarification. Minimizing the removal of mature trees along the river's edge and the planting and natural succession of the riparian floodplain forest would provide shade which would help to moderate water temperatures. A mature riparian floodplain forest would also add nutrients to the stream from terrestrial sources and would also provide large woody debris to the system making the stream more complex, slowing flows and providing habitat, all which would contribute to the overall general ecological health of Whetstone Brook. The efficiency of these processes would increase as the vegetated buffer matures over time. Effects to water quality 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 analysis (Appendix C) to evaluate potential effects on, and mitigate effects to, floodplains in compliance with EO 11988 and 44 C.F.R. Part 9. The Vermont Agency of Natural Resources, Department of Environmental Conservation administers and regulates floodplains within Vermont in accordance with the National Flood Insurance Act and the National Flood Insurance Program.

5.2.2.1 Existing Conditions

Per the FEMA Flood Insurance Rate Map (FIRM Panel: 50025C_222 Map Effective Date: Sep 27, 2007), the proposed project is located within a Regulatory Floodway and a Special Flood Hazard Area (100-year floodplain – Zone AE) and Zone Shaded-X (Appendix A). The Whetstone Brook watershed is 27.4 square miles (17,566 acres) and the Whetstone Brook is 13 miles long. The project site was filled for previous uses such as log storage and milling. Sand and gravel fill occupy the floodplain currently, and the filled area does not flood during 100-year flood events on Whetstone Brook.

5.2.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, flood storage would remain limited and the project site and downstream private property and public infrastructure along the river would maintain their current level of flood risk. Effects to the floodplain would be **minor.**

Alternative 2: Proposed Action

Construction activities for the Proposed Action would occur within and adjacent to the floodplain and regulatory floodway. Under the Proposed Action, 38,200 cubic yards of historic fill would be removed from the floodplain creating additional flood storage and reduce flood elevations 1.0 to 2.0 feet (MMI 2018). The new floodplain would reduce flood velocities and capture sediment, large woody debris, and ice during floods; flood debris can lead to jams at downstream bridges and narrow spots between buildings rapidly elevating floodwaters. The proposed parking area would be outside of the SFHA (Brattleboro DRB 2018). All these factors combined would equate to a lower flood risk at the project site and downstream.

Long-term effects to water quality would be beneficial from reconnecting Whetstone Brook to the floodplain from the removal of the berm and the creation of a functioning floodplain. Access to the floodplain during flood flows would slow water velocity resulting in less erosion and sediment transport downstream; slower flows would also allow fine sediments to settle out providing natural water clarification. Minimizing the removal of mature trees along the river's edge and the planting and natural succession of the riparian floodplain forest would provide structure to the riverbank and provide shade. A mature riparian floodplain forest would also add nutrients to the stream from terrestrial sources and would also provide large woody debris to the system making the stream more complex, slowing flows, and providing habitat, all which would contribute to the overall general ecological health of Whetstone Brook. The efficiency of these processes would increase as the vegetated buffer matures over time.

The Brattleboro Design Review Board approved the project proposal and issued a Zoning Permit on August 30, 2018; this permit includes floodplain consideration (Brattleboro DRB 2018 and Brattleboro 2018c). State level review would take place through the ACT 250 process and documentation of this review would be required to be submitted to FEMA. FEMA would also require a certificate demonstrating "no rise" of the base flood elevation anywhere within the community in conformance with 44 C.F.R. Parts 9 and 60. Additionally, the grant would be conditioned for the above permits and documents. Potential adverse effects would be minimized as long as all permit and grant conditions are adhered to (44 C.F.R. 9.11(d)(5)) including, but not limited to, BMPs such as developing a flood contingency and emergency action plan and maintaining copies of each at the construction site (MMI 2020).

Post construction, the Project proponent should apply to FEMA for a Letter of [Flood] Map Revision to accurately capture the new flood elevations and flood risk to the community per 44 C.F.R. Part 65. Effects to the floodplain would be **moderate**.

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 analysis to evaluate potential effects on, and mitigate effects to, wetlands in compliance with EO 11990 and 44 C.F.R. Part 9. The Vermont Agency of Natural Resources, Department of Environmental Conservation, administers and regulates wetlands in Vermont.

5.2.3.1 Existing Conditions

Historic alterations of the flow across the site have created a wetland along the eastern side of the property. A wetland delineation was completed, field checked and accepted by the Vermont Wetlands Program on 11/7/2019; the wetland was classified as a Class II wetland under the Vermont Wetland Rules (VT DEC 2019a). Additionally, the U.S. Fish and Wildlife Service National Wetland Inventory identifies Whetstone Brook as a riverine wetland (Cowardin classification code R3UBH - riverine, upper perennial, unconsolidated bottom and permanently flooded), but this

classification does not require the wetland 8-step analysis under EO 11990, as it is not classified as wetlands per Section 7(c) of the EO (USFWS 2021).

5.2.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would maintain the status quo and result in the no changes or effects to the Whetstone Brook or the Class II wetland. Effects would be **none.**

Alternative 2: Proposed Action

Under the Proposed Action, any restoration work within the Class II wetland buffer would require written approval from the Vermont wetlands program and other activities may require a state wetland permit (VT DEC 2019a). The Vermont Wetlands Program assigned this project #2017-215 for tracking purposes. Adverse effects to wetlands would be minimized through permit conditions and BMPs. The Proposed Action would require a 50-foot buffer around all wetland areas. All stockpile and staging areas would be flagged and located away from wetlands and waterways. Existing trash and litter would be cleaned out of the wetlands. Stone armoring removed from above the ordinary high water mark of Whetstone Brook would be used in grade control structures during the wetland restoration. Large woody debris would be added to the vernal pools to create additional habitat. The beneficial effects of restoring the upland wetland on site would include improved habitat, water filtration and act as a contaminate sink for the neighborhood before rainwater and snow melt enters Whetstone Brook. Effects would be **moderate**.

5.3 BIOLOGICAL RESOURCES

5.3.1 Terrestrial and Avian Wildlife

5.3.1.1 Existing Conditions

Wildlife in the area ranges from interior forest species, riparian and aquatic species to species that are adapted to live in developed areas alongside of humans. There is one species of bat and thirteen migratory birds identified by the USFWS online Information for Planning and Consultation tool (IPaC) as potentially affected by activities in this location (USFWS 2021):

- northern long-eared bat (*Myotis septentrionalis)* – ESA-Listed Threatened
- Bald Eagle *(Haliaeetus leucocephalus)*
- Black-billed Cuckoo (*Coccyzus erythropthalmus*)
- Bobolink (*Dolichonyz oryzivorus*)
- Canada Warbler (*Cardellina canadensis)*
- Dunlin (*Calidris alpine arcticola)*
- Evening Grosbeak (*Coccothraustes vespertinus)*
- Lesser Yellowlegs (*Tringa flavipes)*
- Prairie Warbler (*Dendroica discolor)*
- Rusty Blackbird *(Euphagus carolinus)*
- Semipalmated Sandpiper *(Calidris pusilla)*
- Short-billed Dowitcher *(Limnodromus griseus)*
- Snowy Owl *(Bubo scandiacus)*
- Wood Thrush *(Hylocichla musterlina)*

There are habitat blocks identified northwest of the project site (north of Route 9 and east of I-91) and southwest of the project site (west of I-91). The northern block includes a significant natural community – dry hemlock oak as well as an uncommon vertebrate animal species (ANR 2021).

5.3.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would maintain the status quo: poor-to-nonfunctioning floodplain provides uniform and poor habitat for terrestrial and avian wildlife. The effect would be **none**.

Alternative 2: Proposed Action

Under the Proposed Action, restoring the area to a functional floodplain and wetland complex and planting native species and a riparian floodplain forest/buffer would immediately improve the current habitat for terrestrial and avian wildlife. As natural succession occurs, the habitat would become more diverse and increase in quality over time. The effect would be **moderate.**

5.3.2 Fish and Aquatic Organisms

5.3.2.1 Existing Conditions

This reach of the Whetstone Brook has been straightened and bermed and is heavily influenced by stormwater inputs (LNRP, 2008). It is listed on the VT ANR Atlas as a 'Brook Trout Water - Mixed Wild Trout' area, though limited current data is available (VTANR 2021b). No aquatic species of concern were identified using IPaC (USFWS 2021).

5.3.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would maintain this section of the brook constricted by a berm and without a functioning floodplain. Flood flows would continue to scour the channel and limit habitat diversity. Fish and other aquatic organisms would not have a refuge from high flows. Over time, stream dynamics would seek to stabilize and could erode vertically until the streambanks collapse. Although natural stream dynamics could provide a possible long-term reclamation of natural floodplain function and improved in-stream habitat, this process would take years if not decades to stabilize and achieve the desired results. Short-term effects would be **negligible**; long-term effects would be **minor**.

Alternative 2: Proposed Action

Removing the berm and providing access to a functioning floodplain would mitigate the effects of high flow events on aquatic organisms because floodplains are the primary refuge for fish species during high-flow flood events (Ross & Baker 1983 and Schwartz & Herricks 2005). Access to the floodplain would also provide access to additional food sources. Minimizing the removal of mature trees along the river's edge and the planting and natural succession of the riparian floodplain forest would provide shade which would moderate water temperatures providing thermal refuge for fish and aquatic organisms. A mature riparian floodplain forest would also add nutrients to the stream from terrestrial sources supporting insects and aquatic organism populations that support higher order fish species. Riparian forests would also provide large woody debris to the system making the stream more complex, slowing flows and providing habitat, all which would contribute to the overall general ecological health of Whetstone Brook. Effects to fish and aquatic organisms would be **moderate**.

5.3.3 Vegetation and Exotic/Invasive Species

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. Invasive species prefer disturbed habitats and generally possess high dispersal abilities, enabling them to out-compete native species.

5.3.3.1 Existing Conditions

Vegetation in the project area is primarily native species reestablishing after long-term industrial use at the site. There are no mapped natural communities identified on the site (VTANR 2021b). Known invasive species identified at the project site are Japanese Knotweed (*Fallopia japonica)* and Phragmites (common reed) (*Phragmites australis).*

Although located along the Whetstone Brook and undeveloped, the site has a long history of industrial use and much of it is covered with nonnative soils (fill) brought to the site to accommodate those industrial uses. Since industrial use has ended, the site has not been managed and is in early stages of forest succession.

5.3.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the no Action Alternative, no invasive species would be removed from the project site. Soils would remain poor and less suitable for native species allowing invasive species to out compete native species. Natural forest succession would occur at a slow rate limiting the benefit of the existing riparian vegetation. The effect would be **minor**.

Alternative 2: Proposed Action

The Proposed Action would preserve the existing large trees along river and plant additional shade trees along the rivers' edge; establish a 100-foot riparian zone with native trees, shrubs and a wet meadow seed mix; install a row of willow and dogwood fascines (structural bundle of branches) at the edge of the restored floodplain to stabilize soils; restore the scrub/shrub wet meadow areas by planting trees, shrubs and a VT wetland-shrub seed mix; plant trees and shrubs along the walking paths to provide shade; plant native shrubs around the parking area and plant all disturbed areas from construction with a conservation seed mix. Brattleboro Zoning Permit would require that all dead or dying landscaping vegetation must be replaced within one planting season using the same or similar species (Brattleboro 2018c).

Table 5.3.1: Tree and Shrub Plant List

Trees	Shrubs
silver maple (*Acer saccharinum*)	red osier dogwood (*Cornus sericea)*
sugar maple (*Acer saccharum*)	silky dogwood (*Cornus amonmum)*
red maple (*Acer rubrum)*	shrub willow (*Salix spp.)*
red oak (*Quercus rubra)*	buttonbush (*Cephalanthus occidentalis)*
eastern hemlock (*Tsuga canadensis)*	spirea (*Spirea douglasii)*
American sycamore (*Platanus occidentalis)*	bog birch (*Betula pumila)*
American elm (*Ulmus americana)*	common winterberry (*Ilex verticillate)*
yellow birch (*Betula alleghaniensis)*	highbush bluebery (*Vaccinium corymbosum)*
speckled alder (*Alnus incana)*	black elderberry (*Sambucus nigra)*

Restoring the riparian buffer, establishing floodplain forest, and removing populations of invasive species would expedite and improve the restoration of natural conditions.

Table 5.3.2: Native Planting Seed Mixes

Mix	Composition
Vermont Conservation Grass Seed Mix	35% red fescue, 25% tall fescue, 15% annual ryegrass, 12% perennial ryegrass, 10% Kentucky bluegrass, 3% white clover
Wet Meadow Seed Mix	switchgrass (*Panicum virgatum*), Virginia wild rye (*Elymus virginicus*), red fescue (*Festuca rubra*), fox sedge (*Carex vulpinoidea*), woolgrass (*Scirpus cyperinus*), green bulrush (*Scirpus atrovirens*), nodding bur-marigold (*Bidens cernua*), boneset (*Eupatorium perfoliatum*), Joe-pye weed (*Eupatoriadelphus maculatus*), soft rush (*Juncus effusus*), sensitive fern (*Onoclea sensibilis*), blue vervain (*Verbena hastata*), New England aster (*Symphyotrichum nova-angliaea*)
Vermont Wetland Shrub Mix	blue vervain (*Verbena hastata*), Joe-pye weed (*Eupatoriadelphus maculatus*), green bulrush (*Scirpus atrovirens*), nodding sedge (*Carex crinita*), buttonbush (*Cephalanthus occidentalis*), red-osier dogwood (*Cornus sericea*), elderberry (*Sambucus conadensis*), nodding bur-marigold (*Bidens cernua*), greater bladder sedge (*Carex intumescens*)

The proposed design plans would require the prevention of potential transport of invasive species to and from the work site or spreading within the work site. All equipment would be required to be inspected and cleaned prior to transporting to the construction site. Specific guidelines for the handling of invasive species can be found on Sheet SP3 of the design plans (MMI 2020). The effect would be **moderate.**

5.3.4 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 agency for implementing the ESA in Vermont is the U.S. Fish and Wildlife Service (USFWS). 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 C.F.R. § 10.12) as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities."

5.3.4.1 Existing Conditions

The only federally protected species in the project area is the threatened northern long-eared bat (*Myotis septentrionalis*) according to the USFWS's species mapper, "IPaC". Suitable roosting habitat for the bat consists of trees larger than 3 inches Diameter at Breast Height that exhibit cracks, crevices, holes, exfoliating bark. Riparian zones and hedge rows can also serve as travel corridors for this species. Critical habitat has not been designated for the species (USFWS 2021).

5.3.4.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the status quo would remain. There would be no construction-related tree removal activities and the project site would remain poor habitat for northern long-eared bat. Effects would be **none.**

Alternative 2: Proposed Action

Under the Proposed Action Alternative, tree removal activities would affect the ESA-listed northern long-eared bat. There would be limited tree removal along the river to maintain as much riparian vegetation as possible, but elsewhere on the property the proposal would cut over 6 acres of mostly immature trees and shrubs to remove the historic fill. There is not an exact count for the number of trees that would be cut, but many of the trees in the fill area are less than 3 inches diameter at breast height. The Proposed Action would plant a new riparian buffer which would mature and may serve as habitat in future.

FEMA coordinated with VT Department of Fish and Wildlife November 24, 2020 through January 13, 2021 and it was determined that there are no records of northern long-eared bat summer or winter roosts within a mile of the project site. Northern long-eared bats have been acoustically detected in nearby Vernon, VT. In Vermont, the tree clearing threshold for concern within the northern long-eared bat range is 1% of the forested habitat within a mile of the site. In this case, landcover analysis revealed 745 acres forested, so the threshold would be about 7.5 acres. Any amount of tree clearing below 7.5 acres would not trigger a need for any restrictions or surveys related to bats (VT DF&W 2021).

FEMA initiated consultation for northern long-eared bat with USFWS on March 12, 2021 using the optional streamlined consultation framework for northern long-eared bat under the ESA's 4(d) rule. Per the consultation framework, FEMA was able to assume USFWS concurrence after 30 days on April 12, 2021 (USFWS 2021). Effects to ESA-listed species would be **minor**.

5.3.5 Migratory Birds and Bald Eagles

The Migratory Bird Treaty Act of 1918 provides a program for the conservation of migratory birds that fly through lands of the United States. The lead Federal agency responsible for implementing the Migratory Bird Treaty Act is the USFWS. The law makes it unlawful at any time, by any means or in any manner to take any part, nest, or egg of migratory birds. "Take" is defined in regulation (50 C.F.R. 10.12) as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities."

The Bald and Golden Eagle Protection Act, enacted in 1940, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" Bald and Golden Eagles, including their parts, nests, or eggs. Like the MBTA, the law makes it illegal for anyone to "take," possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or their parts, feathers, nests, or eggs. "Take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities. There are no Golden Eagles in Vermont.

5.3.5.1 Existing Conditions

All of Vermont is in the Atlantic Flyway, an important travel corridor for birds as they migrate north for summer and south for the winter. The Atlantic Flyway encompasses the eastern states and connects northern Canada to South America. It is the most developed of the four flyways in the United States making undeveloped areas along the route where birds can rest and live important to their survival (Ducks Unlimited 2020). Of the migratory bird species identified in IPaC, there was only one species occurrence found on E-Bird. This was an occurrence of a Wood Thrush *(Hylocichla musterlina)* near the project site but not at it (E-bird, 2021).

There are no known Bald Eagle nesting sites in the project area and perch habitat does not exist, however, this does not preclude the possibility of unknown nests or new nests in the project area. There are several sightings of Bald Eagle in the vicinity of the project (E-bird, 2021).

5.3.5.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the current undeveloped, open site would continue to provide poor habitat potential for migratory birds and Bald Eagles. The effect would be **none.**

Alternative 2: Proposed Action

Under the Proposed Action, habitat for migratory birds would be improved through the restoration of the riparian buffer, floodplain forest and the adjacent Class II wetland. The initial plantings for the restoration would immediately improve habitat opportunities for species and this habitat potential would only improve as the plantings mature and habitat diversifies through natural succession. The effect to Migratory Birds would be **moderate.**

Under the Proposed Action Alternative, site preparation, tree clearing work and construction activities could cause temporary disturbance to Bald Eagle behavior if any were in the area. Bald Eagle behavior would return to normal post construction. Restoration of the floodplain forest and riparian buffer would improve Bald Eagle habitat over time. No coordination or consultation would be required with USFWS because there are no Bald Eagle nests at or near the project site. Long-term effects to Bald Eagle would be **minor**.

5.4 CULTURAL RESOURCES

As a federal agency, FEMA must consider the potential effects of its actions upon cultural resources prior to engaging in any project. 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. There are several laws a federal agency must consider when working with and identifying cultural resources. For the Whetstone Brook Flood Restoration Project, FEMA will meet this obligation through its Section 106 of the National Historic Preservation Act of 1966 (NHPA) consultation. Section 106 of the NHPA, as amended and implemented by 36 CFR Part 800, outlines the required process for federal agencies to consider a project's effects to historic properties. 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 use its NHPA review to fulfill its NEPA obligations.

Cultural resources determined to be potentially significant under the NHPA are subject to a higher level of review and federal agencies must consider the potential 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 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. The State of Vermont Division of Historic Preservation, which is the State Historic Preservation Officer (SHPO), maintains a database of Vermont's historic properties, the Vermont Online Resource Center (ORC). FEMA uses this database, along with the NRHP National Resources Information Service (NRIS), as part of its efforts to identify significant cultural resources that may be impacted by a project.

5.4.1 Identification of APE, Historic Context and Consultation Process

Area of Potential Effects

Pursuant to 36 CFR 800.4(a)(1), the Area of Potential Effects (APE) is defined as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. Within the APE, impacts to cultural resources are evaluated prior to the undertaking for both Standing Structures (above ground resources) and Archaeology (below ground resources). The APE for this undertaking consists of the footprint of ground disturbance along the Sawdust Alley parcel and the adjacent areas from where there may be visual impacts. Most of the work would take place below or at grade. Equipment and material staging areas would be confined to existing paved roadway surfaces (Birge Street) and the area where the soil would be removed to create the flood storage. The surrounding area is wooded along both sides of the river and most of the existing tree line would be maintained. Visual impacts are anticipated to be minor and confined to the adjacent streets from where tree removal or new plantings would be visible: Williams Street/Brannen Street to the north, west, and east, and Bridge Street, Reynolds Drive, and Baker Street to the south.

History of the Project Area

Prior to European colonization, the Abenaki occupied much of the present-day New England region including east from Lake Champlain throughout Vermont, New Hampshire, and Maine, and north into Canada. Upon arrival of Europeans in the seventeenth century, many of the Abenaki fled north to present-day Canada after continued conflict with colonizers, eventually siding with the French in multiple conflicts during the Anglo-French wars. Their numbers were greatly reduced by conflict, disease, and dispossession; it is estimated that the Abenaki population in present-day Vermont was reduced to less than 1,000 individuals by the start of the American Revolution and further reduced after Vermont acquired statehood.

The Town of Brattleboro arose in the aftermath of British colonization and the construction of nearby Fort Dummer, which was established along the Connecticut River in 1724 approximately 1.5 miles southeast of the project area. The Fort was built by the English to aid their settlement goals and to act as a deterrent against the French and local Native Americans. The region's abundant waterpower, agricultural potential and location along the Connecticut River and two major confluences, Whetstone Brook and West River, as well as the proximity to overland trade routes all combined to make Brattleboro an ideal location for establishing a town. British settlement ensued rapidly following the end of the French and Indian War in 1760.

The Project Area was once part of the original Frost family estate and was purchased in the early-nineteenth century by John Birge, for whom Birge Street is named. John Birge was a watch maker and jeweler by trade, and a partner in the 19th-century jewelry firm Birge, Brackett and Co., once located in downtown Brattleboro. He also invested in property and industry and aside from the jewelry shop, Birge partnered with Zelotes Dickinson, a Massachusetts native and prominent figure in local business, to establish a mercantile shop and mill business. Dickinson and Birge's shop was in downtown Brattleboro during the 1830s, and together they operated and leased a woolen mill on Birge Street that was originally built by Birge.

The mill pond, canal, and dam within the Project Area originated with Birge's first woolen mill but were subject to subsequent remodeling and rebuilding throughout the nineteenth and early twentieth centuries in association with various incarnations of the mill industries that developed in this location. Birge's original mill building burned down in 1843, and after the fire, Birge and Dickinson leased the property, which included the mill pond, canal, dam, and other features, to various investors. The main mill building was rebuilt during the 1840s and 1850s and is still standing just outside the current project area along with a dwelling that may have been the original mill office. Today the mill building serves as an apartment complex and the former office is now a residence.

An 1845 lease between Birge, Dickinson, Ripley and Clark describes the mill property and mentions a dam, tailrace, and canal within the Project Area. Remnants of these original water works remain in the Project Area. In addition to the woolen factory, the lease also mentions a brick factory that was likely located outside the project area near the woolen factory. Birge eventually sold the woolen mill including the mill pond, canal, and project area, in the mid-1850s. The woolen mill was sold again to Henry Fletcher who transformed it into a sawmill and box factory, known as the Fletcher Mill.

When Henry Fletcher died in 1886 his estate was divided by his heirs who eventually sold the property, and by 1901 the project area lands were owned by L. E. Holden and J. L. Martin. Holden and Martin built a new sawmill and lumber company west of Fletcher's sawmill within the northern portion of the project area. The mill was owned by Holden and Martin through the 1950s until it was purchased by the Brattleboro Dry Kiln and Milling Company, later renamed the Cersosimo Lumber Company. The late-nineteenth and twentieth century artifacts found within the Project Area are likely associated with the tenement houses in the area.

Existing Conditions

The 12.5 acre vacant parcel that forms the project area, commonly known as Sawdust Alley, was once part of an industrial landscape and housed various phases of nineteenth and twentieth century water powered industries including: components of an early woolen mill owned by John Birge; a circa mid-nineteenth century icehouse; the late-nineteenth century H. Fletcher Saw Mill and Box Factory; the early-twentieth century Holden and Martin Sawmill; and the later-twentieth century Cersosimo Lumber Company. As such, according to the archaeological surveys conducted as part of this project, the entire Project Area, including the four (4) Historic Resources (HR), HR 1-4, were designated as components of site VT-WD-0372, a pre-contact and historic archaeological site.

Consultation

An Archaeological Resource Assessment (ARA) was conducted on the Project Area in 2018 and a subsequent Phase I Survey and partial Phase II Site Evaluation in 2019. The combined results of the ARA, Phase I, and partial Phase II led to the identification of archaeological site VT-WD-0372, including HR1-4.

On April 29, 2021, FEMA submitted a consultation letter to the SHPO's office recommending a Phase II Evaluation on HR 4 to assist in determining whether the resource is eligible for listing in the NRHP and to determine the horizontal and vertical extent of the site. FEMA also recommended low-level drone photography to fully document the features within HR 1 and the overall interconnectedness of the industrial landscape within the Project Area. On April 30, 2021, the SHPO's office concurred with this recommendation. The results of the Phase II Survey were received by FEMA on August 24, 2021. In October of 2021, additional information was provided by the archaeological consultant regarding the potential NRHP eligibility of the site. On November 16, 2021, FEMA submitted with the results of the completed survey along with an Adverse Effect finding to the SHPO and the Advisory Council on Historic Preservation (ACHP). FEMA received concurrence from the SHPO's office on December 17, 2021 and received concurrence from the ACHP on November 30, 2021. Opportunities for public comment would be provided during the development of treatment measures to include an educational interpretative panel explaining the precontact and industrial history and significance of the site. A Data Recovery Plan for the archaeological resources within the Project Area would also be developed with FEMA, the SHPO, the Vermont River Conservancy, and other interested parties.

5.4.2 Historic Standing Structures

5.4.2.1 Existing Conditions

There are no previously identified historic resources within the Project Area as the site has been cleared of all buildings. There are historic resources located approximately a quarter mile south of the project area including the Estey Organ Company Factory Historic District, which is located on Birge Street. FEMA has determined that the Project Area is part of a larger area along Whetstone Brook that is significant for its industrial history. This area is eligible for listing in the NRHP as a historic district.

5.4.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

If no action is taken, the level of impact would remain the same at the project site and downstream where flood waters would not be reconnected with the local floodplain (minor impacts). The adjacent residential and commercial properties south along Birge Street and north along Williams Street, as well as downstream properties, would remain at the same level of flood risk, potentially damaging historic properties in Brattleboro if no action is taken. Effects would be **none**.

Alternative 2: Proposed Action

If the floodplain is restored, the flood risk to adjacent residential and commercial properties along Birge Street, Williams Street, and downstream of the project would be eliminated. Therefore, historic resources in Brattleboro would be protected through restoration of the floodplain. Effects would be **minor**.

5.4.3 Archaeological Resources

5.4.3.1 Existing Conditions

The ORC did not include any previously identified archeological resources within the Project Area. However, based on the industrial history of the area, it was determined that the area was potentially sensitive for archaeological resources, and an Archaeological Resource Assessment (ARA) was completed for the area to identify any previously unknown archaeological resources. Based on the results of the ARA, a Phase 1 Archaeological Survey, and ultimately a Phase 2 Archaeological Survey were conducted within the Project Area. The archaeological surveys identified both historic and precontact resources within the project area, which have been designated as archaeological site VT-WD-0372 which includes four (4) Historic Resources (HR), HR1-4. FEMA has determined that this site is eligible for listing in the NRHP.

5.4.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

If no action is taken, the level of impact would remain the same at the project site and downstream where flood waters would not be reconnected with the local floodplain. The archaeological resources within the project area, which are currently protected underneath the gravel fill, would remain in place and undisturbed. Effects would be **none**.

Alternative 2: Proposed Action

Based on the results of the archaeological surveys completed for this project, FEMA has determined that the project would adversely affect the NRHP-eligible historic district and archaeological resources within the Project Area. A portion of earthen berm and concrete wall within HR 1 would be removed, altering the character defining features of an element that contributes to the overall significance of the industrial landscape and Site VT-WD-0372. The overlying fill deposits that currently overlay HR 4 would be removed, potentially exposing the resource, and making it vulnerable to future damage from flooding events. There would be no direct impacts to HR 2 and HR 3 as no work is proposed at these locations. FEMA proposes the use of treatment measures to mitigate the potential Adverse Effect to these resources. These include the following: Public Interpretation - development of an educational interpretative panel explaining the precontact and industrial history and significance of the site; and Data Recovery Plan - prior to project implementation, FEMA would work with the SHPO, the Vermont River Conservancy, and other interested parties to develop a monitoring and data recovery plan for any NRHP eligible archaeological resources within the APE. Effects would be **moderate**.

5.5 SOCIOECONOMIC RESOURCES

5.5.1 Land Use and Planning

Act 250 is Vermont's land use and development law, enacted in 1970 at a time when Vermont was undergoing significant development pressure. The law provides a public, quasi-judicial process for reviewing and managing the environmental, social and fiscal consequences of major subdivisions and developments in Vermont. It assures that larger developments compliment Vermont's unique landscape, economy and community needs. One of the strengths of Act 250 is the access it provides to neighbors and other interested parties to participate in the development review process. Applicants often work with neighbors, municipalities, state agencies and other interested groups to address concerns raised by a proposed development, resolving issues and mitigating impacts before a permit application is filed (VT NRB 2021).

5.5.1.1 Existing Conditions

The primary land use in the project area is residential with a commercial district along Birge Street southeast of the project area. The property is in the "Waterfront" zoning district: The purpose of this district is to encourage the management or development of these lands in accordance with the policies of the Brattleboro Town Plan and in a

manner that takes advantage of their proximity to water through means such as: (1) Fostering new or expanded water-dependent and recreation-oriented uses; (2) Protecting and enhancing water quality and the ecological function of riparian areas; (3) Contributing to a system of pathways and greenways along major streams and rivers; and (4) Providing visual and/or physical access to surface water resources as a site amenity (Brattleboro, 2015).

5.5.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, leaving the site in its current condition would not meet the goals of the waterfront district and the socioeconomic effect of continued flooding on land use in the area would be **none**.

Alternative 2: Proposed Action

The Proposed Action Alternative would support the Town Plan by increasing flood protection for downstream properties, improving recreational access to the Whetstone Brook (e.g., ADA compliance) and would formalize an area for residents to exercise and spend time outside. It would create greater flood storage in the area but would not change the current land use for both natural systems and the surrounding development. The Proposed Action would support the Town Plan: "Provide the highest degree of flood protection at the least cost, through the identification and accommodation of natural flooding and channel migration processes posing hazards to life or property actions: 12.2.3 Support land conservation efforts that restore floodplain access along the Whetstone Brook; 12.2.4 Preserve areas for natural storage in the floodplain (Brattleboro, 2018). The socioeconomic effects would be **moderate**.

5.5.2 Noise

EPA developed federal noise-emission standards in accordance with the Noise Control Act of 1972 identifying major sources of noise and determining appropriate noise levels for activities that would infringe on public health and welfare in accordance with the law. The EPA identifies a 24-hour exposure level of 70 decibels as the level of environmental noise which would prevent any measurable hearing loss over a lifetime. Likewise, levels of 55 decibels outdoors and 45 decibels indoors are identified as preventing activity interference and annoyance. The levels are not single event, or "peak" levels. Instead, they represent averages of acoustic energy over periods of time such as 8 hours or 24 hours, and over long periods of time such as years (EPA 1974). Additionally, the Federal Highway Administration established acceptable noise levels and ranges for construction equipment (FHWA 2006) and the Occupational Safety and Health Administration established thresholds for occupational noise exposure to protect the health and safety of workers (29 C.F.R. 1926.52). Land uses that are considered sensitive to noise effects are referred to as "sensitive receptors." Noise sensitive receptors consist of, but are not limited to, schools, residences, libraries, hospitals, and other care facilities.

5.5.2.1 Existing Conditions

Current sources of noise in Brattleboro and the neighborhood adjacent to the project site includes local car and truck traffic, lawn mowing and leaf blowing. The river creates a constant, mostly pleasant natural sound though boulders rolling down stream can be loud and disturbing during flood events. Construction noise is regulated by the Town of Brattleboro Code.

5.5.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would not involve any construction and would not affect noise levels, traffic flow, or public services. Occasional flooding could temporarily increase noise levels from generators and emergency equipment in the area. Effects would be **none to negligible**.

Alternative 2: Proposed Action

Construction equipment for the Proposed Action Alternative would temporarily increase noise levels at the project site and in the Birge Street neighborhood along the construction vehicle access route. Construction hours would be limited by local ordinance to between the hours of 7 a.m. and 9 p.m. Monday through Saturday (Brattleboro 2018b). Noise impacts from the Proposed Action are estimated to last 8-12 weeks and the localized effect would be **moderate** (Schiff 2021).

5.5.3 Transportation

5.5.3.1 Existing Conditions

The project is located at the end of Birge Street, a town road. Birge Street and the project area are east of Interstate 91, south of Vermont Route 9 and west of Vermont Route 5. Williams Street is immediately north of the river at the project site.

5.5.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, continued flooding downstream could cause temporary road closures and re-routing of traffic due to standing floodwaters and erosion damages or repairs. Effects would be **minor**.

Alternative 2: Proposed Action

Construction for the Proposed Action Alternative would temporarily cause an appreciable increase in truck traffic in the neighborhood along Birge Street. Birge Street provides the only access to the project site and all construction vehicles would need to pass through this neighborhood. Some minor damages to Birge Street (road, sidewalks, and curbs) are expected and would be repaired as part of the project proposal. All roadways, sidewalks and walkways in the area would be maintained free of soil, mud, and construction debris. If traffic control is necessary, it would need to conform to guidelines set in the FHWA's most current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MMI 2020, FHWA 2012).

Overall, the creation of a new public recreation area would increase traffic from what it has been recently but would be less than when the site was used for commercial purposes. The Proposed Action Alternative is designed to reduce flooding and reduce the amount of road closures during and after storm events. The short-term localized effect to the neighborhood would be **moderate**. The long-term effect on transportation would be **minor.**

5.5.4 Public Services and Utilities

5.5.4.1 Existing Conditions

The project area is served by above ground electric service and Town water and sewer service. Water and sewer lines traverse the north end of the project area.

5.5.4.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative could lead to flooding on Williams Street that could temporarily interrupt utilities in the area and downstream. The effect would be **minor.**

Alternative 2: Proposed Action

The Proposed Action Alternative is not intended to interrupt utility services during or after construction and would mitigate against future utility damages from flooding. The Brattleboro Zoning Permit requires that the applicant must coordinate with the Brattleboro Department of Public Works to ensure the protection of sewer and waterlines

(Brattleboro 2018c). Sewer and waterlines would be protected by riprap on the upstream side of the pipes (Brattleboro DRB 2018). The effect would be **minor.**

5.5.5 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 population exceeds 50 percent is considered to have an environmental justice population, based on the CEQ guidance.

5.5.5.1 Existing Conditions

The project is in the Brattleboro Census Designated Place. There are 6,507 people who are 94% white and 3.6% two or more races. The median income is $34,749 and the poverty rate is 25%. (US Census 2010). According to EJ Mapper, the parcel is in an area with 38% low income and 6% minority residents. North of the river, there is 58% low income and 14% minority (EPA).

5.5.5.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would keep the neighborhood the same. The effect would be **none.**

Alternative 2: Proposed Action

While minority and low-income populations may be represented in the area surrounding the project, they will not be subject to disproportionately high adverse impact on human health or environmental effects from the project. Construction effects to environmental justice populations would be **negligible**.

Post construction, the project site would be open to the public and available for use by all residents, including environmental justice populations. Long-term, the Preferred Action would have beneficial effects to the neighborhood through reduction of flood risks and creation of an urban park. Long-term beneficial effects would be **minor.**

5.5.6 Hazardous Materials and Public Health

The Vermont Department of Environmental Conservation (VT DEC) and the Investigation and Remediation of Contaminated Properties Rule (I-Rule) established soil standards for the State of Vermont (VT ANR 2019). The I-Rule standards are defined against three threshold levels: Residential standard, Non-Residential standard, and the Urban Background value. The Residential standard is the most stringent of the three values and is applied at all locations that are used as a residence as well as parks, playgrounds, schoolyards, and childcare facilities. The Residential standard includes an exception for properties that lie within a designated urban area; these properties must first be compared against the Urban Background value. The Non-Residential standard is applied for any property or portion thereof that is designated for non-residential use by municipal zoning ordinance or has a restriction prohibiting residential use.

5.5.6.1 Existing Conditions

Approximately 3 acres of the 12-acre parcel along the northern third of this property have soils impacted by polycyclic aromatic hydrocarbons (PAHs) at levels above State of Vermont residential soil standards ("Residential VSS"). At

present, the site is used only occasionally and informally by residents for walking, and the PAH levels pose little risk to human health. The property is located within a designated urban area as classified by the VT DEC requiring that PAH concentrations would be compared against the Urban Background value. The PAH levels found in the shallow soils at the project area are above the Residential VSS but below both the Non-Residential VSS and Urban Background value (concentration of 0.580 mg/kg.). Although the soils are not subject to corrective action and management, to proceed with the planned reclamation efforts at the Site, these PAH-impacted soils would either have to remain at the Site or be brought to another approved location within Brattleboro, VT.

5.5.6.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, no soils would be disturbed. The fill soil, particularly in the northern and central portions of the site, would continue to have PAH (polycyclic aromatic hydrocarbons) concentrations that exceeds the Residential VSS but below the Non-Residential VSS and the Urban Background value. At present, the site is used only occasionally and informally by residents for walking, and the PAH levels are within the normal background range observed within an urban environment in Vermont and pose little risk to human health. Effects would be **none.**

Alternative 2: Proposed Action

Under the Proposed Action, excavation and removal of fill in the northern section of the site would expose PAH contaminated soils. Because the soil located in the southern two thirds of the Site was not found to be impacted with PAHs, the Proposed Action would over excavate an approximate 4.0-acre area in the southern section of the site by 18 to 24 inches, and up to 10,000 cubic yards of PAH impacted soils would be relocated as backfill into the over excavated area. A topsoil cover layer would be installed over these relocated soils, which would provide a barrier layer over these soils and help to establish vegetation cover in the newly cut and restored floodplain. This would keep the soils on site and would eliminate the need to remove them and find a suitable facility to accept the impacted soils in keeping with EPA and Vermont standards (LE Environmental 2018, KAS 2021).

Site considerations for the 4.0 acre over excavation area would include a minimum 30-foot wide buffer between the Whetstone Brook ordinary high-water mark and the designated over excavation area to help ensure that relocated soils are placed outside of areas most prone to fluvial erosion. The buffer is extended beyond 30 feet where existing trees along the bank and riparian area are designated to remain and set back a minimum of 15 feet inland from the portions of the riverbank that include armoring. All over excavation and soil relocation work would also be subject to an erosion prevention and sediment control plan (KAS 2021).

Since the Site soils are impacted with PAH below urban standards, this means the site soil PAH concentrations are within the normal background range observed within an urban environment in Vermont have been determined to be safe for the intended park use (LE Environmental 2018, KAS 2021). Under the Proposed Action, the corrective action would further reduce current exposure levels and pose no increased environmental risk to site users than other parks and trails in Brattleboro. The effects would be **minor.**

6.0 PERMITS AND PROJECT CONDITIONS

The Vermont River Conservancy is responsible for obtaining all required federal, state, and local permits. While a good faith effort was made to identify all necessary permits for the preparation of 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, Vermont River Conservancy must provide FEMA with a copy of the required permit(s) from all pertinent regulatory agencies.

1. US Army Corps of Engineers (Section 404)
2. Vermont Stream Alteration Permit
3. Vermont Department of Environmental Conservation (DEC) 401 Water Quality Certification
4. Vermont State Wetland Permit
5. 402 Stormwater Construction Permit
6. Local Zoning permit 2018-98, dated August 30, 2018
7. Local Floodplain Permit
8. FEMA No-Rise Certification
9. Vermont Act 250
10. Letter of [Flood] Map Revision

Additionally, FEMA would require the Vermont River Conservancy to adhere to the following conditions during project implementation. Failure to comply with grant conditions may jeopardize federal funds.

1. In-water-work Time of Year Restriction
2. Inadvertent discovery of archeological resources and human remains conditions
3. Avoidance Plan for Archeology (unless Section 106 consultation process concludes with data recovery)
4. 50-foot buffer around all Class II wetland areas

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The following is a good faith effort to capture all coordination and consultation with state and federal partners:

- A site visit was held prior to drafting the Environmental Assessment on October 28, 2020. Representatives included Vermont River Conservancy, FEMA, Town of Brattleboro Zoning, Vermont Emergency Management, Landslide, Inc., and Milone & MacBroom, Inc.
- Environmental Assessment "Scoping Checklist" distributed by FEMA to state and federal partner agencies on November 24, 2020. Comments were received from NRCS regarding required consultation under the FPPA; USACE regarding the requirement for a CWA Section 404 permit; USFWS regarding their availability for technical assistance and consultation under the ESA; and VT Department of Fish and Wildlife regarding required consultation for northern long-eared bat under the ESA.
- Early Public Notice notifying the public of FEMA's decision to prepare an Environmental Assessment and work affecting the floodplain and wetlands was published in the Brattleboro Reformer (print) on March 18, 2021. No comments were received.
- Coordination with Al Averill, Natural Resource Conservation Service (NRCS) regarding Prime Soils under Farmland Policy Protection Act November 30, 2020 – December 1, 2020.
- Consultation with State Historic Preservation Office and interested Tribes started April 7, 2021 and ongoing.
    - Archaeological Resource Assessment (ARA) conducted on the project area in 2018
    - Phase 1 Survey and partial Phase II Survey conducted in 2019
    - FEMA becomes the lead Federal Agency for Section 106 consultation on April 7, 2021
    - FEMA submitted a Phase II Archaeological Survey Recommendation to the SHPO's office on April 29, 2021
    - SHPO concurrence received for Phase II on April 30, 2021
    - Phase II Survey Field Work conducted July of 2021
    - Phase II Survey results received by FEMA on August 24, 2021
    - Request for additional information regarding the survey sent and response received October of 2021
    - Section 106 Adverse Effect letter sent to SHPO, ACHP, and other stakeholders on November 16, 2021
    - ACHP concurrence received on November 30, 2021
- Vermont Department of Environmental Conservation Wetlands Division completed a site inspection/report the on 11/7/2019 and communicated acceptance to the Subapplicant on 11/20/2019.
- Coordination with Vermont Department of Fish and Wildlife for northern long-eared bat on occurred December 16, 2020, January 7, 2021, and January 13, 2021. Informal consultation initiated under Section 7 of the ESA with U.S. Fish and Wildlife Service occurred on March 12, 2021; concurrence assumed on April 12, 2021.
- Coordination with the DEC River Management Program is ongoing.
- Coordination with USACE regarding permitting beginning 2018 and ongoing.
- Coordination with Local and Regional Floodplain Administrator dating back to summer of 2018.
- EPA coordination November 17, 2020 and January 27, 2021 regarding the project proponent's participation in the Brownfield Program for this site, EPA's coordination with the State Historic Preservation Office prior to FEMA's involvement in the project. FEMA also requested EPA's assistance as Subject Matter Experts with the Hazardous Waste Sections and Public Safety Sections of the Environmental Assessment.

The following documents the opportunities for the public to comment on the decision-making process.

- Public Notice for availability of the Draft EA was posted on the Vermont River Conservancy's website at: https://vermontriverconservancy.org/public-notice.
- Public Notice for availability of the Draft EA was also sent via email to Timothy Timmerman, EPA Region 1; Mr. Rich Holshush, the local representative of the Abenaki Tribe and Mr. Jason Cooper, owner of several of the apartment buildings adjacent to the project site.
- The Draft EA was made available in hard copy at the Brattleboro Planning Department, Brattleboro Municipal Center, 230 Main Street, Suite 202, Brattleboro, VT 05301.
- Public Notice for availability of the Draft EA was also published in the Brattleboro Reformer which posted on December 21, 2021.
- The Draft EA was made available electronically for public comment and was able to be viewed and downloaded at: https://vermontriverconservancy.org/public-notice (direct link at https://vermontriverconservancy.org/wp-content/uploads/Sawdust-Alley-Draft-EA_508_2021.12.02-1.pdf) and Region 1 - Environmental Documents and Public Notices | FEMA.gov.
- The comment period ended on January 6, 2022, 15 days from the date of the legal notice publication. Written comments could be emailed to david.robbins@fema.dhs.gov or sent to FEMA Regional Environmental Officer, 99 High Street, Boston, MA 02110. If no substantive comments were received, the EA would become final and a Finding of No Significant Impact would be signed. Substantive comments would be addressed as appropriate in the final EA and in the FONSI.

Three comments were received:

- Jenna Etra commented on December 21, 2021. Her comment was one of general support and she inquired about how she could be involved in the project. Specifically, if there were opportunities for tending plants and encouraging native species & ecosystem health. FEMA thanked Ms. Etra for her comment on December 21, 2021 and provided her with the Vermont River Conservancy's contact information to inquire about opportunities to be in involved.
- Tom Mosakowski commented on December 29, 2021. His comment was one of general support with two suggestions: 1. Mr. Mosakowski suggested that the project make access from the other public streets to the southern end of the site parcel, and he provided a drawing for consideration. 2. He suggested that the project broaden/substitute the plant list towards other natives, nearly-natives, and non-invasive non-natives that would give visitors an enhanced experience by moving through an edible landscape, or an arboretum-like landscape. FEMA thanked Mr. Mosakowski for his comments on December 30, 2021 and provided him with the Vermont River Conservancy's contact information to further discuss his ideas.
- Jaimie Scanlon and Morris Kimura commented on January 4, 2022. They are adjacent property owners and expressed concern about increased public activity at the project property to include squatters, trespass, litter, etc. The comment also includes a request to repair the “heavy-duty metal fence along the interior edge of the field that separates the field from the wooded area”, and a request for “assurances from FEMA, the VRC, and the town of Brattleboro that this will be taken into account and measures taken to avoid escalation of this situation”. FEMA thanked J. Scanlon and M. Kimura for their comments on January 6, 2022 and provided them with both the Vermont River Conservancy's and Town of Brattleboro's point of contact information. Steve Libby from the Vermont River Conservancy intends to make contact to address their comments and further discuss their concerns.

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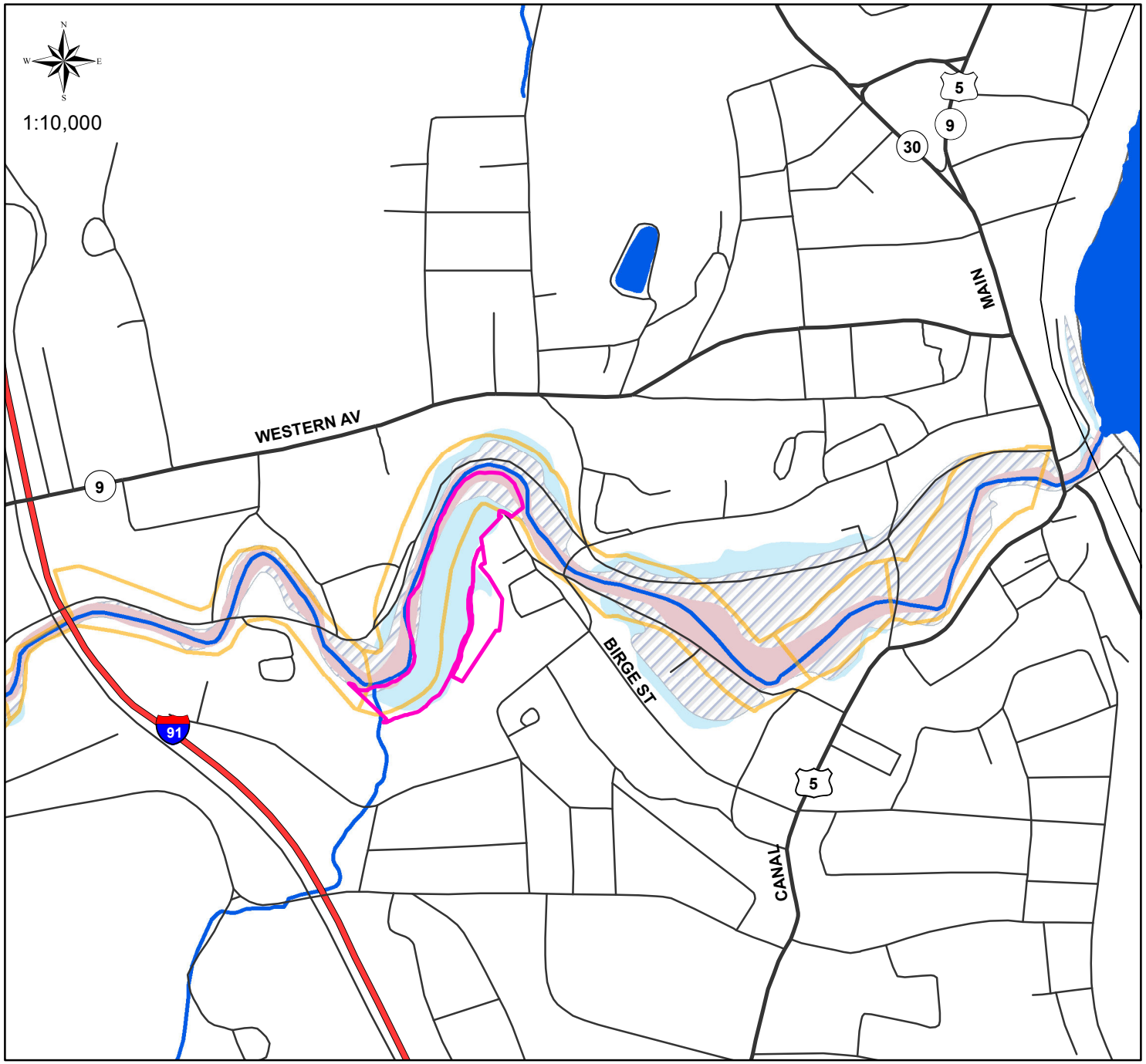
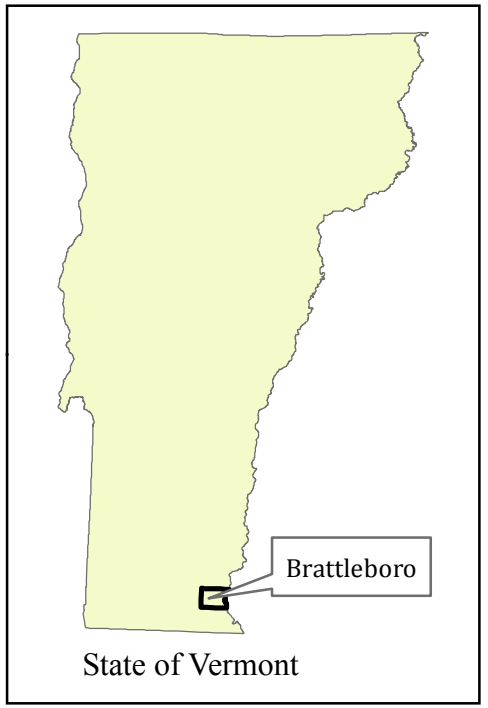
APPENDIX A:

Maps and Figures

Hazard Mitigation Program Project Locator Map
Whetstone Brook Floodplain Restoration





Legend

- Project Area
- Railroad
- Fluvial Erosion Hazard Zone
- Surface Water
- Floodway

Flood Insurance Rate Map (FIRM)

- 500 Year Floodplain
- 100 Year Floodplain

Landslide Natural Resource Planning
Linking people to their landscape
P O Box 311
East Middlebury, VT 05740

December 2020

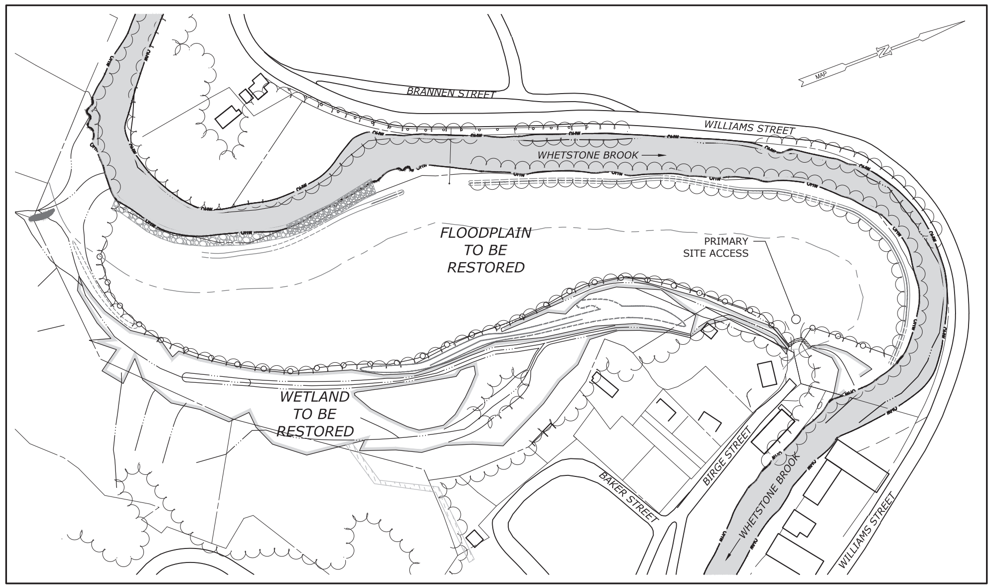
APPENDIX B:

Project Documents and Designs

WHETSTONE BROOK FLOODPLAIN RESTORATION

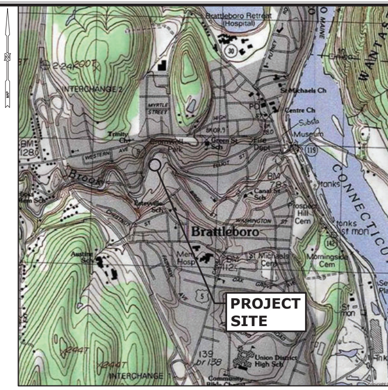
250 BIRGE STREET
BRATTLEBORO, VERMONT

SEMI-FINAL DESIGN
JANUARY 23, 2020



PROJECT SITE VICINITY MAP:

SCALE 1" = 150'



LOCATION MAP:

PREPARED FOR:

TOWN OF BRATTLEBORO, DEPARTMENT OF PLANNING
230 MAIN STREET, SUITE 202
BRATTLEBORO, VT 05301

VERMONT RIVER CONSERVANCY
29 MAIN STREET
MONTPELIER, VERMONT 05602

LIST OF DRAWINGS

NO.	NAME	TITLE
01	--	TITLE SHEET
02	SP1	SITE PLAN - EXISTING
03	SP2	SITE PLAN - PROPOSED
04	SP3	SITE PLAN - REMOVALS
05	SP4	SITE PLAN - GRADING
06	SP5	SITE PLAN - LANDSCAPE
07	SP5	SITE PLAN - CONSTRUCTION
08	XS1	TYPICAL CROSS SECTIONS
09	PRO1	PROFILE
10	DET1	DETAILS I
11	DET2	DETAILS II
12	V1	CERSOSIMO BOUNDARY / RETRACEMENT SURVEY (MSK ENGINEERING, INC.)

PREPARED BY:

MILONE & MACBROOM
1 SOUTH MAIN STREET, 2ND FLOOR
WATERBURY, VT 05676
802.882.8335
WWW.MMINC.COM

811
Know what's below.
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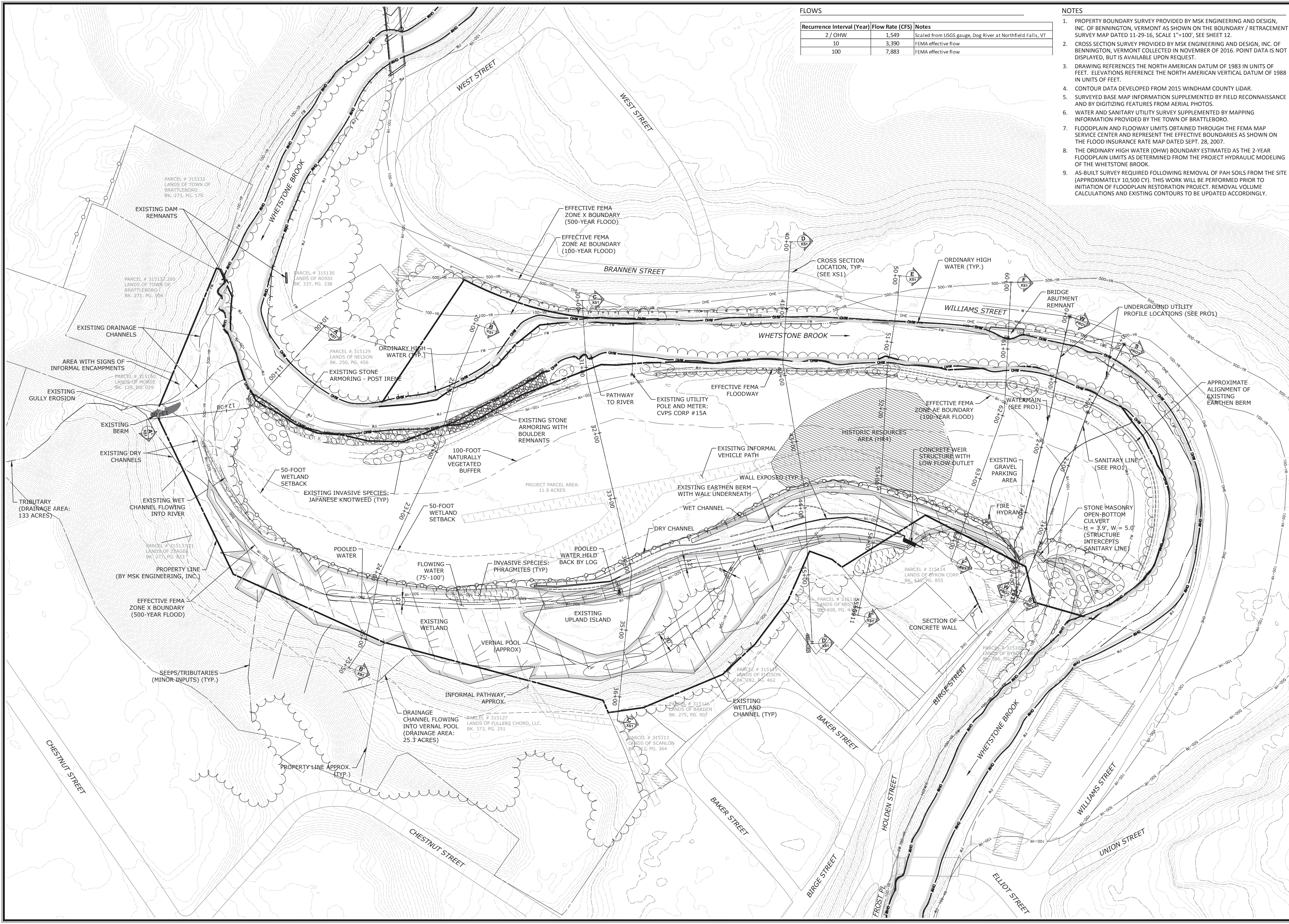


FLOWS

Recurrence Interval (Year)	Flow Rate (CFS)	Notes
2 / OHW	1,549	Scaled from USGS gauge, Dog River at Northfield Falls, VT
10	3,390	FEMA effective flow
100	7,883	FEMA effective flow

NOTES

1. PROPERTY BOUNDARY SURVEY PROVIDED BY MSK ENGINEERING AND DESIGN, INC. OF BENNINGTON, VERMONT AS SHOWN ON THE BOUNDARY / RETRACEMENT SURVEY MAP DATED 11-29-16, SCALE 1"=100', SEE SHEET 12.
2. CROSS SECTION SURVEY PROVIDED BY MSK ENGINEERING AND DESIGN, INC. OF BENNINGTON, VERMONT COLLECTED IN NOVEMBER OF 2016. POINT DATA IS NOT DISPLAYED, BUT IS AVAILABLE UPON REQUEST.
3. DRAWING REFERENCES THE NORTH AMERICAN DATUM OF 1983 IN UNITS OF FEET. ELEVATIONS REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 IN UNITS OF FEET.
4. CONTOUR DATA DEVELOPED FROM 2015 WINDHAM COUNTY LiDAR.
5. SURVEYED BASE MAP INFORMATION SUPPLEMENTED BY FIELD RECONNAISSANCE AND BY DIGITIZING FEATURES FROM AERIAL PHOTOS.
6. WATER AND SANITARY UTILITY SURVEY SUPPLEMENTED BY MAPPING INFORMATION PROVIDED BY THE TOWN OF BRATTLEBORO.
7. FLOODPLAIN AND FLOOWAY LIMITS OBTAINED THROUGH THE FEMA MAP SERVICE CENTER AND REPRESENT THE EFFECTIVE BOUNDARIES AS SHOWN ON THE FLOOD INSURANCE RATE MAP DATED SEPT. 28, 2007.
8. THE ORDINARY HIGH WATER (OHW) BOUNDARY ESTIMATED AS THE 2-YEAR FLOODPLAIN LIMITS AS DETERMINED FROM THE PROJECT HYDRAULIC MODELING OF THE WHETSTONE BROOK.
9. AS-BUILT SURVEY REQUIRED FOLLOWING REMOVAL OF PAH SOILS FROM THE SITE (APPROXIMATELY 10,500 CY). THIS WORK WILL BE PERFORMED PRIOR TO INITIATION OF FLOODPLAIN RESTORATION PROJECT. REMOVAL VOLUME CALCULATIONS AND EXISTING CONTOURS TO BE UPDATED ACCORDINGLY.

MILONE & MACBROOM
1 SOUTH MAIN STREET, 2ND FLOOR
WATERBURY, VT 05676
802.882.8335
WWW.MMINC.COM

DESCRIPTION	DATE	BY

SITE PLAN - EXISTING

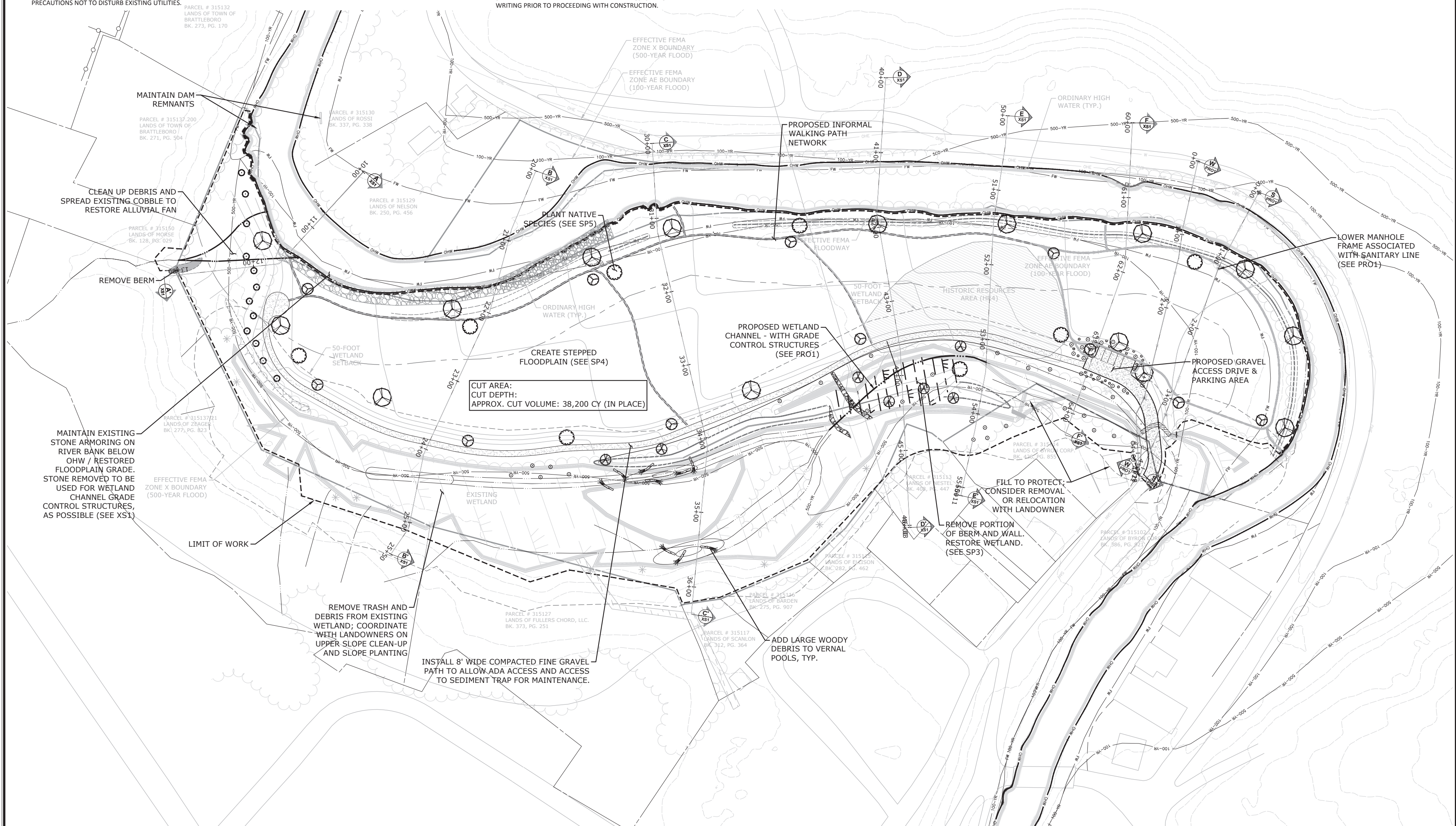
WHETSTONE BROOK FLOODPLAIN RESTORATION
250 BIRGE STREET
BRATTLEBORO, VERMONT

DESIGNED	DRAWN	CHECKED
BMC	BMC	RKS

SCALE: 1" = 60'
DATE: JANUARY 23, 2020
PROJECT NO.: 3864-07
SHEET NO.: 2 OF 12
SHEET NAME: SP1

GENERAL NOTES

1. THE CONTRACTOR SHALL DESIGNATE A SUPERINTENDENT AT THE START OF CONSTRUCTION AND THE CONTRACTOR'S SUPERINTENDENT SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR AND THEIR JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR COMPLYING WITH THE JOB SPECIFICATIONS AND PERMIT REQUIREMENTS.
2. THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF PLANS ON SITE AT ALL TIMES AND FOLLOW THE SPECIFICATIONS, DETAILS, AND NOTES FOR ALL ASPECTS OF THE PROJECT. ANY CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER IMMEDIATELY.
3. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER FOR DETERMINATION. THE CONTRACTOR IS EXPECTED TO PROVIDE FIELD ENGINEERING SERVICES DURING CONSTRUCTION TO ESTABLISH AND RECORD GRADES, LINES, AND ELEVATIONS. EXACT ELEVATIONS, SLOPES, AND CHANNEL SHAPES WILL BE APPROVED IN FIELD BY THE PROJECT ENGINEER.
4. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "DIG SAFE" AT 1-888-DIG-SAFE (344-7233). THE CONTRACTOR SHALL TAKE PRECAUTIONS NOT TO DISTURB EXISTING UTILITIES.
5. CONTRACTOR MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL PERMITS AND REGULATIONS THROUGHOUT DURATION OF PROJECT. COMPLIANCE WITH ALL CONDITIONS OF APPLICABLE AND SECURED PERMITS IS THE RESPONSIBILITY OF BOTH THE CONTRACTOR AND THE PERMITTEE. COPIES OF ALL PERMITS AND AUTHORIZATIONS SHALL BE MAINTAINED ON THE PROJECT SITE BY THE CONTRACTOR THROUGHOUT CONSTRUCTION.
6. ALL STORAGE AND ACCESS ROUTES, PEDESTRIAN FENCES/BARRIERS, WORKING HOURS, AND LIMITS OF CLEARING SHALL BE FLAGGED BY CONTRACTOR PRIOR TO CONSTRUCTION AND APPROVED BY TOWN, AND PROJECT ENGINEER.
7. ALL EQUIPMENT USED IN OR NEAR TO THE WATER SHALL HAVE TIGHT SEALS, AND SHALL NOT POLLUTE THE WATER. NO CONSTRUCTION VEHICLES SHALL BE STORED, SERVICED, WASHED OR FLUSHED IN A LOCATION WHERE LEAKS, SPILLAGE, WASTE MATERIALS, CLEANERS, OR WATERS WILL BE INTRODUCED OR FLOW INTO WETLANDS OR WATERCOURSES. AN EMERGENCY MANAGEMENT PLAN AND SPILL KIT WILL BE MAINTAINED ON SITE AT ALL TIMES. IN THE EVENT OF AN ACCIDENTAL RELEASE, IMMEDIATELY STOP CONSTRUCTION WORK, CONTAIN THE SPILL, AND NOTIFY THE TOWN, APPROPRIATE AUTHORITIES AND PROJECT ENGINEER.
8. THE PROJECT SITE IS SUBJECT TO FLOODING. THE CONTRACTOR SHALL MONITOR WEATHER FORECASTS AND STABILIZE THE CONSTRUCTION SITE AND REMOVE EQUIPMENT FROM FLOOD PRONE AREAS IN THE EVENT OF FLOOD WARNINGS. ALL WORK SHALL BE PERFORMED DURING NON-FLOOD CONDITIONS. A FLOOD CONTINGENCY AND EMERGENCY ACTION PLAN SHALL BE PROVIDED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
9. THERE SHALL BE NO CLAIMS FOR EXTRA COMPENSATION DUE TO DELAYS IN WATER CONTROL ASSOCIATED WITH HIGH WATER LEVELS FROM NATURAL EVENTS SUCH AS FLOODS.
10. THE CONTRACTOR SHALL MAINTAIN ALL ROADWAYS, SIDEWALKS, AND WALKWAYS IN THE AREA FREE OF SOIL, MUD, AND CONSTRUCTION DEBRIS. CONSTRUCTION ENTRANCES MUST BE MAINTAINED AT EACH SITE ACCESS POINT. SEE PLANS AND DETAILS.
11. TRAFFIC CONTROL, IF NECESSARY, MUST CONFORM TO GUIDELINES SET IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", MOST CURRENT EDITION, AS PUBLISHED BY DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.
12. ALL SKETCHES, SHOP DRAWINGS, OR CHANGE ORDERS REQUESTED SHALL BE REVIEWED AND APPROVED BY THE PROJECT ENGINEER IN WRITING PRIOR TO PROCEEDING WITH CONSTRUCTION.
13. EARTH MOVING AND HAULING, ROCK DRILLING OR CRUSHING, JACK HAMMER AND SIMILAR EXCESSIVELY LOUD EQUIPMENT SHALL NOT BE OPERATED ON SUNDAYS OR BETWEEN THE HOURS OF 5:30 P.M. AND 7:00 A.M. EXCEPT IN EMERGENCY SITUATIONS.
14. TEMPORARY STOCKPILE AND STAGING AREAS TO BE FLAGGED BY CONTRACTOR PRIOR TO CONSTRUCTION AND APPROVED BY TOWN AND PROJECT ENGINEER, AND SHALL BE LOCATED AWAY FROM SENSITIVE AREAS INCLUDING BUT NOT LIMITED TO WETLANDS AND WATERCOURSES.
15. AT THE END OF EACH WORK DAY, THE CONTRACTOR SHALL PROVIDE A FORM OF BARRIER OR CONSTRUCTION FENCING AT THE SITE ENTRANCE TO PREVENT MOTORIZED VEHICLE ACCESS.
16. NO DISTURBANCE BEYOND THE ESTABLISHED LIMITS IS ALLOWED UNLESS PRIOR PERMISSION IS OBTAINED FROM THE TOWN AND PROJECT ENGINEER.
17. ALL PRECAUTIONS SHALL BE TAKEN TO PREVENT THE POTENTIAL TRANSPORT OF INVASIVE SPECIES TO OR FROM THE CONSTRUCTION SITE OR SPREADING WITHIN THE SITE. THE CONTRACTOR SHALL INSPECT AND CLEAN ALL EQUIPMENT PRIOR TO TRANSPORT TO THE CONSTRUCTION SITE. SEE INVASIVE SPECIES HANDLING NOTES ON SP3.
18. CONSTRUCTION IS TO TAKE PLACE DURING NON-FLOOD CONDITIONS. SIGNIFICANT WATER CONTROL IS NOT ANTICIPATED. THE CONTRACTOR SHALL BE PREPARED TO PROVIDE MINIMAL WATER HANDLING AS SPECIFIED ON THE CONSTRUCTION PLAN SHOULD THE NEED ARISE DURING CONSTRUCTION. CHANGES OR MODIFICATIONS TO THE WATER HANDLING APPROACH BY THE CONTRACTOR IS SUBJECT TO REVIEW AND APPROVAL BY THE PROJECT ENGINEER.
20. ALL AREAS SURROUNDING THE PROJECT SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED UPON COMPLETION OF CONSTRUCTION. THE RESTORATION OF THE SITE IS SUBJECT TO APPROVAL BY THE TOWN AND THE PROJECT ENGINEER.
21. THE PROJECT SITE IS LOCATED IN A RESIDENTIAL NEIGHBORHOOD. ADEQUATE WARNING OF CONSTRUCTION ACTIVITIES AND SAFETY SIGNS ARE REQUIRED. CONTRACTOR SHALL PROTECT THE PUBLIC AT ALL TIMES. AN ADEQUATE TRAVEL LANE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION, AND IF CONDITIONS WARRANT, A FLAG PERSON SHALL BE POSTED TO ALLOW SAFE PASSAGE THROUGH THE CONSTRUCTION ZONE. PERMISSION AND APPROVAL BY THE TOWN SHALL BE REQUIRED FOR ANY TEMPORARY CLOSURE OF A ROADWAY, LANE, OR SIDEWALK DURING CONSTRUCTION.
22. FOLLOWING COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PARTICIPATE IN A FINAL SITE INSPECTION WITH THE TOWN AND PROJECT ENGINEER FOR THE PURPOSE OF VERIFYING THAT THE PROJECT HAS BEEN COMPLETED ACCORDING TO THE CONSTRUCTION PLANS, SPECIFICATIONS AND THE TERMS AND CONDITIONS OF THE CONTRACT.
23. BE AWARE OF THE POTENTIAL FOR TEMPORARY DWELLINGS APPEARING ON SITE PRIOR TO OR THROUGHOUT THE CONSTRUCTION PROCESS.



MILONE & MACBROOM
1 SOUTH MAIN STREET, 2ND FLOOR
WATERBURY, VT 05676
802.882.8335
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DESCRIPTION	DATE	BY

SITE PLAN - PROPOSED

WHETSTONE BROOK FLOODPLAIN RESTORATION

250 BIRGE STREET
BRATTLEBORO, VERMONT

BMC	LAW	RKS
DESIGNED	DRAWN	CHECKED

SCALE: 1" = 60'

DATE: JANUARY 23, 2020

PROJECT NO.: 3864-07

SHEET NO.: 3 OF 12

SHEET NAME: SP2

SITE RESTORATION NOTES

1. PRESERVE EXISTING NON-INVASIVE VEGETATION AND TREES ON THE RIVER BANK TO THE EXTENT POSSIBLE.
2. ALL CLEAN STOCKPILED TOPSOIL WITH NO INVASIVE SPECIES SHOULD BE REINSTALLED ON FLOODPLAINS, UPPER BANKS, OR DISTURBED AREAS FOLLOWING CONSTRUCTION.
3. FLOODPLAIN AND DISTURBED AREAS SHALL RECEIVE A MINIMUM OF 4" STOCKPILED TOPSOIL
4. APPLY 2 INCHES STRAW MULCH OVER ALL SEEDED AREAS.
5. ANY DISTURBED SLOPES 2:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL BLANKET PER DIRECTION OF PROJECT ENGINEER, SEE DET1.
6. RESTORE ALL ACCESS ROUTES USED DURING CONSTRUCTION TO PRE-EXISTING CONDITIONS, FILL RUTS CREATED BY EQUIPMENT TO RESTORE GRADE AND RE-VEGETATE AS NEEDED.
7. CONTRACTOR IS RESPONSIBLE FOR REPAIRS TO THE ROADS, SIDEWALKS, AND CURBS IF DAMAGED BY CONSTRUCTION ACTIVITIES.
8. RESTORE ALL OTHER DISTURBED AREAS WITHIN THE PROJECT SITE SUCH AS TEMPORARY ACCESS ROADS, STOCKPILE AREAS, STAGING AREAS, AND SURPLUS DISPOSAL AREAS TO ORIGINAL OR IMPROVED CONDITION.

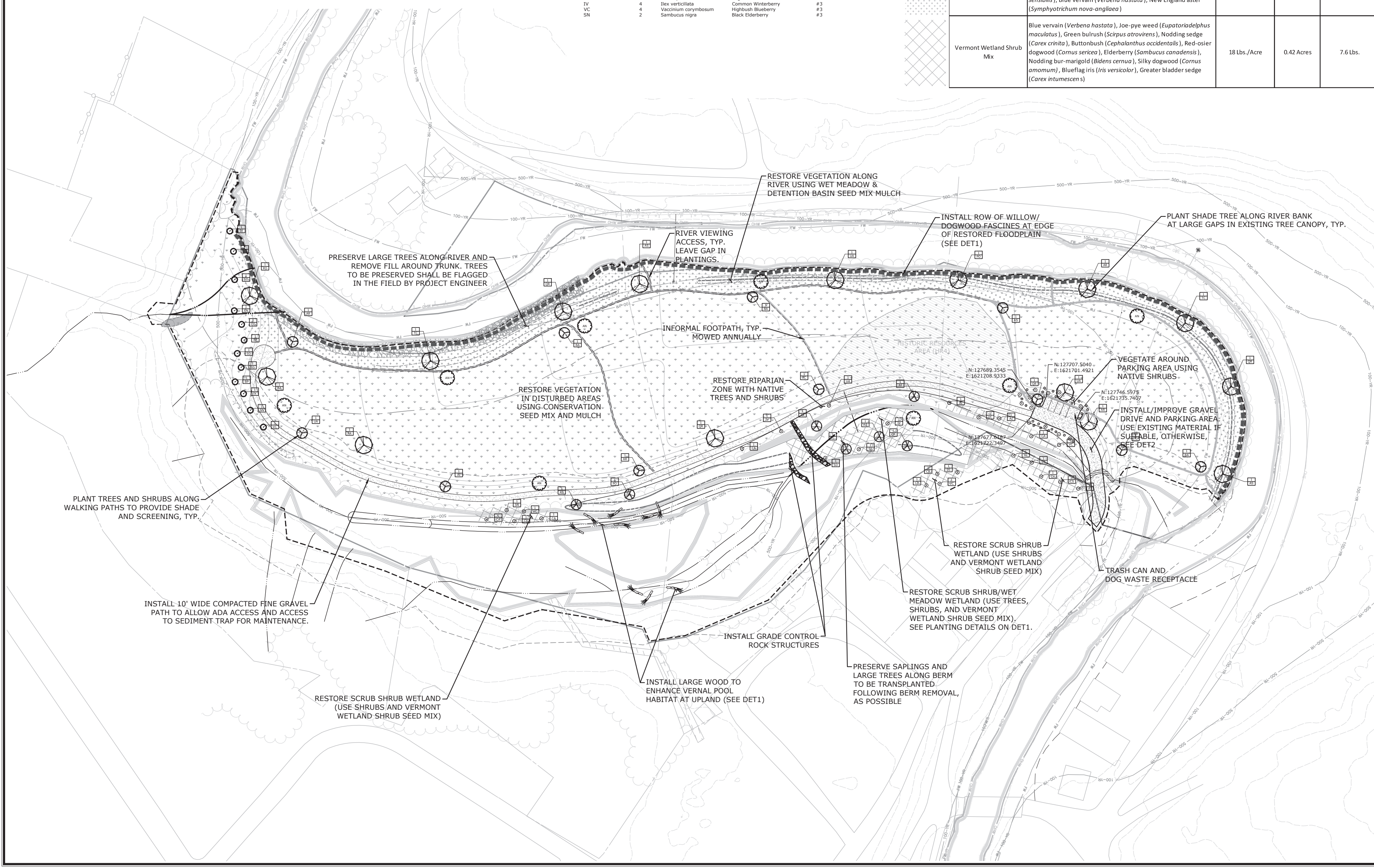
TREE LIST:

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
AN	8	Acer saccharinum	Silver Maple	2.5"-3" CAL.
AS	5	Acer saccharum	Sugar Maple	2.5"-3" CAL.
AR	6	Acer rubrum	Red Maple	2.5"-3" CAL.
QR	5	Quercus rubra	Red Oak	2.5"-3" CAL.
TC	4	Tsuga canadensis	Eastern Hemlock	2.5"-3" CAL.
PO	4	Platanus occidentalis	American Sycamore	2.5"-3" CAL.
UA	4	Ulmus americana	American Elm	2.5"-3" CAL.
BA	4	Betula alleghaniensis	Yellow Birch	2.5"-3" CAL.
AI	6	Alnus incana	Speckled Alder	2.5"-3" CAL.

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	CONT
CS	3	Cornus sericea	Red Osier Dogwood	#3
CA	6	Cornus amomum	Silky Dogwood	#3
SS	4	Salix spp.	Shrub Willow	#3
CO	1	Cephalanthus occidentalis	Buttonbush	#3
SD	4	Spiraea douglasii	Spirea	#3
BP	3	Betula pumila	Bog Birch	#3
IV	4	Ilex verticillata	Common Winterberry	#3
VC	4	Vaccinium corymbosum	Highbush Blueberry	#3
SN	2	Sambucus nigra	Black Elderberry	#3

SEED LIST:

	Species	Application Rate	Area	Estimated Quantity
Vermont Conservation Grass Seed Mix	35% Red Fescue, 25% Tall Fescue, 15% Annual Ryegrass, 12% Perrenial Ryegrass, 10% Kentucky Bluegrass, 3% White Clover	5 Lbs. / 1000 Sq Ft	255,000 Sq Ft	1275.0 Lbs.
Wet Meadow & Detention Basin Seed Mix	Switchgrass (*Panicum virgatum*), Virginia wild rye (*Elymus virginicus*), Red fescue (*Festuca rubra*), Fox sedge (*Carex vulpinoidea*), Woolgrass (*Scirpus cyperinus*), Green bulrush (*Scirpus atroviren* s), Nodding bur-marigold (*Bidens cernua*), Boneset (*Eupatorium perfoliatum*), Joe-pye weed (*Eupatoriadelphus maculatus*), soft rush (*Juncus effusus*), Sensitive fern (*Onoclea sensibilis*), Blue vervain (*Verbena hastata*), New England aster (*Symphyotrichum nova-angliaea*)	35 Lbs./Acre	1.50 Acres	5.2 Lbs.
Vermont Wetland Shrub Mix	Blue vervain (*Verbena hastata*), Joe-pye weed (*Eupatoriadelphus maculatus*), Green bulrush (*Scirpus atrovirens*), Nodding sedge (*Carex crinita*), Buttonbush (*Cephalanthus occidentalis*), Red-osier dogwood (*Cornus sericea*), Elderberry (*Sambucus canadensis*), Nodding bur-marigold (*Bidens cernua*), Silky dogwood (*Cornus amomum)*, Blueflag iris (*Iris versicolor*), Greater bladder sedge (*Carex intumescen* s)	18 Lbs./Acre	0.42 Acres	7.6 Lbs.



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DESCRIPTION	DATE	BY

SITE PLAN - LANDSCAPE

WHETSTONE BROOK FLOODPLAIN RESTORATION

250 BIRGE STREET
BRATTLEBORO, VERMONT

BMC	LAW	RKS
DESIGNED	DRAWN	CHECKED

SCALE: 1" = 60'

DATE: JANUARY 23, 2020

PROJECT NO. 3864-07

SHEET NO. 6 OF 12

SHEET NAME: SP5

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: Whetstone Brook Floodplain Restoration
LOCATION: Brattleboro, Vermont along the Whetstone Brook
(approximate center point: 42.849274, -72.570473)

BACKGROUND:

The Whetstone Brook Floodplain Restoration project is located at 250 Birge Street, Brattleboro, VT. This location lies within the Connecticut River Valley in the southeast corner of Vermont in Windham County and is approximately 1 mile upstream from the confluence with the Connecticut River (Appendix A, Document 1). The Whetstone Brook Watershed spans the towns of Brattleboro and Marlboro with a small portion of the northern watershed being in Dummerston. The watershed is 27.4 square miles (17,566 acres) and the Whetstone Brook is 13 miles long.

The project site was formerly owned by Cersosimo Lumber Company and was filled for historic uses such as log storage and milling. Sand and gravel fill occupy the floodplain currently and the filled area does not flood during 100-year flood events on Whetstone Brook increasing flood risks both locally and downstream. The fill on site is contaminated with polyaromatic hydrocarbons (PAHs) from the historic industrial uses, but PAH levels were found to be at acceptable levels for urban soils and could remain on site (VT DEC 2019).

Records indicate a history of flooding in Brattleboro. The National Weather Service mentions Brattleboro in all of Vermont's storms of record, including the 1869 "Freshet," and the 1927, 1938, 1973 and 2011 (Tropical Storm Irene) floods (National Weather Service 2014). Flood elevation measurements taken following Tropical Storm Irene indicate that it was between a 50 and 100-year flood event (Schiff 2012). There is evidence throughout the watershed of historic channel straightening, dredging and berming – practices that, in large part, were repeated following Tropical Storm Irene.

Fifty buildings downstream of the project site were damaged by Tropical Storm Irene: nineteen had major damage and 31 had minor damage (Windham Regional Commission 2011). There are 45 acres of mapped floodplain on the Whetstone Brook downstream of Interstate 91: only 12 are undeveloped

DESCRIPTION OF PROJECT:

The purpose of the project is to restore the natural floodplain function, create additional flood storage and improve water quality within the Whetstone Brook watershed upstream of the Town of Brattleboro to reduce localized erosion and inundation flood damage to properties and public infrastructure adjacent to and downstream of the property. The proposed mitigation project is needed to lessen flood risk to human health, improved property and public infrastructure.

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

Per the FEMA Flood Insurance Rate Map (FIRM Panel: 50025C_222 Map Effective Date: Sep 27, 2007), the proposed project is located within the Regulatory Floodway and the Special Flood Hazard Area (100-year floodplain – Zone AE) and Zone Shaded X (Appendix A, Document 1).

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

Yes, the proposed work is to remove historic fill from the floodplain, restore natural floodplain function and storage capacity and restore wetlands on site.

Determine whether the proposed action is within a designated wetland.

Yes, historic alterations of the flow across the site have created a wetland along the east side. A wetland delineation was completed, field checked and accepted on 11/7/2019; the wetland is classified as a Class II wetland under the Vermont Wetland Rules. Additionally, the U.S. Fish and Wildlife Service National Wetland Inventory identifies Whetstone Brook as a riverine wetland (Cowardin classification code R3UBH - riverine, upper perennial, unconsolidated bottom and permanently flooded), but this classification does not require the wetland 8-step process under Executive Order (EO) 11990, as it is not classified as wetlands per Section 7(c) of the EO.

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.

Early Public Notice notifying the pubic of FEMA's decision to prepare an Environmental Assessment and work affecting the floodplain and wetlands was published in the Brattleboro Reformer (print) on March 18, 2021. No comments were received.

Additionally, FEMA's NEPA Scoping Document was distributed to state and federal partner agencies on November 24, 2020. No comments were received regarding work in the floodplain or wetlands, but comments were received from the Natural Resource Conservation Service, U.S. Army Corps of Engineers and the Vermont Department of Fish and Wildlife.

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).

There are no practicable alternatives to locating the proposed action outside of the floodplain because the Proposed Action is designed to restore the floodplain and create additional flood storage capacity.

Again, there are no practicable alternatives to locating the Proposed Action outside wetland areas because the Proposed Action is designed to restore the health and function of the Class II wetlands and would reconnect the riverine wetland to the floodplain.

ALTERNATIVES CONSIDERED:

A hydraulic analysis of Whetstone Brook was conducted using HEC-RAS to evaluate existing conditions, examine alternatives, and guide selection of the preferred alternative. The model extended over nearly 1 mile, beginning at a point approximately 900 feet downstream of the Elliot Street Bridge extending to approximately 700 feet upstream of the Williams Street Bridge (second crossing near Crosby Street).

Alternative 1: No Action Alternative

If no action is taken, the status quo would remain at the project site and downstream where flood waters would not be reconnected with the local floodplain. The adjacent Williams Street and downstream properties would remain at the same level of flood risk.

Alternative 2: Proposed Alternative

The proposed action alternative includes the following components:

1. Remove approximately 2,000 linear feet of berm along the Whetstone Brook. Care would be taken to maintain mature trees growing at the base of the berm on the water side. Saplings would be saved to use in revegetation. Existing stone armoring located below ordinary high water would be left in place. The remaining stone would be used in grade control structures in the wetland restoration.

2. Create two floodplain terraces.
    - The lower floodplain, adjacent to the river channel, would be excavated to the two-year flood. The upper floodplain, adjacent to and east of the lower floodplain, would be excavated to the 10-year flood. Approximately 38,000 cubic yards of material would be removed from a total of six acres.
3. 100-foot-wide vegetated buffer (from river's edge) would be planted in the lower floodplain.
4. Construct two north/south public recreation trails.
    - One at the top of the slope between the lower and upper floodplains would be less formal and include side trails that run east/west to provide access to the river at three or four locations.
    - The other trail located between the upper floodplain and the restored wetland, would be a 6-foot wide gravel path built for Americans with Disabilities Act (ADA) compliant access to the site.
5. Restore alluvial fan at toe of a tributary (133-acre drainage area) at the south end of the parcel:
    - Clean up debris and spread existing cobble.
6. Restore a locally significant wetland complex that would be protected by the floodplain restoration work
    - Working with the adjacent landowners, trash and debris would be removed from the slope above the wetland and the slope would be planted
    - Enhance a vernal pool with large wood
    - Install grade control rock structures
    - Remove a portion of a berm and wall to create a more natural path for water to flow; and
    - Construct sediment trap near the confluence of the two wetland areas
7. Maintain historic resources:
    - Historic resource area (archaeologically sensitive area) would be left in place (not excavated)
    - Dam remnants at west end of property to remain; and
    - Remnant bridge abutment to remain.
8. Remove invasive species:
    - Japanese knotweed and phragmites located in the floodplain restoration area would be removed.
9. Keep polycyclic aromatic hydrocarbon (PAH) contaminated soils on site:
    - Over excavate the south end of parcel to accommodate storage of designated urban soils
    - Three acres of urban soil at the north end of the parcel would be relocated to south end of the parcel where it can remain on site per EPA requirements.
10. Creation of a parking area for five cars:
    - Retain the gravel access drive and a small gravel parking area near entrance using existing material
    - Vegetate around the parking area using native shrubs
    - Install a bike rack, and
    - Install a trash can and dog waste receptacle

11. Utilities
    - Disconnect service and remove utility pole and meter in the middle of the property on riverbank
    - Lower manhole frame at north end near the river
    - Protect water and sewer line crossing the site, and
    - Maintain fire hydrant located near new parking area.

Alternative 3: Considered and Dismissed:

This alternative would lower the floodplain 2 feet from the river to the fence line providing a 0.6 – 1.1-foot decrease in flood elevation. This alternative would provide a consistent cut and a smaller cut which would generate less material for disposal. This alternative would also limit the lateral extent of the cut to primarily open areas and avoid impacts to non-riverine wetlands.

Alternative 4: Considered and Dismissed:

This alternative would lower the floodplain 4 feet from the river to the fence line providing a 0.6 to 2.0-foot decrease in flood elevations. This alternative would still provide a consistent cut but a larger cut than the 2-foot option generating more material to dispose of. This alternative would also limit the lateral extent of the cut to primarily open areas and avoid impacts to non-riverine wetlands.

Alternative 5: Considered and Dismissed:

This alternative would lower the floodplain to the 25-year flood level to toe of slope and provide a 0.5 to 0.7-foot decrease in flood elevations. This alternative would involve a smaller cut generating less material to dispose of. This alternative could limit the future use of the back of the site but has less potential to impact non-riverine wetlands. This alternative would not provide any flood elevation reduction for floods less than the 25-year event.

Alternative 6: Considered and Dismissed:

This alternative would construct a floodwall at the Art Center and would protect existing buildings against flooding but would result in a potential reduction in flood storage area and may potentially increase flood elevations locally. Additional modeling refinement would be needed, but this alternative was dismissed because it wouldn't provide the same level of flood storage as the Proposed Action.

Alternative 7: Considered and Dismissed:

This alternative would construct a flood bench at the Art Center. This would increase flood storage capacity upstream of the narrow Elliot St Bridge and would reduce the number of vulnerable properties but would require property acquisition. This alternative might reduce flood elevations and increase protection of Williams St, but additional modeling refinement would be needed to confirm. This alternative was dismissed because it wouldn't provide the same level of flood storage as the Proposed Action and would cost more because of the need for property acquisition.

Alternative 8: Considered and Dismissed

This alternative would lower the floodplain to the 2-year flood level and construct a flood bench at Art Center. This would remove the pinch point affecting flood elevations downstream of the Cersosimo floodplain lowering flood elevations 2.4 feet. This would likely move the pinch point downstream to the Elliot St Bridge, but additional modeling would be needed to confirm the effects of this alternative.

Alternative 9: Considered and Dismissed:

This alternative would lower the floodplain to the 2-year flood level and leave space for a park at the back of the floodplain. This alternative would locally decrease flood elevations 0.7 to 2.0 feet. This alternative would require a moderate cut generating more material to dispose of than some of the other alternatives and would limit the lateral extent of the cut to primarily open areas. This alternative would have less potential to impact non-riverine wetlands and space would remain at the back of the floodplain for future park use.

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

Under the Proposed Action, there would be no occupancy or support for development within the floodplain or wetland. 38,200 cubic yards of historic fill would be removed from the floodplain creating additional flood storage and reduce flood elevations 1.0 to 2.0 feet. Short-term adverse impacts include construction equipment working in the floodplain and near Whetstone Brook and the Class II wetland. The Proposed Action would also remove 6 acres of immature trees and brush in the upland areas.

Long-term impacts of the restoration of the floodplain include reduced flood velocities, and the capture of sediment, large woody debris, and ice during floods; flood debris can lead to jams at downstream bridges and narrow spots between buildings rapidly elevating floodwaters. The Proposed Action would also limit removal of mature trees and the planting of a riparian floodplain forest. All these factors combined would equate to a lower flood risk downstream at Williams Street and at the nearby houses.

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 would be avoided and minimized through design measures and permitting conditions. FEMA would require authorization from the local floodplain manager for work occurring within the floodway and Special Flood Hazard area.

Potential adverse effects would be minimized as long as all permit and grant conditions are adhered to (44 C.F.R. 9.11(d)(5)) including, but not limited to, BMPs such as developing a flood contingency and emergency action plan and maintaining copies of each at the construction site (design plan reference). Additionally, the parking area would be located outside of the Special Flood Hazard Area and the project area would remain greenspace in perpetuity.

FEMA would not require the project proponent to submit a Conditional Letter of Map Revision for approval before construction commences because the purpose and design of the project is to reduce flood elevations and flood risk. Post construction, the Project proponent should apply for a Letter of Map Revision to FEMA to accurately capture the new flood elevations and flood risk to the community per 44 C.F.R. 65.6.

Minimization measures include:

- The proposed project is a functionally dependent use (9.11(d)(1)(i)),
- a local certificate demonstrating no rise anywhere within the community is required (9.11(d)(4)),
- the proposed project as designed meets the criteria as being the only practicable alternative and would restore the floodplain (9.11(d)(5)),
- and the proposed project will be conditioned for a local floodplain permit demonstrating consistency with the NFIP (9.11(d)(6)),
- Maintaining a 50-foot buffer around all Class II wetland areas
- planting a riparian floodplain forest

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 to restore the floodplain function and capacity, restore wetlands and reduce flood risk within the community. The proposed project design provides flood mitigation and ecological restoration along Whetstone Brook; flood hazards would be reduced and there would be a net improvement to wetlands. No other alternatives provide the same level of flood protection to the community.

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.

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.

The FEMA project grant will be conditioned for the Applicant to secure federal, state and local permitting for work in the floodplain and wetland: including a permit from the Regional Floodplain Administrator, a "no rise" certificate, a Town of Brattleboro Zoning Permit (which includes local floodplain and wetland review), a Vermont Wetland Permit and a Vermont Stream Alteration Permit. Compliance with all federal, state and local permits will determined as part of the grant close-out process.

Prepared by:

This 8-Step Decision Making Document was prepared by Eric Kuns, Senior Environmental Protection Specialist, FEMA Region I.