

Clarksburg, Massachusetts

Municipal Vulnerability Preparedness (MVP)

Summary of Findings

December 2022



BRPC

Berkshire Regional Planning Commission

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Overview

Introduction

The need for municipalities to increase resilience and adapt to extreme weather events and natural hazards is becoming more evident among the communities in Berkshire County, Massachusetts. Responding to this need, the Town of Clarksburg pursued the Municipal Vulnerability Preparedness (MVP) program as a follow up to their FEMA Approved Hazard Mitigation Plan.

The Town of Clarksburg is relatively small in size, covering an area of 12.8 square miles (8,187 acres). The town is nestled on the Northern border of Berkshire County adjacent to Vermont and between the Massachusetts towns of Williamstown to the west, Florida to the east, North Adams to the south, and Pownal and Stamford, VT to the north. Developed areas are located in the eastern half of Town boundaries and can generally be broken up into two sections: the Briggsville area that includes Route 8, Town Hall/Police Station and Carson Avenue and the West Cross Road or “Four Corners” section of town, which includes Peter A. Cooke Veterans Memorial Field (aka Town Field), the Community Center (which also serves as the Town’s Senior Center), the Clarksburg School and the library. Between Hoosac Mountain to the east and Bald Mountain to the west flows Hudson Brook and the north branch of the Hoosic River which merge just south of the town line in North Adams. In the northern part of the valley is Clarksburg State Forest Park, operated by the State’s Department of Conservation and Recreation (DCR). The park is home to Mauserts Pond (aka Clarksburg Reservoir) and offers picnicking, hiking, and camping, as well as other recreational activities. Route 8 is the only state route through town and is the main road.

The town has a total estimated population of about 1,657 residents, giving a density of about 130 people per square mile. There are a total of 709 housing units, resulting in a household size of about 2.4 people per household (Census: 2020). The predominate land uses in town are forest (82.5%), residential (6.1%), agricultural (4%), and commercial/industrial (0.3%) (MassGIS, 2010). The town has its own school that covers Pre-K through eighth grade. High school aged go to Drury High or Charles H. McCann Technical High School both in North Adams.

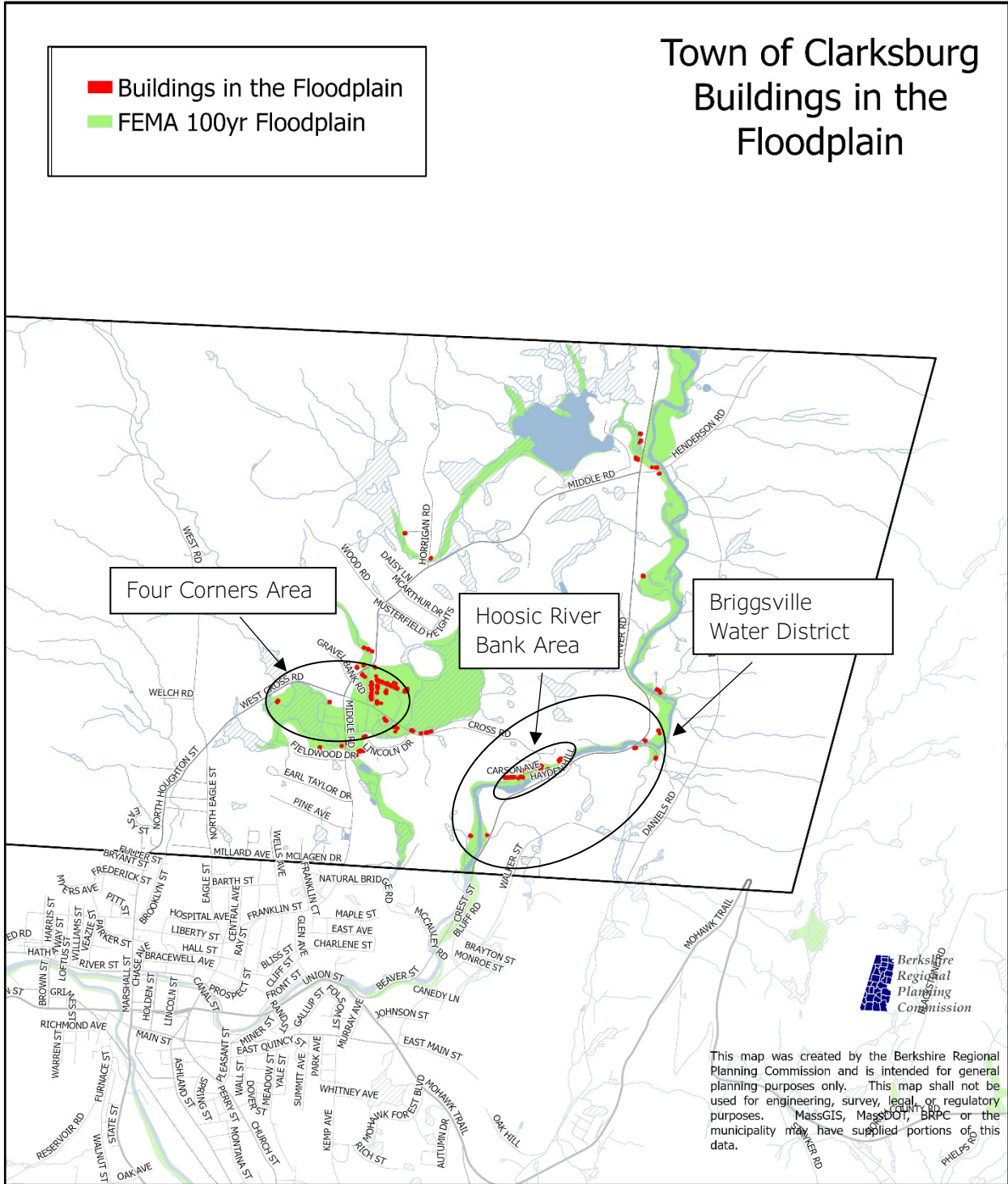
Project Identification and Selection Process

Clarksburg completed and adopted their Hazard Mitigation Plan in 2022. Although the plan included climate change data, this plan was completed independent of the Municipal Vulnerability Preparedness (MVP) Process. Therefore, the Town was awarded MVP Planning funds to complete an MVP Plan.

The town formed a Municipal Vulnerability Preparedness Committee to steer the process. Members of the Committee include municipal department heads and representative from various town boards and committees from several disciplines, along with representatives of key community stakeholders. The town retained the Berkshire Regional Planning Commission (BRPC), an MVP Provider, to aid them in developing an MVP Plan. The objectives of the committee was to 1) Identify top priority hazards caused or exacerbated by climate change; 2) Choose the top three priority actions identified in the Hazard Mitigation Plan, and 3) Develop three of those actions into viable MVP Action Projects. See Figure 1 for locations of the three project areas. This document serves as the MVP Plan summarizing the results of this process.

Approval of this plan by EOEAA will enable the town to become eligible to apply for funding to implement the various preparedness measures identified through this plan development process.

Figure 1: Buildings in the 100-year Floodplain



The Committee held a series of meetings to review the existing Hazard Mitigation Plan, examine more closely the impacts of climate change through localized climate data provided in part by resilientma.org, and discuss areas that will receive the greatest impact. All agreed that increased precipitation and subsequent flooding was the top climate change impact. With this in mind, the Committee identified two geographic areas of concern:

The first area identified was the Briggsville Area adjacent to Carson Ave. Stormwater issues were named in the Hazard Mitigation Plan as a top concern along the steep hillsides of Carson Ave. with rise just west of the main artery, Mass DOT's Route 8. Along with this concern was extreme river erosion and bank failure on the west side of the North Branch Hoosic River. Without bank stabilization on the west bank, the Town and the property owners have seen increased erosion and loss of property. Finally, flooding and the likely event of large storm events put the Briggsville Water District infrastructure at risk.

The second area identified was around Four Corners Floodplain & Town Field. A more detailed description of this area is included below. In short, this area serves as the Town's cultural and community center. It includes the Town's Community Center (which doubles as the Town emergency shelter), Clarksburg School, the Town Library, and the Town Field, a main area of recreation and gathering for town residents and surrounding communities. Cross Road and Middle Road connect the town east to west and north to south respectively. Cross Road links Town hall, located on the east side of town to the school, Senior Center, Town Library and Town Field on the west side of town. Middle Road runs north/south linking residents from the urban center of North Adams to the south and Vermont to the north and vice versa.

In addition to these two areas, the group agreed that an action to address greater communication and community building was direly needed especially in times of emergency.

A 2-hour workshop was held on May 26, 2022, which included the Core Committee members as well as additional stakeholders from the Town Field, Clarksburg School, and neighborhoods surrounding the target areas. A full list of attendees can be found in Table 1. During this workshop, presentations elaborated on the impacts of climate change to the Town, geological, soil and hydrologic information as well as background information on the historic importance, uses and current issues of the two sites.

The committee garnered public feedback through a public survey and open listening session. The survey was made available at the Town Hall, the school library, and the Community Center. An online copy was posted to the Town website. The public listening session was announced through online channels, posted on the Town calendar events page, the Council on Aging page, and the weekly school newsletter. A QR code to the survey and date for the public listening session were mailed to each household in Clarksburg, and announcements were made during Council on Aging events.

HOLD FOR ATTENDANCE AND SURVEY PARTICIPATION

Table 1: List of Attendees

Name	Affiliation
Facilitators	
Courteny Morehouse	Berkshire Regional Planning Commission – Project Coordinator
Justin Gilmore	Berkshire Regional Planning Commission
MVP Core Team	
Carl McKinney	Clarksburg Town Administrator
Bob Norcross	Clarksburg Select Board Member
Lauren Norcross	Clarksburg Director Council on Aging
Clebe Scott	Clarksburg Conservation Commission
Jim Brandon	Clarksburg Conservation Commission & Retired Geologist
Kyle Hurlbut	Clarksburg Dept.of Public Works
Workshop Attendees	
Jeff Levanos	Clarksburg Select Board Member and Resident of Four Corners Area
Emily Rosselli	Clarksburg School Teacher

Findings

Extreme Precipitation Events

The MVP Committee identified extreme precipitation events as the top hazard facing Clarksburg. Extreme precipitation events encompass flooding concerns, increased sedimentation, and the degradation of local roadways due to undersized culverts. There are several flood prone areas in Clarksburg in part due to the elevation of Hoosac Mountain to the east of the town. These flood prone areas include:

- Multiple spots along Carson Avenue and Demers Avenue
- Several locations along River Road/Route 8
- The bridges on Daniels Road and East Road
- Several locations along northern Middle Road prior to connecting with River Road
- The areas between Middle Road, Cross Road, and Lincoln Drive
- Several areas along Houghton Street intersecting with Gates Avenue, Inga Avenue, Gleason Street, and School Street.
- The Peter A. Cook Veterans Memorial Field, referred to as the town field, also suffers flooding issues particularly after rain storms.



Four Corners/Town Field Floodplain Restoration

Background

The four corners area in Clarksburg has seen an increase in water levels over the past thirty years. The RMAT climate data shows that Clarksburg has had a significant increase in rainfall since 1980. Located in the 100-year floodplain, the four corners area is home to the town's Community Center, Clarksburg School, Library, Dept. of Public Works (DPW), two neighborhoods, a sewer pumping station, and Town Field (see Figure 1). In addition to being important for town gatherings, the area provides escape routes and shelter locations for students and faculty through the Town Field and to the Community Center, which functions as the town's emergency shelter. Figure 2 shows the escape route mapped.

Historically, the Town Field and the surrounding area were actively farmed for hay and other crops. During this time, a series of ditches or swales were constructed lining the fields to aid with drainage. The farmers who worked the land would regularly maintain these swales, keeping flooding to a minimum not just in their fields but the surrounding areas as well. As parcels were sold to residential development, maintenance of these swales became haphazard or fell to the wayside altogether. Coupled with the increase in precipitation, improper and sporadic maintenance has led to increase in backyard flooding both on the Town Field and in residents' backyards.

After a significant rainstorm, the Town Field becomes waterlogged and unusable and the Clarksburg School's escape route to the becomes muddy and difficult to use. The base of the driveway to the Community Center has major ponding after every rainstorm and several homes see basement flooding and standing water in their yards after these events. The fire department, police department, and town hall are all on one side of the four corners area and the school, Community Center, and DPW are on the other side. The two-foot bridges that operate as entrances to the park are in poor shape and need of repair or replacement. One bridge connects the parking lot to the Town Field. The other serves as part of the emergency escape route for the school. A major storm with flooding could separate emergency vehicles and services from getting to the emergency shelter and the school isolating a vulnerable population of seniors and almost 200 children. To make matters worse, beavers just upstream of the area along Hudson Brook, have created sporadic flooding issues near the pumping station, an area with limited accessibility. As the climate continues to warm, additional heavy precipitation events will only exacerbate these issues.

Despite these threats, the Town and community groups in Clarksburg continue to invest in development of the Town Field. This work included tree work, the completion of a recent ADA Accessibility Study, and most recently completed repairs on the pavilion include a new roof and regrading for ADA accessibility.

Figure 2: Map of Four Corners/Town Field Project Area



Proposed Solution

The goals of this project include addressing flooding and drainage issues to better manage stormwater throughout the four corners area and to preserve the Town Field and enhance the use of the open space for more residents in Clarksburg and nearby communities. Recommendations will focus on nature-based solutions that improve the detention, retention, and infiltration of stormwater throughout this area.

The design process for this project will make every effort to involve and in some cases be led by the Clarksburg community. To accomplish this, the Town will utilize tried and true methods such as surveys, presentations at existing open meetings, and open listening sessions, as well as more interactive methods of engagement such as a Student Design Challenge and on-site Design Event. More about Community Involvement can be found in the section below. Our objective with this outreach is to determine the best uses for this public space both currently and in the future that meets the needs of the community. For more details on outreach tactics see the Public Involvement and Community Outreach section below. Clarksburg would like to implement suggestions made in the ADA Accessibility Study of the Town Field to increase accessibility. An ideal end design will include the conceptual designs for better stormwater control as well as park design elements that increase use of the park by visitors and residents of a diverse backgrounds.

Timeline, Scope, and Budget

To make these improvements, cleaning the existing swales, creating a natural detention and retention area for water to pond, replacing walking bridges between the town field parking lot and the school, and re-envisioning the field use for the betterment of Clarksburg and surrounding towns. The Town expects the project to be completed in three phases:

Phase I: Project Design

With secured funding, the Town of Clarksburg will hire an open-space landscape designer to lead the Town through a park design process. The design process will address drainage issues, restore floodplain function and lead the community in process that rethinks how the park can best serve the community. An important element of this phase will be resident and visitor engagement. See the outreach section below for proposed outreach activities.

Time: 2 years

Estimated Budget: \$100,000

Phase II: Final Designs and Permitting

Phase II will take conceptual designs created during Phase I and create final engineering designs for any elements where engineering is needed (ex. bioswales and rain gardens, trails and bridge paths). The Town will work with stakeholders to secure all necessary permits and permissions, including a long-term maintenance plan and easements in order for the town to maintain any structures sited on private property. With final designs, outreach will be conducted to gather input on final design work and feedback integrated prior to implementation.

Time: 2 years

Estimated Budget: \$250,000

Phase III: Implementation & Construction

We foresee the implementation phases of this project in two parts. The first part will address stormwater drainage, and stream restoration. The second will focus on path, bridge, and park designs. What goes into each phase will depend largely on the design plans created and feedback from the community during Phase I & II.

Time: 5-8 years

Estimated Budget: \$1.5 million

Nature-Based Solutions and Environmental Co-Benefits

This project would preserve the town field, school emergency exit trail, and wetlands to the east of the town field while maintaining access to those seeking shelter. There is enthusiasm for developing open space include nature trail that would highlight overlook and the wild wetland areas. Design solutions to retain and infiltrate stormwater in these areas will include the creation of strategically located bioswales, rain gardens, and other nature-based stormwater management methods. These nature-based design solutions provide the desired flood mitigation functions while also providing habitat for pollinators and birds.

Environmental Justice and Public/Regional Benefits

The importance of the Town Field area with the Community Center cannot be understated. Clarksburg does not have a church, post office, coffee shop, gas station, general store, or any other sort of

community gathering spot. All outside town functions are held at the town field. Though Clarksburg does not have any EJ populations within its municipal borders, preserving the Town Field area and maintaining safe travel routes to the community center (emergency shelter) and escape routes for the school to the town field would be immensely beneficial to seniors and children in the town. The Community Center offers several outreach programs, and the building is utilized by many residents, including by those 60 years of age or older. Children from all communities surrounding Clarksburg (including from the City of North Adams, a majority of which is designated as an EJ community) use the town's little league field, basketball courts, and pavilion.

Public Involvement and Community Engagement

To get broad participation, the core planning team consists of Council on Aging, the Clarksburg School, Veterans of Foreign Wars, Conservation Commission, Select Board, and Town Administration. The core team will be instrumental in organizing and recruiting participants to public listening and information sessions, creating, and encouraging broad participation in a survey that asks community members what they like to see in the park design. During the planning process the core team gathered a mailing list of residents and nearby community members many of whom signed up through Council on Aging and school research. This list will continue to be build on to provide newsletter style updates on the project as it progresses.

To specifically engage youth in the project, the project team will work with Clarksburg School staff to run a student design challenge in the 6th and 7th grade Science Classes. Clarksburg School will do this by hiring Flying Cloud Institute, a science and art nonprofit who will bring in scientists to teach soil and earth sciences, the impact of soil and geology on hydrology, how this will look different during Climate Change. Students will be tasked with designing solutions to the drainage of the Four Corners area that serve both people and preserve or restore floodplain function. Artists will work with the students to create the visions they come up. Designs that students create with will be presented at the Town-wide Design Event/Celebration.

The Design Event will be held at the Town Field and include tables to educate residents and visitors about site background and issues. Feedback stations will be set up around the area at key locations such as the school escape route, the Community Center, the walking bridges, and the pavilion. These feedback stations will include interactive feedback set up (ex. a white board or clay model station), facilitator and prompts to get participants to imagine what they want out of the project. Local food vendors and music will be hired to draw people in and the event will be integrated into the Town's 225th Anniversary when people will be coming out to celebrate. Input from this event will be recorded and integrated into the conceptual designs, then presented during at subsequent meetings and listening sessions.

The project feedback will be wrapped up with a survey. The survey will present the ideas that floated to the top throughout the course of project design and engagement. It will ask for feedback on those designs and allow community to vote on their favorite aspects of the design. This feedback will be integrated into the final conceptual designs.

Table 2: Four Corners Outreach

Four Corners Water Management and Preservation of Town Field Public Involvement and Community Engagement Plan Table Summary (summarized version of narrative)			
	Print	Digital	In-Person
Principal Strategies	Set up informational material at the town library, council on aging, and town hall. Hard copy with hard copy surveys.	Email newsletter to mailing list. Online survey	Design event held at the project site during the Town 225 th anniversary. In-school design challenge at Clarksburg School.
Assisting Strategies	Postcard mailing .	Outreach through town websites and invitations.	Info/Listening Sessions
Equitable Engagement Modifiers	Expand mailing to nearby communities as possible.	Partner with North Adams community groups to share with social media groups and relevant email lists	Focus on school and council on aging engagement
<p>How community feedback will be incorporated into project and mechanism by which results will be shared:</p> <p>Community feedback will ultimately shape the details of the desired improvements that will guide the town’s funding request. Resident feedback and other stakeholder input will be documented in the designs that will be made available on the town’s website, through newsletter outreach, etc.. Presentations at listening sessions will include feedback that’s been integrated into the plans. A final survey will incorporate community ranking of designs elements. The outreach process will be included as an appendix to the conceptual design report.</p>			

Project Transferability, Measurement of Success, and Maintenance

Quantitative metrics for measuring project success will include the number of basements that no longer experience flooding issues, increased floodplain storage, and increased access of the Four Corner area resources. A qualitative metric that may be harder to quantify is to increasing community cohesion through this community project. Improving the Four Corners area will allow residents, visitors, and the town to utilize the surrounding facilities more fully and consistently which will naturally increase the number of social gatherings, town programmed events, sports leagues, and other recreational opportunities. More opportunities to engage fellow residents through the use of these facilities enhances the likelihood of strengthening community bonds.

To maintain this project in the long term, an operations and maintenance plan will be developed for the Town Dept. of Public Works. Part of this project will include the formation of maintenance easements, donation or possible purchase of private property that contribute to watershed drainage impacting the Town field.

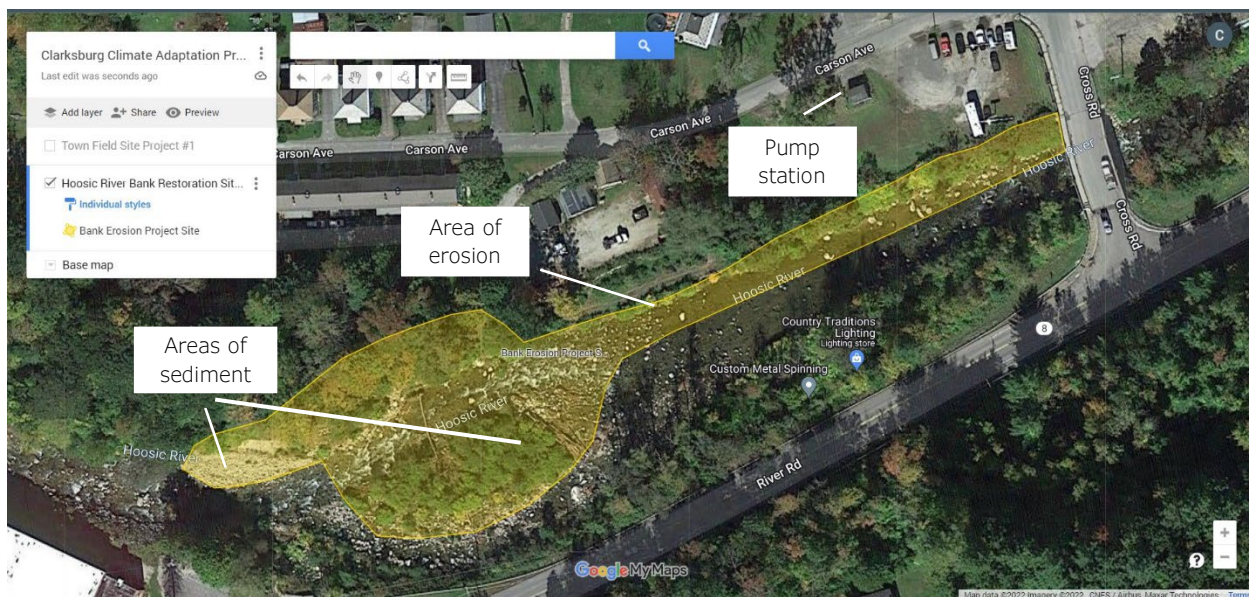


Hoosic River Bank Erosion & Stream Restoration

Background

The Briggsville Area of Clarksburg is located around Carson Ave and River Road (Rt. 8) as it runs along the eastern/southern side of the North Branch Hoosic River. Homes and businesses are located along Carson Avenue and Carson’s junction with Cross Road at the Mary Baker Bridge. Clarksburg Town Hall which holds the police station and administrative offices is located just south of Mary Baker Bridge on River Road. Steep sloping from Cross Road down past Demers and Carson Avenue, into the Hoosic River can cause forceful stormwater flows especially during heavier precipitation events causing erosion and overtopping of undersized culverts. Active erosion and bank failure along the northern bank of the North Branch Hoosic River. The eroded section stretches from Mary Baker Bridge to the site of the now removed Briggsville Dam (adjacent to the end of Carson Ave).

Figure 3: Hoosic River Bank Restoration Site Map



The North Branch Hoosic River is a dynamic river prone to extremely high flows and volumes of water during spring snow melt season and times of extreme precipitation events. The river channel is narrow with high banks on both sides. With those flows comes a history of erosion and deposition in the river just upstream of the former Briggsville Dam. Riprap, debris, and other materials periodically dislodge during flooding events and move downstream. Powerful floodwaters eroding the banks along Route 8/River Road have been fixed with frequent re-armoring of the riverbank and repairs to the roadway. According to historic newspaper reports, several repair projects involving adding fill and asphalt to the sinking road surface and armoring the bank with riprap have been conducted along the river in the years preceding 1976, 1978-79, 1987, 2011, and 2021. Deposition that comes with this erosion have created two medial bar islands, mid-stream in the river above and below the old Briggsville Dam site. In 2005, the bar became more of an island, presumably due to a combination of normal settling of sediment behind the impoundment and of deposition of cobbles, rock, riprap, and debris during successive high flow events.

In the 80's two events contributed to the buildup of this island. Flooding in 1984 dislodged and moved downstream much of the limestone riprap that was installed in the late 1970s, with some flowing over the dam and being deposited downstream and some left behind the dam. In April 1987, several days of downpour caused high floodwaters to rage along the North Branch Hoosic River, flooding and threatening the integrity of Route 8/River Road. Sediment transported downstream accumulated at Briggsville Dam. State and local funding paid for dredging of this sediment and in May 1987 \$148,000 in federal funding was used to install riprap armoring along the bank of the river to protect River Road. According to the newspaper article, local officials were not pleased with the armoring, saying that the riprap used was not large enough to withstand the pressure of flooding, and that other land along the river was still threatened with flooding and erosion.¹ The lightweight limestone for this riprap came from the local mining operation in Adams. This material eventually dislodged and distributed downstream over a series of flood events, much of which contributed to a medial deposition bar in the middle of the river. An additional \$415,000 awarded to the town repaired other sustained damages across Clarksburg, including repairing roads (such as washed-out West Road) and waterways.

In 2010, the State via the Department of Ecological Restoration (MassDER) and a number of environmental organizations removed the deteriorating Briggsville Dam opening 30 miles of aquatic habitat and cold-water fisheries and removing the ongoing potential flood risk. At 145 feet long and 15 feet high, the Briggsville Dam largest dam removed in the State of Massachusetts in its time. As part of this work, built-up sediment from behind the dam was removed, the river channel was dug out and newly exposed riverbank was planted with vegetation to anchor the banks. Unfortunately, bank stabilization efforts were compromised closely following these efforts as Tropical Storm Irene swooped through the area in a few months later in August 2011.

Figure 4: River Rd/Route 8 Damage from T.S. Irene



Like much of the area, T.S. Irene hammered Clarksburg, causing town-wide flooding of roads, properties and homes. Although the North Branch Hoosic River generally flows through a deep and steep channel, the flood waters filled the channel to the very top of the bank. Where the river flows

¹ Sweet, William, 12-27-87. "Storms Swell in Clarksburg: from Skies and in Town Hall," *North Adams Transcript*.

alongside River Road/Route 8, riprap and bank armoring washed away and severe erosion of both sides of the banks occurred. A portion of the west lane of River Road/Route 8 collapsed into the river and debris deposited downstream (see Figure 2). Much of the work completed by the Briggsville Dam removal was undone as T.S. Irene flows caused river erosion so severe it stripped away newly planted bank vegetation, exposing glacial soils along the eroded northern bank of the North Branch Hoosic next to properties located on Carson Avenue. Additional erosion and deposition occurred during Hurricane Sandy in 2012. This erosion continues with each successive flood event.

The mid-bar island has existed so long that shrubs and trees have become established on it. The southern bank of the river is armored to protect the road, but the northern bank is not armored. Over the course of the years, the island has created a constriction in the river, with the main flow passing on the northern side of the island. During high peak volumes, the water erodes and undercuts the unprotected bank threatening property located on the southern side of Carson Ave. It has been posited by local leaders and some experts that bank erosion has been exacerbated by River Rd./Route 8 armoring that shifts the river's thalweg to the opposite side of the river, causing more active erosion along the exposed north bank. Homes and other structures located along the northern bank of the river could become threatened if the frequency and severity of flood events increase in the future, as is predicted with climate change.

Proposed Solution

The goal of this project is to mitigate erosion and threat to property in the Briggsville area. To accomplish this, project would explore nature-based solutions for bank stabilization along the northern bank of the North Branch Hoosic River.

After some consultation with a staff member at MassDER who worked on the Briggsville Dam removal, it was suggested the following actions could be taken to address erosion.

- 1) After completing a Notice of Intent to operate under the Wetlands Protection Act. An excavator would be hired to move medium to larger-sized rocks and boulders from the island river right and place them along the foot of the northern bank, matching the upstream natural reaches. This would act as bank stabilization and deepen the flow so that it is spread less widely therefore impacting the northern bank. In areas where rocks are not able to be placed, namely at the middle and top of the bank, volunteers and the Town would do live staking of native, riparian plants such as willow and red osier dogwood which have the ability to establish quickly.
- 2) If this first step fails to reduce erosion, rock veins or root wads can be established at regular intervals upstream of the area. This will slow and redirect flow away from the bank. For this second phase, an engineering firm would need to be hired to design the mitigation, suggest materials, and oversee construction.

To accomplish either of these phases, the Town would seek support from the Berkshire Clean, Cold, Connected Partnership (BCCC), MVP Program, MAssDOT and MassDER. BCCC is a partnership of watershed organizations, environmental non-profits, local and regional government that aims increase the pace and scale of ecological restoration in Berkshire County.

The area is within the Wetlands Protection Act Riverfront Protection thus requires an Notice of Intent approval from local Conservation Commission. It is also listed as a Massachusetts Natural Heritage &

Endangered Species Program (NHESP) Estimated Habitat of Rare Wildlife and Priority Habitat of Rare Species. Thus, additional would require an additional NHESP consultation and survey and MEPA review. Any endangered or rare species and/or habitat present will necessitate additional planning and accommodation to ensure that work performed has minimal impact.

Timeline, Scope, and Budget

This project will be a multi-year project conducted in two phases:

Phase 1: Planning & Outreach

The first step to the Briggsville Stream Restoration Project is to characterize the issue. To accomplish this, several stakeholders need to be brought together including:

- Town Administration, MVP Core Team, and Conservation Commission
- Trout Unlimited and Massachusetts Dept. of Ecological Restoration (MassDER) who were instrumental in the Briggsville Dam removal
- Massachusetts Dept. of Transportation (MassDOT) who owns and manages Route 8 across from the site and who are responsible for armoring the bank. Any decision about solutions should take into account how it impacts this North/South corridor of Route 8.
- Abutting properties along Carson Ave. and directly downstream
- Berkshire Clean, Cold and Connected Partnership (BCCC) – includes watershed organizations and regional entities such as Berkshire Regional Planning Commission, Hoosic River Revival, and Hoosic River Watershed Association
- Engineering Consultant to design solutions

The bulk of public engagement and outreach will be front-loaded into this first phase. The section below describes the Public Involvement and Community Engagement in more detail. The end deliverable will be complete conceptual designs inclusive of community input and presented to community groups.

Time: 1 years

Estimated Budget: \$50,000

Phase 2: Engineering & Permitting

Phase 2 will progress the stream restoration conceptual designs to final engineering and permitting. Outreach will take a similar approach, engaging stakeholders in project progress, gathering input, and integrating it into final design plans. Permitting is expected to include an Wetlands Protection Act NOI, and NHESP/MEPA review.

Time: 1 year

Estimated Budget: \$80,000

Phase 3: Implementation

Phase 3 will involve implementation of design plans. To accomplish this, the town will procure a contractor with experience in nature-based bank stabilization projects through a bid process. Once selected the contract will work with the project team to complete project details according to the designs plan.

Time: 2 years

Estimated Budget: TBD \$250,000

Nature-Based Solutions and Environmental Co-Benefits

Solutions to stream restoration will include nature-based solutions that enhance habitat health while minimizing erosion over the long term. These solutions include bank armoring with natural sized, local boulders, live staking, racine plantings, rock vein and/or root wad installation to name a few. Decreasing the erosion will improve native brook trout habitat, especially important in this area due as a cold-water fishery that should be protected as a climate cold-stream refuge. Plantings will increase shade of shoreline and aid in carbon sequestration.

Environmental Justice and Public/Regional Benefits

Clarksburg is the upstream community of Environmental Justice communities in North Adams, the community that the North Branch Hoosic River flows through. Given its proximity, the health of the river at Briggsville both in terms of habitat and water quality impact the health of the river downstream. Moreover, Clarksburg provides accessible outdoor recreation to nearby communities in North Adams who live just down the street of fishing, hiking and natural spaces located in Clarksburg.

Public Involvement and Community Engagement

Throughout the project, the Town will engage residents and nearby communities in solutions with a series of interviews, surveys, and Town Hall meetings. Regular updates on project progress will be presented at Select Board meetings, Conservation Commission meetings, and community group listening sessions. This location and the North Branch Hoosic River is a popular fishing spot, for this reason, outreach will include interviews and surveys of fishers. The Town will recruit and hire someone in the fishing community to survey visitors during busy fishing hours. In addition, the Town would like to organize a fishing derby to bring attention to this location and get feedback on the planned project.

Feedback will be especially important in Phases I and II so that concerns and ideas are incorporated into the stream restoration design as appropriate. Volunteer opportunities will be incorporated in the implementation where appropriate. For example, live staking/planting of buffer areas will be organized. For example, the Town will organize a community planting day that recruits students from the local school and the larger Clarksburg/North Adams community.

Table 3: Hoosic Bank Restoration Outreach

Hoosic River Bank Restoration Public Involvement and Community Engagement Plan Table Summary (summarized version of narrative)			
	Print	Digital	In-Person
Principal Strategies	Surveys distributed to residents in public spaces and through community events.	Survey and related information posted on town's website.	In person interviews with fishers about site use and project input. Public listening sessions.
Assisting Strategies	Pamphlets, posters and other informational materials distributed in public spaces	Online outreach of project materials	Presentations at Select Board and Conservation Commission meetings.

<p>Equitable Engagement Modifiers</p>		<p>Partner with North Adams community groups to share with social media groups and relevant email lists</p>	<p>Organize schools field trips and planting activities.</p>
<p>How community feedback will be incorporated into project and mechanism by which results will be shared: Community feedback will ultimately shape the details of the desired improvements and guide the town’s funding request. Resident feedback and other stakeholder input will be documented in the plan that will be made available on the town’s website. Information gathered at listening sessions will be integrated into the plans and changes communicated at subsequent presentations.</p>			

Project Transferability, Measurement of Success, and Maintenance

Post implementation, this project will be monitored to ensure the survival of plantings and effectiveness of erosion control solutions. Should plantings need to be replaced the Town will work with interested volunteers to do so. Our hope is that this project can serve as an example stream restoration project in the state that addresses increased erosion from higher river flows.



Briggsville Water District: Flood & Drought Resilience

Background

The Briggsville Water District provides drinking water for 10% of the Town; 68 households, four industries, three commercial facilities, and Clarksburg Town Hall. The district is entirely gravity fed from Red Mills Spring, located along Massachusetts Route 8, 0.9 miles north from the North Adams/Clarksburg border with pipes running south to properties along Route 8. The Red Mills Spring has been studied by the USGS² and was notable for its good water quality and being the second most productive spring in Massachusetts among those used for public water supply.

The water system includes 7,100 linear feet of water main piping, 2,100 linear feet of lateral piping, a 2,800-gallon storage tank, water system master meter, and sodium hypochlorite disinfection system located in a room within the storage tank building. The 6-inch main branch line runs from the storage tank building south along Route 8, crossing the river at Cross Street to connect 18 services on the west side of the river. A map of the current system is shown in Figure 5. Portions of the District system including the main line and storage tank building are located within the Hoosic River 100-year flood zone see Figure 1. This puts the system at risk for larger more frequent storm events predicted from climate change.

The elevation of the existing water tank at approximately 1,030 ft (NAD 83) limits the service area to elevations below 961 feet if the minimum recommended household pressure of 30 psi is to be maintained. For this reason, some services have installed their own pressure booster pumps to obtain a workable household water pressure. Issues with freezing water services have been noted near the higher elevations of the system at Hayden Hill Road due to low pressure. A drywell was constructed at the Town Hall to receive a steady trickle of water which is left running from a basement faucet, which acts to prevent stagnation of water in the lines when not being actively used.

The water mains of the District's water system was constructed in 1980, when the District was first formed, including the concrete tank and approximately 5,500 feet of 6-inch pipe and 2,000 feet of 2-inch galvanized steel pipe. Most of the 63 individual service lines to users were installed prior to 1980, with many of the lateral service lines dating to the 1940's and 1950's.

The system's water storage is currently undersized and doesn't meet the requirements of a two-day supply per the Mass Department of Environmental Protection (MassDEP). Clarksburg does not have fire

² Hansen, Bruce P. and Smith, Kirk P. (2008), Characteristics of and Area Contributing Recharge to Public-Supply Springs in Massachusetts, Water-Resources Investigation Report 03-4266, USGS & MassDEP

hydrants to provide water during emergencies and the District's water system has no emergency water source for fire protection during a system failure. Currently, Clarksburg Fire Department fills their mobile tanker trucks with water from streams, rivers, and lakes. Not only does this impact stream habitat and wildlife, but it can harm the Fire Department equipment taking sands, salts and other debris into their equipment. A Consent Order from MassDEP issued on August 17, 2016, requires the District to provide a minimum two days potable water storage in the event of a water system outage. According to recent water system demands identified by the master meter, the District will require approximately 28,000 - 30,000 gallons of potable water storage in addition to water storage capacity desired for fire protection capacity to fill tanker trucks in the event of a fire. These issues are of particular concern during climate change predicted droughts and increased likelihood of fire in Clarksburg's vast forested areas.

While the water mains themselves do not often break, the operations staff report frequent breaks in the individual water service lines. Many of which pre-date the installation of the 6-inch water main. The service lines as well as the galvanized steel pipe need replacement. Additionally, not all service/lateral lines have shut-offs and none have meters.

Proposed Solution

The Briggsville Water District would like fix ongoing issues cited in the DEP administrative order as well as improve system design to be mitigate potential hazards and improve climate resilience. In rebuilding the system, the District would like to install a 40,000-gallon water storage tank to provide a more than two days of back up water storage in case of drought conditions and low spring flow and a 10,000-gallon fire tanker storage or installation of a fire tanker fill point.

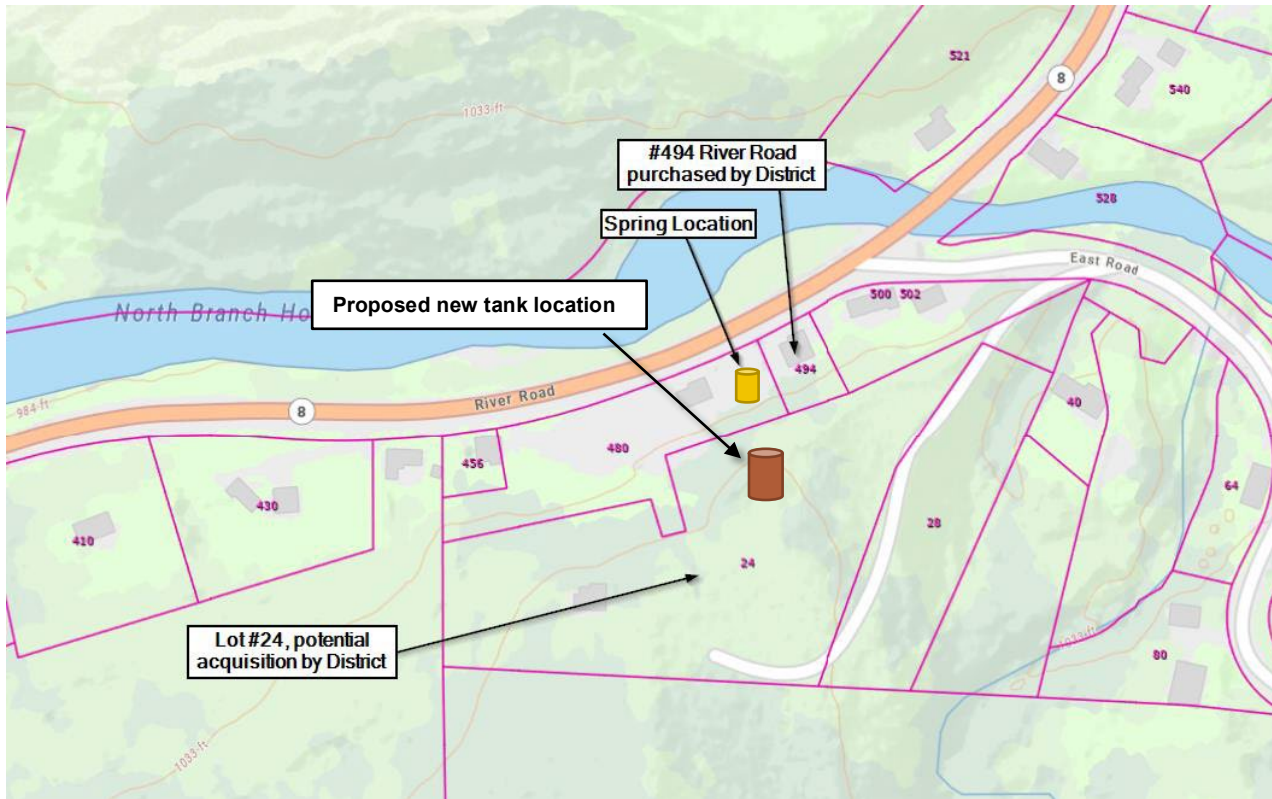
The District has already purchased on abutting property (Lot 22) along Route 8 and seeks to acquire the adjacent property (Lot 24) located out of the Hoosic River Floodplain (see Figure 6). This would allow the District to locate storage tanks and infrastructure outside the Hoosic River Floodplain on Lot 24, 60 ft higher in elevation resulting in higher pressure (78 psi at the lowest elevation - town hall). This would mean building ~1,000 additional linear of the 6-inch water main.

The District would like to replace all 6-inch water main - approx. 5,500 linear feet and all 2-inch and 1-inch galvanized steel water main - approx. 2,100 linear feet including all 68 water connections with water meters. During this replacement, the district will install shut off valves (not currently in place) to allow greater control during maintenance, repairs and line breaks should they occur, and water meters at each connection too.

Figure 5: Briggsville Water System



Figure 6: Briggsville Water District Current and Future Tank Locations



Timeline, Scope, and Budget

This project will be a multi-year project completed in at least two phases:

Phase I: Engineering & Permitting

A preliminary engineering study has been completed to help the Clarksburg Water District determine viable alternatives to upgrades. An alternative was chosen to replace a large section of the water main, lateral lines, install meter and shut-off valves, and relocate the tank to an adjacent property. With funding secured, the District will procure an engineering firm to complete final designs and help secure permits. Based on the work described the District expects to need the following permits:

- 310 CMR 10.00 Wetlands Protection Act – Notice of Intent (NOI)
- MGL Chapter 91 Waterways – Request for Determination of Applicability
- US EPA – Construction General Permit Stormwater Pollution Protection Plan and eNOI

This phase will include land acquisition of the higher elevation abutting the current District tank building site, which the owner has agreed to sell. Outreach and public engagement will be implemented as described in the section below.

Time: 2 years

Estimated Budget: \$640,800

Phase II: Implementation & Construction

With complete engineering, permits in place, and appropriate funding, the District will go through bid procurement to secure a construction contractor. The engineers who created final designs will oversee the project construction to ensure accuracy to the plans and navigate any changes that may arise. Upon selection of a contractor, The District will issue a notice of award, receive bonds and insurance, and execute an agreement and attorney's statement. A pre-construction meeting will be held to, go over the scope details of the project, answer any questions, secure final signatures and issue a notice to proceed. In ground construction is expected to take 3 – 6 months. Updates on project progress will be conducted in public forums and with appropriate town boards throughout the course of the project.

Time: 2 years

Estimated Costs: \$3,130,200

It should be noted that the District plans to pull from several funding sources to complete the full scope of construction. Potential funding sources include rate increases for District services, USDA Clean Water Funding, FEMA Hazard Mitigation Grant Funding, Rural Communities Economic Development Grant, Massachusetts State Clean Water Revolving Loan fund, as well as MVP Action Grant. MVP funds would be used to focus efforts on upgrades to drought resilience and fire suppression preparedness and increase public engagement and outreach.

Environmental and Social Co-Benefits

This project will fix three main issues with the current system. Existing vinyl-lined asbestos cement pipe will be removed and replaced with a new 6-inch water main. The existing pipes were phased out of production in the late 1970's once tetrachloroethylene (also known as perchloroethylene or PCE) was found to leach from the lining. According to studies asbestos in drinking water can lead to an increased risk of cancer, in particular mesothelioma – an aggressive and often deadly form of cancer of the thin lining of the lung, chest, abdomen and the heart.³ Under the Safe Drinking Water Act, asbestos is limited to 7 million fibers per liter (MFL). The EPA states those who consume water with higher than that amount over extended periods may face an increased risk of developing benign intestinal polyps.

The water treatment system is a sodium hypochlorite disinfection system. According to the MassDEP Administrative Consent Order, the feed pump of the disinfection control system has a chemical pump that is not interlocked with flow or concentration. It's unclear whether this system is properly managing disinfection and in 2013 a water sample tested positive for E. coli and total coliform. Replacing this system during the project will make necessary upgrades that will ensure healthy drinking water free of bacterial pollutants.

The current system has the potential to have an impact on local water resources. Administrative Consent Order noted that a floor drain in the disinfection room of the water tank building discharged to a feeder stream of the Hoosic River. Should there be an issue in the tank room, or if pollutants were to wash down this drain it would feed directly into the North Branch Hoosic River. In addition, there have been 15 recorded line breaks leaking mildly chlorinated water in close proximity to the Hoosic River. These may have little impact on a small scale but replacing these lines and installing lateral controls would help reduce chlorinated water from entering into the Hoosic River and having an environmental impact while at the same time allowing the ability to isolate lateral line breaks/leaks from the main system. It is these breaks which tend to drain the whole water system, thus interrupting regular water service for some of the more elevated users of the water system.

³ EPA. Health Effects of Asbestos. <https://www.epa.gov/asbestos/learn-about-asbestos#effects>

The system is entirely gravity fed with a minimal drop in elevation from the spring pump house to the furthest service, Town Hall. Due to low pressure, the Town Hall has to have a constant trickle of water in the basement which gets drained to a dry well in the basement. With a system built at a higher elevation, the pressure can be increased so that this water is not wasted and instead conserved and stored for drought scenarios.

Environmental Justice and Public/Regional Benefits

This project services businesses as well as a number of low-income households in the Briggsville area. This project will fix ongoing problems and provide a more secure water supply.

With a tank located at a higher elevation, it is suspected that the Red Mills Spring could provide enough water and pressure to supply clean drinking water to Environmental Justice Communities in bordering North Adams neighborhoods. However, this has not been verified through a study and North Adams has not expressed interest in switching over its water supply. This project would at minimum leave the door open to expanding in the future should North Adams need to increase, diversity or change its water supply.

Public Involvement and Community Engagement

The focus of this project is on drought and fire resiliency. As such public involvement and community engagement will revolve around these subjects. Outreach materials will be developed to educate residents on what they can do to reduce their fire risk and create drought resilient systems on their properties. This will include a booklet and StoryMap household guide on drought resilient and fire safe practices to practice. Regular updates will be provided through a quarterly newsletter that goes out to the email list started through the planning process, and be mailed with quarterly water bill to services. Moreover, the Town would like to pilot a low cost/free rain barrels equipment and installation program for interested residents. Engagement will include partnership with the Clarksburg Fire Department during their annual door-to-door fundraiser and throughout the year. Finally, Clarksburg would like to introduce drought resiliency planning through classroom lessons on local challenges and planning for Climate Change impacts.

Table 4: Briggsville Water Upgrades Outreach

Briggsville Water District Upgrades Public Involvement and Community Engagement Plan Table Summary (summarized version of narrative)			
	Print	Digital	In-Person
Principal Strategies	Booklet/guide on drought resilient strategies at home & fire safe practices	Develop an email list for Briggsville Water District to provide updates during the process	Rain barrell installation program
Assisting Strategies	Outreach materials to go to residents during Fire Dept. fundraiser.	Posts to facebook and Town website. StoryMap of project and drought resilience at home.	Listening sessions

Equitable Engagement Modifiers			Lesson plans and activities at Clarksburg School on drought resilience and planning for Climate Change
<p>How community feedback will be incorporated into project and mechanism by which results will be shared: Public forums will be held periodically during the design period. Feedback will be integrated into design plans with a note to the change where appropriate.</p>			

Project Transferability, Measurement of Success, and Maintenance

Improvements to the Briggsville Water District will be successful when they meet the following milestones:

- The Clarksburg Fire Department can use tanked water storage during fire emergencies;
- There exists enough water storage for drought conditions;
- MassDEP lifts the Administrative Order based on upgrades to the system. This will indicate that the system is in compliance with current drinking water regulations;
- Servicees experience sufficient water pressure and eliminate the need for individual pump stations.

To pay for and maintain the system Briggsville Water District is looking into raising rates to hire and/or train a qualified person.