February 2020

TOWN OF GROVELAND

COMMUNITY RESILIENCE BUILDING WORKSHOP
SUMMARY OF FINDINGS

Prepared for:

Town of Groveland
Town Hall, 183 Main Street
Groveland, MA 01834

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Note: *This report has been prepared in accordance with the Community Resilience Building (CRB) Guide and Municipal Vulnerability Program (MVP) "Summary of Findings Template Guidance" provided by the Massachusetts Executive Office of Energy and Environmental Affairs (MA EEA).*

1. Background Information

1.1 MVP Program Overview

In 2016, Massachusetts Governor Charles Baker issued Executive Order 569 (2016) to establish a comprehensive statewide approach to reduce greenhouse gas emissions and prepare for the impacts of climate change. As part of this initiative, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) administers the Municipal Vulnerability Preparedness (MVP) Program. The MVP Program provides communities with funding to identify vulnerabilities and develop plans to increase climate change resilience. In 2018, a $2.4 billion Environmental Bond Bill authorized over $200 million to fund climate change adaptation, including both planning and implementation aspects of the MVP Program.

To date, 249 of the Commonwealth's 351 municipalities (71%) have participated in the MVP Program. This has resulted in more than $17 million dollars in Planning Grants and Action Grants to implement high priority actions identified during the planning process. Projects funded through Action Grants are wide ranging, including the following priority project categories:

- More detailed vulnerability and risk assessments;
- Community outreach and education projects;
- Local bylaw updates;
- Redesign and retrofits of infrastructure;
- Nature-based solutions for flood protection, drought mitigation, and water quality improvements;
- Nature-based infrastructure and technology solutions for extreme heat and poor air quality.

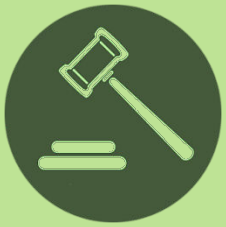
1.2 Community Resilience Building Workshop

The Town of Groveland (Town) received funding through a MVP Planning Grant to compile data for and conduct a Community Resiliency Building (CRB) workshop. The goal of the CRB workshop was to have community stakeholders work collaboratively to complete a climate change and natural hazard vulnerability assessment and develop prioritized actions to address vulnerabilities and improve strengths. Upon completion of the CRB workshop process, Groveland will become an "MVP Community" and will be eligible to apply for MVP Action Grant funding from the Commonwealth.

An interdisciplinary team of Town staff (i.e., "Core Team") worked to implement the CRB process with consulting support from Comprehensive Environmental, Inc. (CEI), a certified MVP provider. The Town's MVP Core Team included the following:

Town of Groveland – MVP Core Team
Rebecca Oldham, Town Planner
Mike Dempsey, Conservation Commission
Denise Dembkoski, Finance Director
Steve Sargent, Emergency Management Director
Renny Carroll, Highway Superintendent
Colin Stokes, Water and Sewer Superintendent

Regulatory Updates: As part of this MVP Planning Grant, the Town received funding to update its Stormwater Management and Land Disturbance Bylaws. CEI met with the Groveland Town Planner on several occasions throughout the grant period to discuss required regulatory updates and recommend changes in order to comply with the National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II permit. Key goals of this effort were to **reduce flooding impacts** from new development while increasing aquifer recharge and **improving water quality**.



Although the Town had previously adopted regulations to meet the 2003 permit, the new 2016 permit contained a number of changes that must be addressed in Groveland's bylaws. In response, the Town has developed draft bylaw revisions to meet MS4 permit requirements to address illicit discharges (Minimum Measure 3), erosion and sediment controls (Minimum Measure 4), and post-construction stormwater runoff (Minimum Measure 5).

At the end of 2019, the U.S. Environmental Protection Agency released revised sections of the MS4 Permit that in part impacted the Town's draft bylaw revisions completed to date. The most substantial change was to the stormwater standards that were previously incorporated into the Town bylaws. The Town addressed the revised permit by drafting updates to appropriate sections in the Town's bylaws. These revisions were recently reviewed by eCode (the Town's online regulatory host) for legal compliance. The updated bylaws are currently scheduled for vote at Groveland's spring 2020 Town Meeting.

See **Appendix D** for proposed revisions to Town bylaws.

1.3 Workshop Preparation

The following tasks were performed to prepare for the CRB workshop:

- The Core Team and CEI held a kickoff meeting on September 19, 2019 to plan for the workshop.
- CEI conducted interviews with Core Team members to identify potential areas of concern, strengths, and vulnerabilities.
- CEI prepared presentation materials and Town-wide maps to guide the workshop.
- The Core Team scheduled the workshop, invited stakeholders, and handled logistics.

1.4 Workshop Process

A full-day MVP planning workshop was held on December 5th, 2019 in accordance with CRB guidance[1]. The workshop participants are listed below.

[1] CRB Guidance: www.communityresiliencebuilding.com

Name	Department/Committee	Team
Stephen Sargent	Police Department, Emergency Management	Green
Joseph Santapaola	Fire Department	
Robert Valentine	Fire Department Chief	
Colin Stokes	Superintendent, Water and Sewer Dept.	
Rebecca Oldham	Town Planner, Planning Dept.	
Kevin Snow	Manager, Electric Dept.	Blue
Mike Dempsey	Conservation Commission	
Renny Carroll	Superintendent, Highway Dept.	
Claire Walsh	Public Health Nurse, Board of Health	
Rosemary Decie	Conservation Agent	
Bob Hartzel	CEI	Facilitators
Elisha Musgraves	CEI	
David Roman	CEI	

The workshop was initiated with introductory presentation materials. Presentation materials included:

- Description of the MVP program and CRB process;
- Summary of Groveland's emergency management procedures;
- Introduction to climate change, including Groveland-specific climate change projections[2];
- Introduction to nature-based solutions (i.e., green infrastructure);
- Summary of stakeholder interview results.

Stakeholders were then split into diversified sub-groups (5 people per group, see assigned teams in table above) to conduct concurrent guided exercises. As listed below, the exercises solicit and organize input from stakeholders through use of the Risk Matrix presented in Appendix B.

Exercise 1: Identify top local natural and climate-related hazards of concern.

Exercise 2: Identify the Town's strengths and vulnerabilities relative to top hazards.

Exercise 3: Identify and prioritize actions to reduce vulnerabilities or improve strengths.

Exercise 4: Determine the Town's overall top priority actions.

Note: Exercises 1-3 were conducted simultaneously by the sub-groups and Exercise 4 was conducted with all workshop participants to select top priority actions.

To help generate ideas and discussion during the planning exercises, each sub-group was provided a series of base maps (Appendix C) with information such as FEMA flood hazard areas, critical habitat areas, and conservation land within Groveland.

This report provides an overview of workshop findings, including a summary of the Town's top hazards related to climate change, current climate resiliency strengths and vulnerabilities, and potential actions to improve the community's resilience to natural and climate-related hazards. The summary of findings described in this report are compiled from feedback from the workshop stakeholders.

[2] Climate Projections obtained from: www.resilientma.org

2. Top Hazards and Vulnerable Areas

2.1 Summary of Top Hazards

During Exercise 1, stakeholders were divided into two groups to discuss Groveland's top natural hazards and areas of concern. The groups then shared their conclusions and reached consensus on these topics.

The following three hazards were identified as presenting the highest direct and indirect risks to the infrastructure, societal, and environmental resources of Groveland:

Workshop participants identify top hazards

1. **Flooding:** Flooding was the hazard of highest concern to Groveland, as severe storms have caused widespread flooding in the past. An example is the Mother's Day Flood of 2006 which resulted in the closing of Bates Bridge, which crosses the Merrimack River into Haverhill.

2. **Severe Storms:** Extreme weather events such as strong winter storms and heavy rainfall with high winds were another concern due to their potential for damage to infrastructure and other physical, social, and environmental consequences. A local example is a 2006 ice storm that left the Town without power for nearly two weeks.

3. **Extreme Temperatures:** As global temperatures continue along a long-term warming trend, local occurrences of extended periods of extreme temperatures (e.g., consecutive days above 90°F) are predicted to increase. Workshop stakeholders identified extreme temperatures as a top concern, based on the potential for this type of weather to impact vulnerable populations, increase wildfire risks, and other impacts.

2.2 Areas of Concern

Prior to the workshop, interviews were conducted with key stakeholders to develop a preliminary list of Groveland's primary climate resiliency vulnerabilities and strengths. Interviewees indicated that, as a riverside community, flooding and stormwater hazards were the primary concerns for Groveland. Providing adequate emergency sheltering was also a concern of those interviewed. While Groveland technically does have a Hazard Mitigation Plan (Merrimack Valley Region Multi-Hazard Mitigation Plan Update, 2016), interviewees indicated that it is not Town-specific and does not address the effects climate change will have on Groveland.

The table on the following page lists areas of concern that were identified based on stakeholder interviews and feedback during the CRB workshop. Subsequent sections of this report provide more details on strengths and vulnerabilities (and potential solutions to increase resilience) relative to these areas of concern.

Category	Areas of Concern
Infrastructure	• Stormwater conveyance network • Significant hazard dams • Public water supply wells and distribution system • Electrical distribution network
Communities and Villages	• Nichols Village (Senior Living Community) • Whitestone Village (55+ Community) • Groveland Housing Authority (10 River Pines) • Planned affordable housing development (off of Salem Street) • Intersection of Main St. /Washington St. (multiple culverted streams)
Public Facilities	• Schools • Groveland Town Hall • Groveland Fire Department • Groveland Police Headquarters • Department of Public Works
Ecosystems and Waterways	• Groveland Town Forest • Pines Recreation Area • Crane Pond Wildlife Management Area • Johnsons Pond Watershed • Georgetown Rowley State Forest • Meadow Pond Reservation • Merrimack River, Parker River

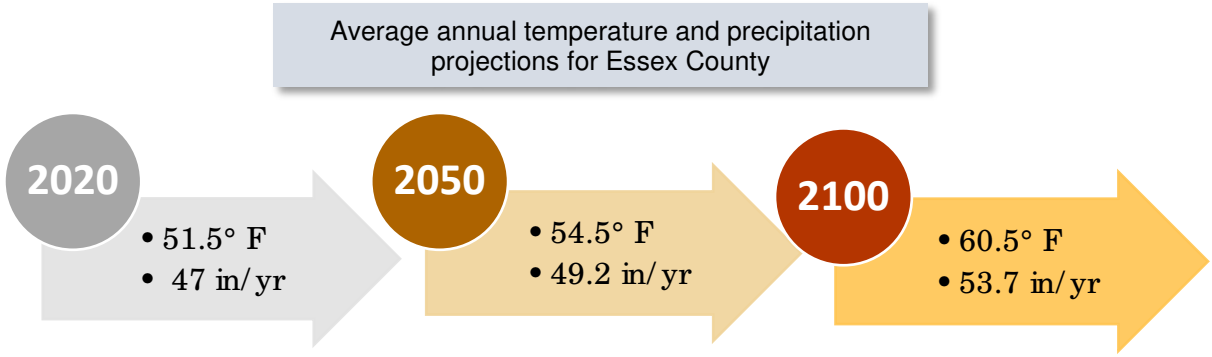
3. Current Concerns and Challenges Presented by Hazards

Groveland faces multiple challenges related to potential impacts from natural hazards. In recent years, the Town has experienced multiple disruptive and damaging weather events, including Tropical Storm Irene (August 2011), Tropical Storm Sandy (October 2012), winter Nor'easter Nemo (February 2013), winter Nor'easter Quinn (March 2018), and Hurricane Barry (August 2019). These storms brought heavy rain-induced inland flooding, wind damage to trees, and snow that caused widespread damage to Groveland and many other Massachusetts communities.

The intensity and frequency of extreme weather events has increased awareness of Groveland's natural hazards and risks associated with climate change, while motivating communities throughout Massachusetts to comprehensively assess and improve resilience at the local level.

The following is a summary of climate change projections for Essex County, Massachusetts from the Climate Change Clearinghouse (CCC) for the Commonwealth (www.resilientma.org):

Note: Climate change projections below are based on median modeled results – some models predict higher and lower outcomes.



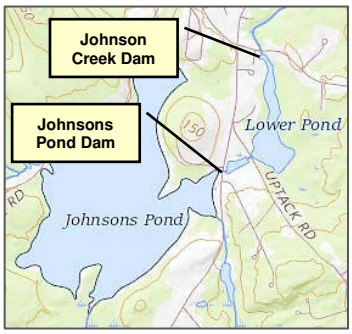
3.1 Categories of Concerns and Challenges

During the guided exercises, workshop participants identified Groveland's vulnerabilities and strengths to natural hazards. As in any community, Groveland is not uniformly vulnerable to potential hazards and climate change impacts – certain locations, resources, and populations will be affected to a greater degree than others. Workshop participants identified the following as key areas of concern across three categories – infrastructure, societal, and environmental.

3.1.1 Infrastructure Concerns

- **Stormwater Infrastructure**: Workshop participants expressed concerns about the Town's stormwater management system. Culverts and other features such as pipes are aging and often undersized throughout town. Specific areas of concern included the following:
  - The intersection of Main Street and Washington Street was identified as prone to flooding, as Johnson Creek and an unnamed tributary converge and are culverted beneath roads.
  - The Center Street culvert was also identified as being particularly prone to flooding.
  - Stormwater outfalls along the Merrimack are displaying signs of scour and/or erosion.

- **Significant Hazard Dams**: Two of the Town's seven dams are classified by the state Office of Dam Safety as Significant Hazard Dams:



    1. **Johnsons Pond Dam** is a hydraulic control for the flow of water between Johnson Pond and Lower Pond. The surrounding area for both ponds is within the 100-year floodplain.
    2. **Johnson Creek Dam** (at Salem Street) is also a hydraulic control within the Johnson Creek area watershed.

  Workshop attendees identified repeat flooding issues in the areas surrounding Johnson Pond and Lower Pond. Stakeholders indicated that there are no floodplain management strategies in place to operate these dams relative to potential future storm events to mitigate flooding impacts.

- **Water Supply**: Groveland's water supply is provided by public town wells, including wells located adjacent to the Merrimack River. This proximity to the river poses flooding risks that could compromise pumping station components. Additionally, high iron and manganese levels in one of the Town's wells requires mixing with an unimpacted well before distribution. Potential climate-induced drought or increases in future pumping could further elevate iron and manganese levels and limit the Town's ability to reliably deliver clean water to customers. The Town is currently conducting an assessment to explore potential alternative supply and/or treatment options.

- **Sewer System Coverage:** Approximately half of Groveland's properties rely on privately owned septic systems to treat wastewater. Failing septic systems are difficult for municipalities to identify and can pose water quality risks, especially in areas prone to flooding. Currently, the northern half of Groveland is serviced by a municipal sewer system. The breakout groups discussed potential options for expanding sewer service to the southern portion of the Town, to prevent water impairments from failing septic systems.

3.1.2 Societal Concerns

- **Hazard Mitigation Planning**: Although Groveland has a Hazard Mitigation Plan (Merrimack Valley Region Multi-Hazard Mitigation Plan Update 2016), interviewees indicated that it is not Town-specific enough to support emergency responses and does not address potential impacts of climate change on Groveland.

- **Vulnerable Communities**: Several vulnerable, densely populated areas were identified during the workshop. Groveland has two senior and adult living facilities: Nichols Village and Whitestone Village. Also, The Groveland Housing Authority at 10 River Pines town-owned housing for low-income residents. These densely-populated sites may pose evacuation challenges or are at risk of being cut off from emergency services in the event of a natural hazard.

- **Emergency Shelters**: The Bagnall School currently serves as an emergency shelter for the Town. Workshop participants stated that more could be done to expand and bolster the school's capacity for handling a large influx of citizens during emergency events, and to improve the shelter's capacity to function for long-term sheltering events.

- **Future Development**: An affordable housing development off of Salem Street is in the permitting

phase. Because of the development's proximity to rare species habitat and wetlands, additional care must be taken to prevent degradation and filling of critical floodplains and core habitat. Participants indicated the importance of protecting these important natural features (i.e., maintaining existing floodplains relative to potential increases in future intense storms). The Town is currently updating bylaws to address these types of issues.

3.1.3 Environmental Concerns

- **Forest Management**: Workshop participants noted that brush fires in conservation areas have posed problems in the past. An increase in invasive pests (i.e., ticks, Asian long-horned beetle, etc.) were also discussed as risks related to increasing temperatures which require forest management measures. Additionally, beaver dams within Johnson Creek and Crane Pond (on Beaver Brook) have created nuisance flood conditions.

- **Land Conservation** / **Habitat Protection**: The eastern border of Groveland is dominated by wetlands which include habitat for state-listed rare and endangered species, including Blanding's turtle, wood turtle, and blue spotted salamander. There are also approximately 50 certified vernal pools throughout the town, mostly concentrated to the east. Protecting these areas is critical for maintaining natural flood storage and protecting biodiversity. These areas are also important as public resources for recreation and education. Continuing to acquire key parcels for additional conservation areas is an ongoing priority for the town of Groveland.

- **Groveland Wells Superfund Site:** The Town is waiting on further analysis from the Groveland Wells Superfund Site to confirm if groundwater and soils are free from contaminants and the land can be readied for reuse. Workshop participants expressed interest in exploring potential land uses for this site, particularly with regard to climate change resilience and accessible green space for public recreation.

- **Snow Storage:** Snow storage areas and de-icers can cause polluted runoff to enter receiving waters, contributing to impaired water quality and decreased flood conveyance capacity due to sediment build-up. Workshop participants indicated that a town-wide examination of designated snow storage areas could benefit protection of water quality, compliance with Massachusetts Wetlands Protection Act regulations, and long-term climate resilience. Appropriate snow storage practices will serve to prevent localized flooding as freeze/thaw cycles shift due to climate change. Additionally, fluctuating temperatures between precipitation events may cause an increase in runoff contaminated with de-icers and sediment, affecting water quality. The use of de-icers was a concern, with participants expressing interest in a risk/benefit analysis for the application of different types of road salt, sand, etc.

- **Habitat and Infrastructure Connectivity:** The potential for re-opening J.B. Little Road was discussed. While it is not a top priority for the town, the re-opening and maintenance of J.B. Little Road could serve to provide better access for residents to the Crane Pond Wildlife Management Area, better access for forestry management, and increased connectivity between Groveland and neighboring communities. This connectivity may serve to reduce traffic stresses on Rt. 113 and Rt. 97 and has the potential to be an additional emergency evacuation route.

4. Current Strengths and Assets

Due to recent experiences with extreme weather, workshop participants were aware of Groveland's strengths and how they relate to its vulnerabilities. It was a clear priority to continue to reinforce and expand these strengths, to increase preparedness and resiliency in the community, and to adapt these strengths to address potential impacts of climate change. Key Town strengths are as follows:

- **Emergency Services:** The Town of Groveland currently has an excellent emergency response track record. Each department has a unique emergency response plan and all personnel are informed of their roles.
- **Conservation Areas:** The Town of Groveland includes approximately 1,620 acres of municipal or state-owned conservation land and open space. Much of this conservation land contains wetlands and regulated floodways, which provide natural flood storage and resiliency to flooding events.
- **Electrical Supply:** The electrical distribution network in Groveland is serviced and maintained by a local municipal electrical department. A town-governed entity is potentially more responsive in the event of an outage, as it serves fewer customers than the major state-wide or regional energy providers. In the past, Groveland Electric has shown itself to be a valuable resource for the Town, particularly during previous ice storms. It was clear during the workshop that Groveland is committed to maintaining and strengthening this locally-run utility and services.
- **Regional Partnerships:** The Town has a strong working relationship with the Merrimack Valley Planning Commission (MVPC). The communities within the Merrimack Valley often work in close cooperation with one another, particularly as it pertains to inter-municipality connectivity (i.e. Bates Bridge and the Merrimack River) and regional planning. Continuing to participate in regional partnerships will serve as a major strength for Groveland. For example, the City of Haverhill has access to a wider pool of resources that may serve a critical purpose in the event of a climate change related emergency.

5. Recommendations to Improve Resilience

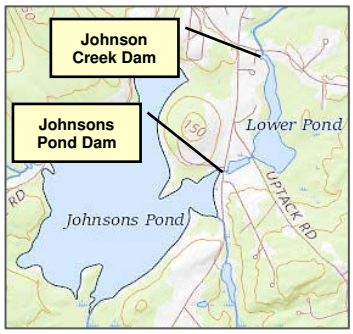
As summarized below, the final step of the workshop was to develop recommended actions to address identified vulnerabilities and to improve strengths.

- Each workshop sub-group identified potential actions and assigned each action a priority (i.e., high, medium, low), then differentiated them as short-term, long-term, or ongoing efforts.
- Each small group selected their top five potential actions, then reported out to the overall stakeholder group.
- The overall stakeholder group then voted to collectively determine the top three actions.

The sections below provide a description of prioritized recommendations developed from the workshop.

5.1 Top Three Recommendations

1. Johnsons Creek Floodplain Management



Johnsons Pond Dam and Johnson Creek Dam represent a significant hazard to Groveland, should either dam experience either a partial or full breach. The area between the two dams (Lower Pond) is a regulatory floodway and provides critical infrastructure to attenuate flooding from rain events and river level fluctuations. There are no existing floodplain management strategies in place to operate these dams relative to potential future storm events to mitigate flooding impacts.

It is recommended that a management plan be developed which incorporates decision support tools to manage these high hazard dams as assets rather than liabilities relative to the Johnson Creek floodplain. The plan could include hydraulic modeling, installation of a monitoring network, and recommendations for decision support / controls for coordinated operation of dams to improve resiliency to future storm events. For example, recommendations may include retrofits to the existing outlet control structures to enable coordinated releases prior to forecast storm events to mitigate potential flooding impacts.

2. Perform Comprehensive Climate Change Vulnerability and Resiliency Assessment

Groveland's current Regional Hazard Mitigation Plan (HMP) was compiled by MVPC. It is recommended that the Town build on the previous regional HMP and findings from the CRB process and perform a comprehensive town-specific climate change vulnerability and resiliency assessment.

The assessment would be structured such that it follows the Federal Emergency Management Agency's (FEMA) required format of a HMP while including additional, more detailed components. For example, the assessment could include some or all of the recommended components for recommendation 3 below, a town-wide stormwater management system vulnerability and resiliency assessment. A FEMA approved HMP would enable the Town to be eligible for future federal post-disaster mitigation funds under the Hazard Mitigation Grant Program (HMGP). A key outcome of the assessment would include a prioritized list of recommendations to improve resiliency, including anticipated planning-level cost estimates which could be incorporated into town-wide capital improvement planning efforts.

3. Town-Wide Stormwater Management System: Vulnerability/Resiliency Assessment

Scour at stormwater outfall to Merrimack River near Bates Bridge.

There are a number of concerns with the Town's stormwater management system, including:

- Aging, deteriorating, and/or undersized culverts/pipes (e.g., Johnson Creek culverts).
- Observed erosion and scour of stormwater outfalls along the Merrimack river.

It is recommended that a Town-wide stormwater infrastructure vulnerability / resiliency assessment be performed. The assessment could include any or all of the following components: interviews with Town personnel, condition inspections, flood modeling relative to potential future higher intensity storms, identification of areas of concern, and prioritized recommendations for repairs / replacements. Recommendations would be structured such that they can be integrated into ongoing or future capital improvement planning efforts.

5.2 Other Prioritized Recommendations

Professional judgement was used to reach consensus on priority for cases in which a recommendation was assigned different priority levels by the workshop sub-groups.

Higher Priority

- Although a Town-wide stormwater management system vulnerability assessment was identified as a top priority, the Johnson Creek culvert at Center Street was separately identified as a known flooding risk. This culvert is within the regulatory floodway. It is recommended that the Center Street culvert be replaced. Replacement steps would include: engineering feasibility analysis (i.e., modeling, conceptual design), permitting, engineering design, and construction.
- Evaluate existing emergency shelter options, then develop a plan to expand and improve emergency shelter capacity. For example, the plan would consider the feasibility of creating additional sheltering facilities, such as the new regional high school or the Groveland Housing Authority at 10 River Pines. The plan could also include recommendations for procurement and installation of emergency generators at existing shelter locations, and expansion of other services provided by the town/affiliated agencies in the event of an emergency.
- Partner with local contractors, equipment owners, and businesses to develop a list of individuals that agree to provide critical equipment (i.e., lighting towers, excavators, etc.) and/or volunteer personnel assistance in the event of a major natural hazard emergency. These providers would be contacted by Town staff in a similar fashion to "Notification Trees", a common emergency management practice.

Moderate Priority

- Improve resiliency against invasive pests. Coordinate with the Massachusetts Department of Conservation and Recreation (DCR) and the Groveland Open Space and Trails Committee to develop a plan and program for controls and remediation.
- Improve resiliency against insect-borne illnesses. Develop and install public education signage at Town-owned recreation properties and areas with heavy foot-traffic. Target key populations by disseminating educational materials with town mailings (taxes, utilities, etc.)

- Develop a protocol that cohesively connects each Town department to strengthen emergency services (i.e., responsibilities, roles, actions).
- The Town Highway Yard is currently located in the 500-year floodplain. Develop alternate egress for the building and perform an evaluation to determine if floodproofing measures would be beneficial (e.g., raising critical utilities, temporary barriers).
- Develop a program for identifying failing privately-owned septic systems as a means to reduce potential water quality impairments. Conduct a feasibility assessment on the potential expansion of the municipal sewer system to areas south of Route 97.
- Perform stormwater management assessment for the intersection of Main Street and Washington Street to reduce flooding risks. The stormwater management assessment could consider potential risks from precipitation events (i.e., runoff) and river flooding. Potential solutions could include recommendations to improve recharge that incorporate nature-based solutions or implementation of floodproofing measures at critical locations.
- Evaluate and update current snow storage areas for WPA compliance, as well as for potential flooding from quick thaw events. Conduct risk/benefit analysis on de-icer use and preventing potential salt loading in waterbodies. Assess impaired water quality areas and determine if continued adjacent snow storage will contribute to impairments. Implement measures (i.e. perimeter controls) to reduce sediment runoff from snow storage areas into receiving waters.
- Increase public education and outreach to community members in South Groveland to address potential flood risks, including identifying areas where flood isolation may occur. Work with community members to ensure that information pertaining to all possible evacuation routes is readily available and up to date.

Lower Priority

- Develop a plan to acquire and expand conservation lands within Town to mitigate potential build-out and subsequent increase in impervious areas. Prioritize habitat and greenway linkage between conservation lands. Increase educational outreach to encourage public use and continue to acquire key parcels to increase connectivity and create wildlife corridors between conservation areas. Forestry management to control invasive pests and brush fire conditions will also serve to protect these assets.
- A municipal power utility substation is located within the current 500-year floodplain. The Town also operates two water supply wells that are in the 100-year floodplain along the Merrimack River. Perform a vulnerability and resiliency assessment for these structures. The assessment could include flood modeling to determine potential impacts from future more intense future storm events, and a plan to increase resiliency through implementation of floodproofing measures. Solutions could include elevation of key components (i.e., controls) at least two feet above the estimated base flood elevation or implementation of other measures such as temporary barriers. This recommendation to perform a vulnerability and resiliency assessment has the potential to be expanded to all key Town-owned and operated structures.
- Conduct a feasibility assessment for re-opening and maintaining J.B. Little Road.
- Continue to implement plan for control of invasive aquatic plants in Johnsons Pond, as warming temperatures will encourage invasive plant growth and ultimately disrupt the ecology of the pond.

As previously discussed, this list of prioritized recommendations was developed by workshop stakeholders based on identified vulnerabilities.

- It is recommended that the Town create a committee or working group to implement recommendations from this plan. Specifically, the committee or working group would develop an anticipated timeline, determine potential funding requirements, then apply for local, state or federal grant funding to implement prioritized recommendations.
- It is also recommended that this report be reviewed and updated annually as actions are completed and/or new needs are identified

6. Report Citation

CEI Consultants (2020). Community Resiliency Building Workshop Summary of Findings. Town of Groveland, Massachusetts.

APPENDIX A

INTRODUCTORY PRESENTATION MATERIALS

Town of Groveland
Municipal Vulnerability Preparedness Program
Community Resiliency Workshop

1

Welcome!

- **Opening remarks**
  - Rebecca Oldham, Town Planner
- **Core Team and Facilitation Team Introduction**

2

Introductions

- **Name**
- **Organization**

3

Workshop Overview

4

MVP Program Overview

Source: https://www.mass.gov/files/documents/2019/07/16/mvp-grant-program-overview-2019-mvp-vendor-training.pdf

5

MVP Process

Obtain Planning Grant

Complete Workshop

- Identify Actions to Address Vulnerabilities
- Write Report

Become Certified MVP Community

- Eligible for Grant Funding to Implement Actions

6

Additional Grant Task: Regulatory Updates

Goal: Update Stormwater Management and Land Disturbance Bylaws.

Key Resilience Outcomes:

- Reduce flooding impacts from development
- Increase aquifer recharge / Meet water quality requirements.

Anticipated Changes: Permit review, construction inspections, provisions to meet water quality standards.

Next Steps: Adoption anticipated at spring 2020 Town Meeting.

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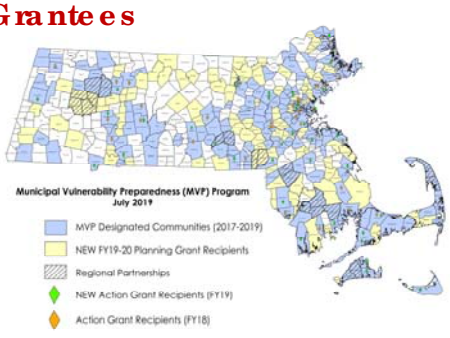
MVP Grantees



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Workshop Purpose

Use the Community Resilience Building (CRB) Workshop Guide to:

- Complete **baseline assessment** of climate change and natural hazard vulnerability
- Develop **specific actions** to address priority hazards/vulnerabilities

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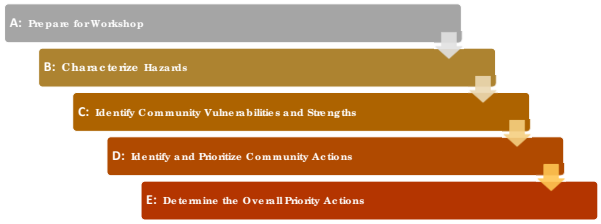
Community Resilience Building Process



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Workshop Agenda

1. **Workshop Overview** ☑
2. **Overview Presentations on Science and Resources**
3. **Exercises**
   - Identify Top Hazards
   - Identify Vulnerabilities and Strengths
   - Identify Actions to Reduce Vulnerabilities and Strengths
   - Identify Top Actions

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Overview Presentations: Science and Resources

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Hazard Mitigation Plan Overview

Steve Sargent
Groveland Emergency Management Director

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Climate Change 101

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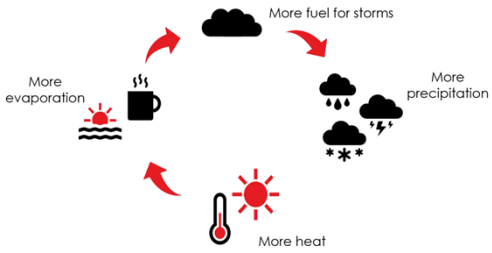
How Does Climate Change Work?

The heat-trapping blanket metaphor

- The atmosphere is like a blanket that surrounds the earth.
- Burning fossil fuels adds more carbon dioxide to the atmosphere and makes the blanket thicker.
- The blanket has become too thick. It's trapping in too much heat, and the planet is warming up too fast.

15

Rising Temperatures Cause More Precipitation Events



16

Massachusetts Observed Climate Changes

- Temperature: 2.9°F Since 1895 (Statewide)
- Growing Season: 15 Days Since 1950
- Sea Level Rise: 11 inches Since 1922 (Boston)
- Heavy Precipitation: 55% Since 1958

Source: Climate Science Special Report, 2017; NOAA NCEI nClimDiv; NOAA Ocean Service

17

CONSEQUENCES

Changes in precipitation
- Inland flooding
- Drought

Rising Temperatures
- Wildfires
- Invasive species/pests

Extreme Weather
- Hurricanes/tornadoes
- Severe winter storms

Human-induced hazards
- Loss of habitat/floodplains
- Overuse of fertilizers/pesticides

18

Groveland Climate Projections

19

Resilience MA

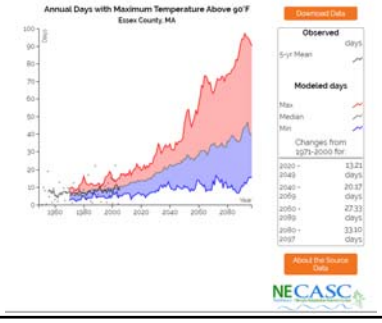
Climate Change Clearing House for the Commonwealth

(http://resilientma.org/)

20

Hotter… by 2040, days per year over 90 F will almost double

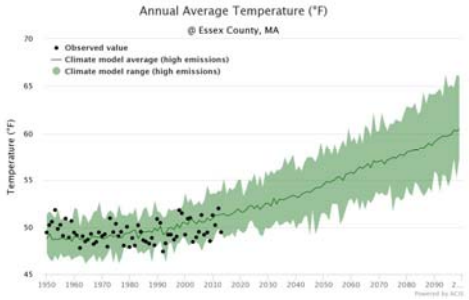
TEMPERATURE



21

Hotter… average annual temperature steadily increasing

TEMPERATURE

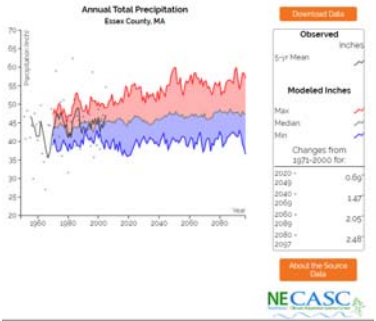


http://climatesmartfarming.org/tools/csf-county-climate-change/

22

Wetter… more frequent intense precipitation events

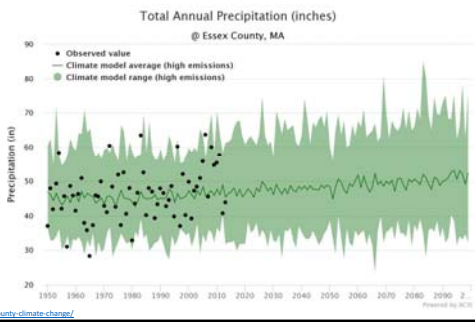
PRECIPITATION



23

Wetter… increasing average annual rainfall

PRECIPITATION

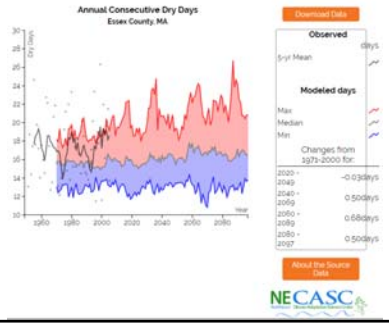


http://climatesmartfarming.org/tools/csf-county-climate-change/

24

More frequent droughts

DROUGHT



25

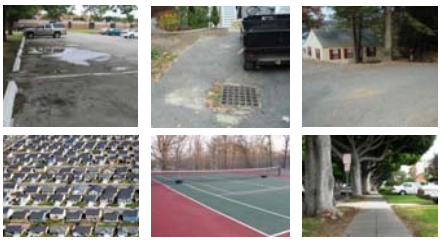
Potential Solutions:

Nature Based Green Infrastructure

26

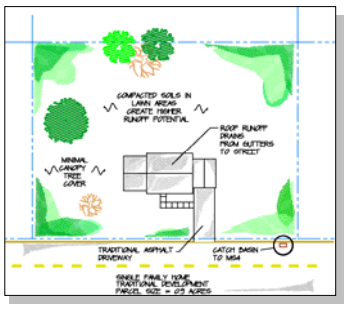
An ecosystem-based approach to land development and stormwater management

Mimic pre-development site hydrology!



27

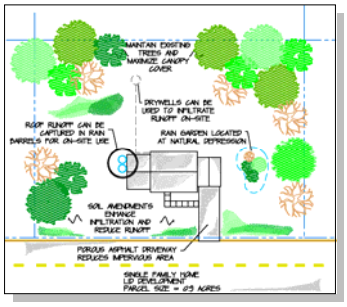
Conventional Single Family Lot



- Runoff: 8.9 in/yr
- Infiltration: 28.1 in/yr
- TSS: 213 lb/ac/yr
- TP: 0.72 lb/ac/yr

28

LID Single Family Lot



- Runoff: 1.9 in/yr
- Infiltration: 35.2 in/yr
- TSS: 68 lb/ac/yr
- TP: 0.27 lb/ac/yr

- Runoff: -7.0 in/yr
- Infiltration: +7.1 in/yr
- TSS: -145 lb/ac/yr (-68%)
- TP: -0.44 lb/ac/yr (-63%)

29

30

A bowl-shaped garden designed to capture and absorb stormwater.

31

32

33

Tree Box Filter (bioretention)

34

- Pollutant Uptake /Filtering
- Habitat / Wildlife Food Source
- Shading
- Aesthetics
- Physical deterrent to geese

35

Infiltrating Planter Box for Roof Runoff (Plymouth, MA)

36

Rain Barrels

- For capture/re-use of roof runoff
- Most barrels average 60 gallons and cost $75 - $125
- Cisterns are much larger systems, often involving pumps and drywell structures.

37

Porous Pavements (Wilmington MA)

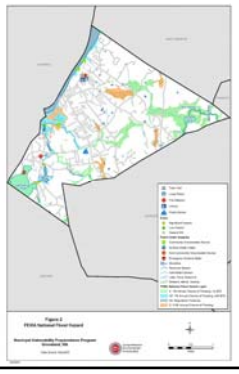
- Interlocking Concrete Pavers
- Porous Asphalt / Concrete
- Flexipave

38

Workshop Map Resources

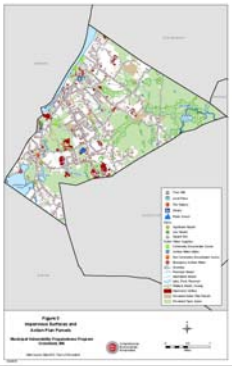
39

FEMA Flood Hazard Layer



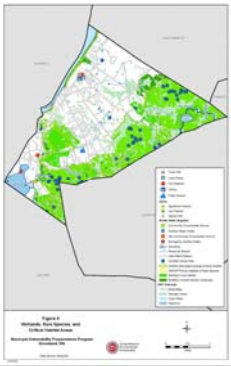
40

Zoning and Impervious Areas



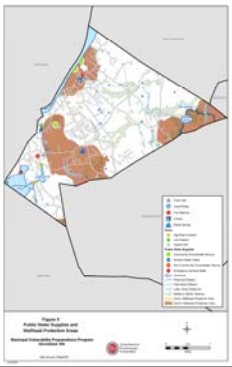
41

Critical Habitat Areas



42

Public Water Supply Protection Areas



43

Stakeholder Interview Results

44

Stakeholder Interview Results

VULNERABILITIES

Infrastructure
- Drainage System
- Critical facilities
- Emergency planning and communication

Environmental and Natural Assets
- Loss of floodplains
- Development in hazard areas and natural asset areas
- Agriculture

Public Utilities
- Public Water supply – wells and the Merrimack River
- Power outages
- Emergency services – funding and availability

Primary concern: Severe storms and flooding

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Stakeholder Interview Results

STRENGTHS

Governance
- Maintaining order and providing public services
- MVPC as a resource

Departmental Planning
- Each department within the Town has a developed emergency plan
- Town Emergency Planning Documents – good guidance, could be expanded

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Group Exercises

- B: Characterize Hazards
- C: Identify Community Vulnerabilities and Strengths
- D: Identify and Prioritize Community Actions
- E: Determine the Overall Priority Actions

Table Facilitators:
- Bob Hartzel, CEI
- Elisha Musgraves, CEI
- David Roman, CEI *(Floating)*

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Ground Rules

- Contribute
- Let everyone participate
- Listen with an open mind
- Stay on point and on time
- Attack the problem, not the person!

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Ground Rules

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Group Exercise #1

B: Characterize Hazards

Objective: Develop **Top 3 Hazards** for facilitated discussions on vulnerabilities and strengths of Groveland (infrastructure, natural resources, people, supply chain, etc.)

1. Table introductions, identify team spokesperson, review Risk Matrix and maps
2. Identify Top 3 Hazards
   i. *10-15 mins*
3. Report out to large group
   i. *10-15 mins*

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Example Hazards:

- **Intense freezes – ice storms**
- **Wind events – high gusts, tornadoes**
- **Drought – wildfire, high temperatures**
- **Intense precipitation events**
- **Flooding**
- **Nor'easters**

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Group Exercise #2

C: Identify Community Vulnerabilities and Strengths

Objective: Develop a **profile** of Groveland's infrastructural, societal, and environmental **components that are impacted by the Top 3 Hazards**

1. Begin in first column of the matrix and identify vulnerabilities (V) and strengths (S).
2. Determine location of V/S and list it on the Risk Matrix and mark it on the Base Map
3. Identify ownership of issue/asset/location
4. Time: Appx. 60-90 Minutes

52

Example Vulnerabilities:

- Main road floods, blocking emergency response
- Power outage during heat waves lead to health concerns
- Wildfire and high winds cause supply chain interruptions
- Sewer pump stations become inoperable
- Compromised rail system due to heat-related track warping

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Example Strengths:

- Main road elevated and passable by emergency vehicles
- Hurricane roof installed at school – improved sheltering capacity
- Hardened utility lines reduce ice storm outages
- Undersized culver replaced – reduces flooding at key intersection
- Improvement to communications system during extreme weather

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Lunch!

55

Group Exercise #3

D: Identify and Prioritize Community Actions

Objective: Identify and prioritize **actions** to help reduce vulnerability or reinforce strengths for each of the Top 3 Hazards

1. Begin on right side of the Matrix – "Actions"
2. Under the "Hazards" column, identify the actions needed to reduce V or reinforce S represented by each feature/asset
3. After completing "Hazards" column, consider the Priority (High, Medium, Low) and Urgency (Ongoing, Short-term, Long-term) of each potential action
4. Identify 3-4 Priority Actions per team

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Example Actions:

- Improved access to high-risk locations
- Reduce housing stock in vulnerable areas
- Prioritize development in low-risk areas
- Integrate future risks in capital improvement plans
- Flood-proof manhole covers
- Secure new generators for critical facilities

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Group Exercise #3

E: Determine the Overall Priority Actions

Objective: Present the findings of each group and collectively discuss identified opportunities to reduce current and future hazard risks and improve resilience

1. Spokesperson from each small team presents findings to Large Group
2. Spokesperson presents the 3-4 priority action cards to Lead Facilitator
3. Large Group Discussion to further define Highest Priority action list:
   i. Top 3-5 actions to implement for Town of Groveland

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Prioritization Factors

Consider factors such as:

- Funding availability / terms
- Agreement on outstanding impacts from recent hazard
- Necessity for advancing long-term outcomes
- Contribution to meeting existing local/regional planning objectives

Examples of urgency:

- Current project to install hurricane-proof roof on school is ongoing **(O)** action.
- Ensuring evacuation procedures are updated annually is considered a short-term **(S)** action.
- Reducing housing stock in high-risk areas, elevating a road, or replacing a bridge are long-term **(L)** actions.

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Wrap-Up

NEXT STEPS:

- **Develop Report**
- **Hold Listening Session**
- **Become MVP Community**

Apply for Action Grant Funding!

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Thank you for your time!

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APPENDIX B

COMPLETED RISK MATRICES

Community Resilience Building Risk Matrix

GREEN TEAM

www.CommunityResilienceBuilding.org

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Flooding	Severe Storms	Extreme Temperatures		Priority H - M - L	Time S Long O
Infrastructural									
Stormwater Management	Multiple	Town	V	Town wide study/design/retrofit; study on abandoned BMPs and associated stormwater				H	L
Hydraulic Infrastructure	Multiple	Town	V/S	Johnson Creek floodplain: study/design/retrofit				H	L
Sewer Systems	Multiple	Town	V/S	Failing septic identification; implementation study on expansion o f sewer system to south of 97				M	L
Main St and Washington St - Connection to Haverhill		Town + Private	V	Green infrastructure/LID	Green infrastructure/LID			M	S
Public Drinking Supply	Multiple	Town	V	Study currently underway: implement recommendations				L	O
Emergency Access			S	Revisit current laws/regs to enhance/make stronger				L	O/S
Societal									
Nichols Village (62+ community, 200 units)	Nichols Way	Private	V/S	Culvert analyses; coordinate emergency planning efforts with Town				L	L
Whitestone Village (55+ community)	Alyssa Drive	Private	V/S	Monitor existing stormwater controls; coordinate emergency planning efforts with Town				L	L
River Pines: Housing Authority	River Pines Drive	Town/state	V/S	Potential emergency shelter; coordinate emergency planning efforts with Town				L	L
Bagnall School	School Street	Town	S	Potential expansion/collaboration with West Newbury region to expand shelter (no showers)					L
40b Planned Development	Salem St	Private	V/S	Maintain existing floodplains/LID; ensure coordination of emergency planning efforts with Town				M	S
HMP			V/S	Apply for a planning grant for a Town specific HMP				M	O
Environmental									
Brush Fires	Multiple		V			Coordinate with state to ensure proper maintenance; public education on yard waste		L	L
Beaver Dams	Multiple		V	Environmental consultant for assessing impacts				L	L
Remediated Groveland Wells Superfund Site	Washington St		V/S	Feasibility study for land reuse				M	O
Protected Open Space	Multiple	Town/State	V/S	Continue to promote/protect town-owned open space (bylaws, regs, etc.); encourgae recreation and use				L	O
Johnson's Pond - invasive pests			V	Continue to apply remediation plan for pond; encourage recreation				L	O
Snow Storage	Multiple		V		Revamp planned storgae areas/assess de-icers			M	O
J.B. Little Road		Town	V	Assess for reopening: recreation access, intertown connectivity --> stormwater/floodplains, repaving				L	L

Community Resilience Building Risk Matrix

BLUE TEAM

www.CommunityResilienceBuilding.org

H-**M**-**L** priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Flooding	Severe Storms	Extreme Temperatures		Priority H - M - L	Time S Short L Long O Ongoing
Infrastructural									
Johnson Creek Floodplain Management	Johnson Creek	Town + Private	V	Flow controls; suport plan and retrofits	Flow controls; suport plan and retrofits			H	S/L
Stormwater Outfalls on Merrimack River (erosion)	Bank of river	Town	V		Stabilize banks/outfalls; engineered feasibility redesign study			H	L
Municipal Power Utility	944 Salem St	Town	S/V	Substation within 500 yr floodplain: raise controls appr. 2 ft; increase lightening protection and substation capacity				L	O
Aging/Undersized Infrastructure	Multiple, Washington St, Salem, St	Town	V	center street culvert retrofit/ town wide assessment of stormwater infrastructure				H/M	S/L
Salem Street Dam (High Hazard)	Salem St	Town	V	Retrofit dam outlet control				H	S
DPW Yard Location in 500 yr floodplain	Center St	Town	V	Develop alternate egress; link to Johnson Creek management				M	L
Societal									
Water Supply Wells	Merrmiack Floodplain	Town	V	Relocate; new wells: standpipes				L	L
South Groveland: Potential flood isolation	South of 47	Town/private	V	Create signage/mailings to diseminate information; update emergency plans				M	O
Emergency Shelters	Town Hall/Fire Station/Bagnall School	Town	V	New shelter (regional school); upgrade Bagnall School generators; develop written protocol for varying size emergencies				M	S
Equipment/Community Assistance (contractors)	Multiple	Private	S	Increase communication and coordination for all departments involved in Emergency Management				M	O
Local Control of Response Actions			S						
Senior Housing: High Ground	Whitestone village, Nic	Private	S	Continue to protect and support flooding controls					
Environmental									
Protected Land (Crane Pond, wetlands, floodplains, etc.)	Multiple	Town/state	S	Continue to acquire and manage key parcels				L	O
Blandings/Wood Turtle Habitat	Multiple		V					M	S
Forest Management: spread of invasive pests (asian longhorn beetle, etc)			V	Coordinate with DCR and local forestry management mechanisms on plans to protect/remediate; management plan for town-owned forest				M	S
Insect risks (mosquitos, ticks)			V	Better signage at town properties; better educational info distribution (i.e. with taxes, targeting specific populations)				M	S

APPENDIX C

BASE MAPS AND WORKSHOP MAP RESOURCES

Green Team

Figure 1
Town Base Map

Municipal Vulnerability Preparedness Program
Groveland, MA

Comprehensive Environmental Incorporated

10/2/2019

Blue Team

Figure 1
Town Base Map

Municipal Vulnerability Preparedness Program
Groveland, MA

TOWN OF GROVELAND
MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

Climate Change and Natural Hazard Vulnerability Assessment

WORKSHOP MAP PACKAGE – DECEMBER 2019

List of Maps:

- Town Base Map 24x36
- Town Base Map 11x17
- FEMA National Flood Hazard
- Impervious Surfaces and Action Plan Parcels
- Wetlands and Critical Habitats
- Public Water Supplies and Wellhead Protection Areas

Map Layer:	Source:
Groveland Open Space	Town of Groveland
Groveland Action Plan Parcels	Town of Groveland
Town Hall	MassGIS
Fire Stations	MassGIS
Police Stations	MassGIS
Library	MassGIS
Schools	MassGIS
Dams	MassGIS
Public Water Supplies	MassGIS
Certified Vernal Pools	MassGIS
FEMA National Flood Hazard	MassGIS
DEP Wetlands	MassGIS
NHESP Estimated Habitats of Rare Wildlife	MassGIS
NHESP Priority Habitats of Rare Species	MassGIS
BioMap2 Core Habitat	MassGIS
BioMap2 Critical Natural Landscape	MassGIS
Zone I Wellhead Protection Areas	MassGIS
Zone II Wellhead Protection Areas	MassGIS
Interim Wellhead Protection Areas	MassGIS
Impervious Surfaces	MassGIS
Hydrography	MassGIS
Roads	MassGIS

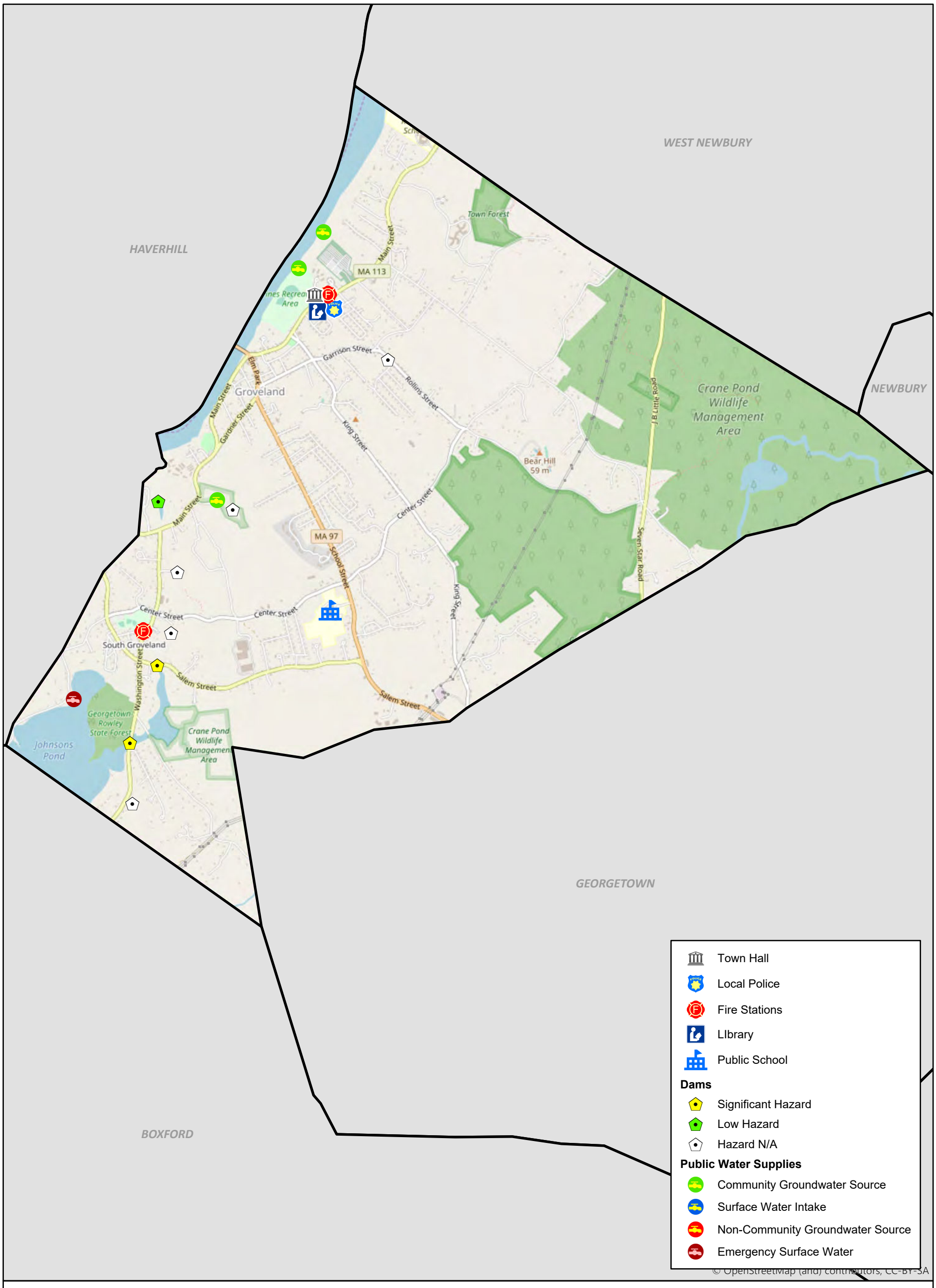

Figure 1
Town Base Map

Municipal Vulnerability Preparedness Program
Groveland, MA

Data Source: MassGIS

Comprehensive Environmental Incorporated

N

0 0.5 1
Miles

10/2/2019

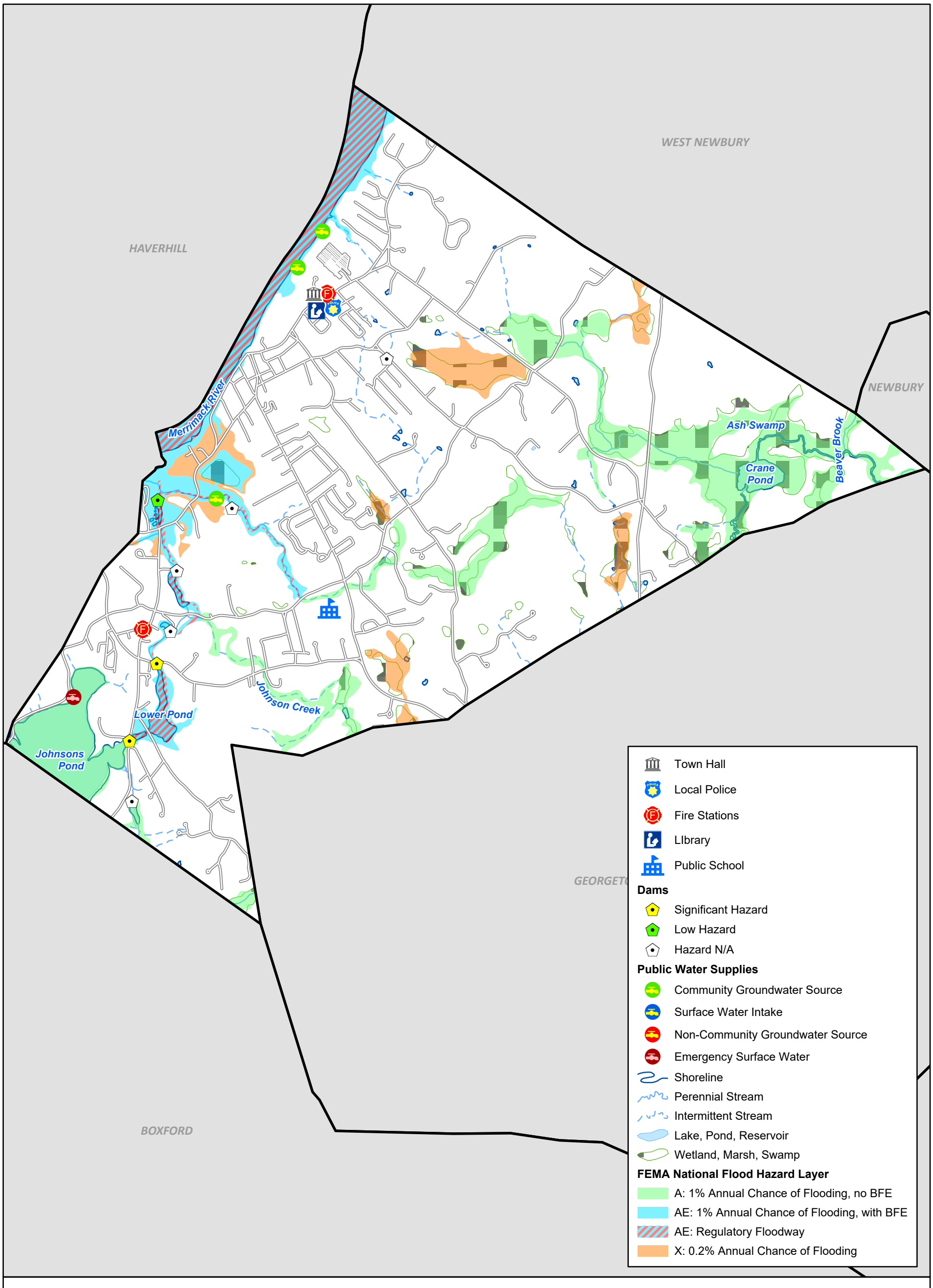

Figure 2
FEMA National Flood Hazard

Municipal Vulnerability Preparedness Program
Groveland, MA

Data Source: MassGIS

Comprehensive Environmental Incorporated

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Miles

10/2/2019

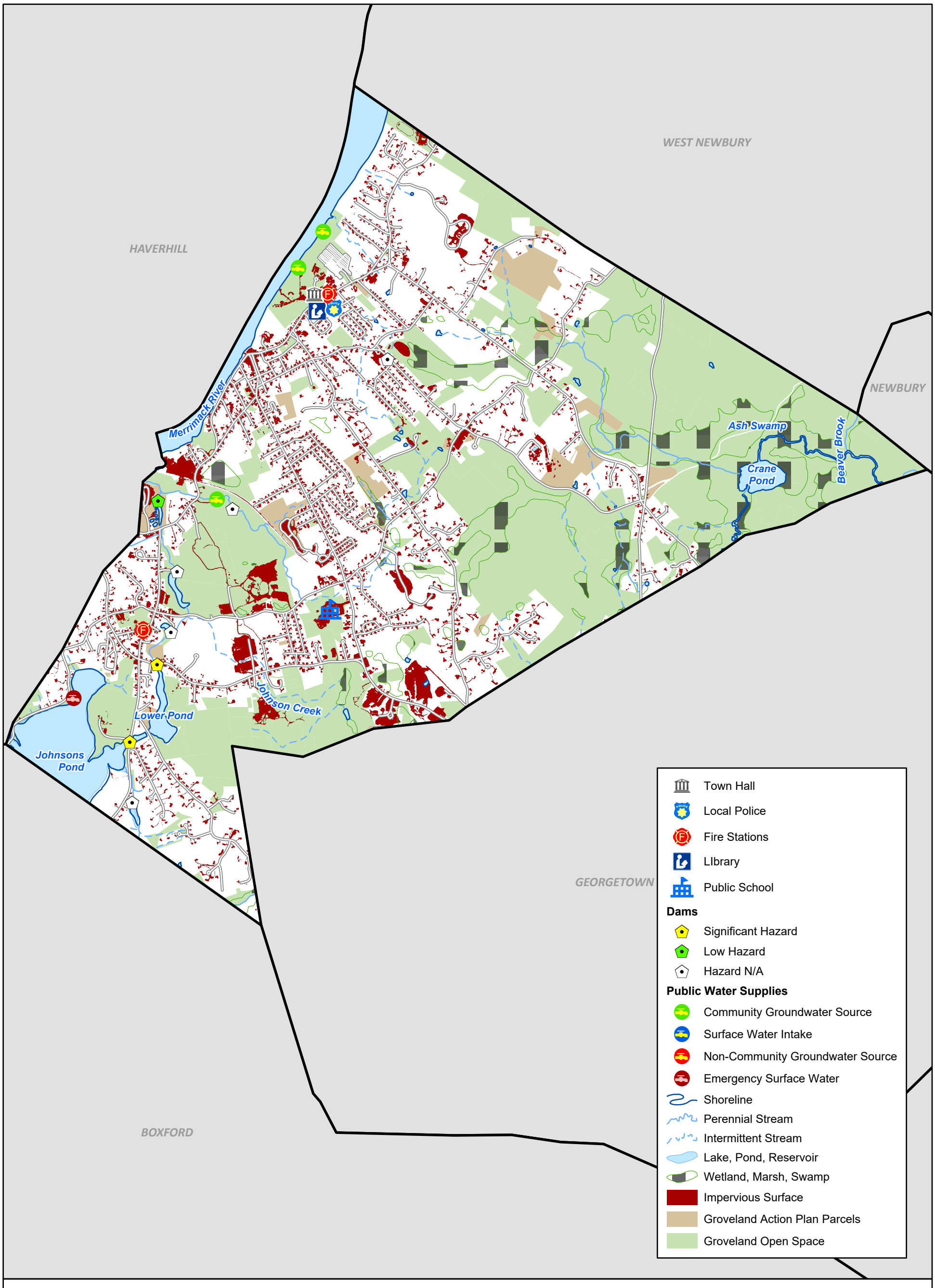

Figure 3
Impervious Surfaces and Action Plan Parcels

Municipal Vulnerability Preparedness Program
Groveland, MA

Data Source: MassGIS, Town of Groveland

Comprehensive Environmental Incorporated

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Miles

10/2/2019

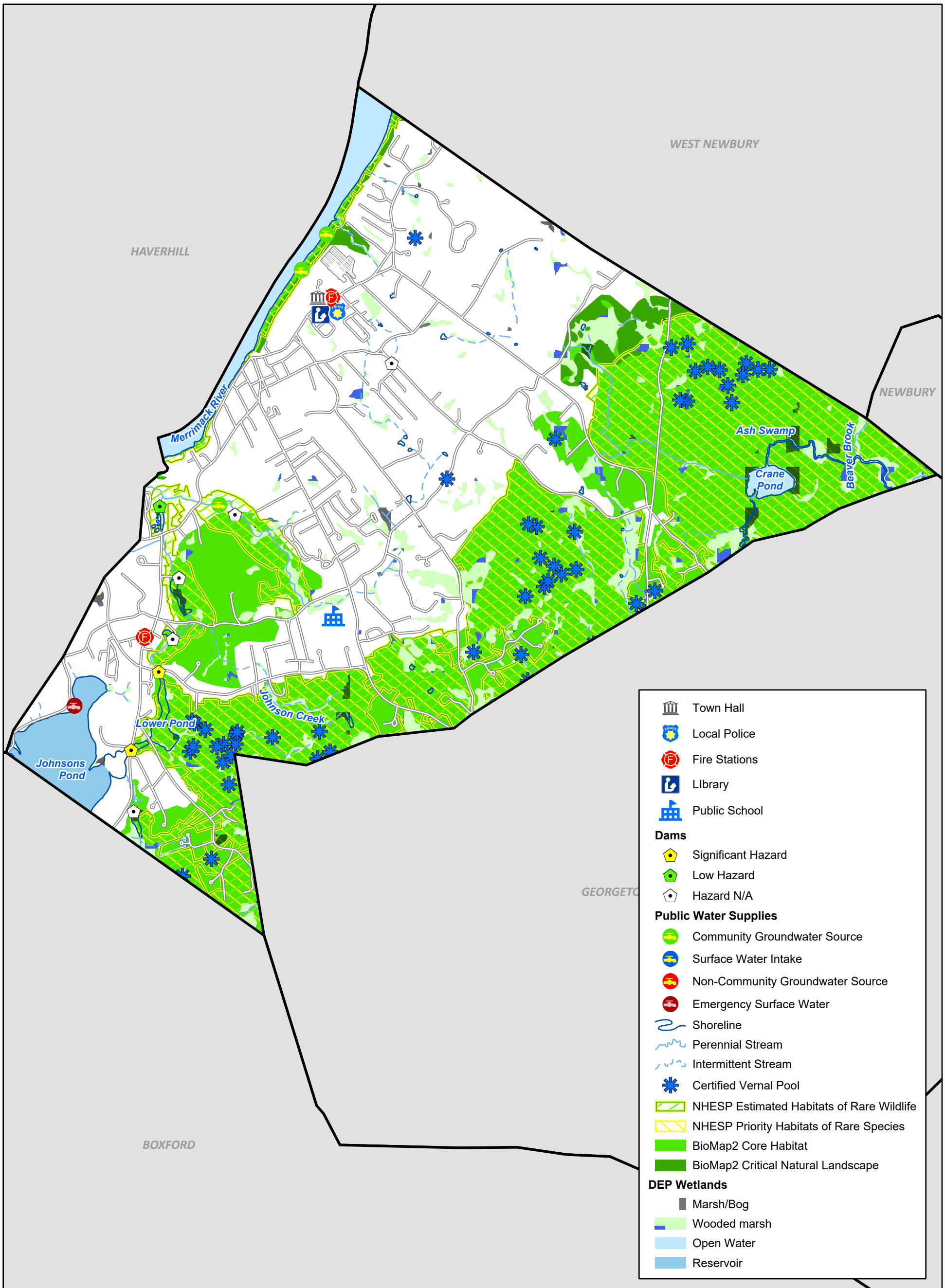

Figure 4
Wetlands, Rare Species, and Critical Habitat Areas

Municipal Vulnerability Preparedness Program
Groveland, MA

Comprehensive Environmental Incorporated

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Miles

Data Source: MassGIS

10/2/2019

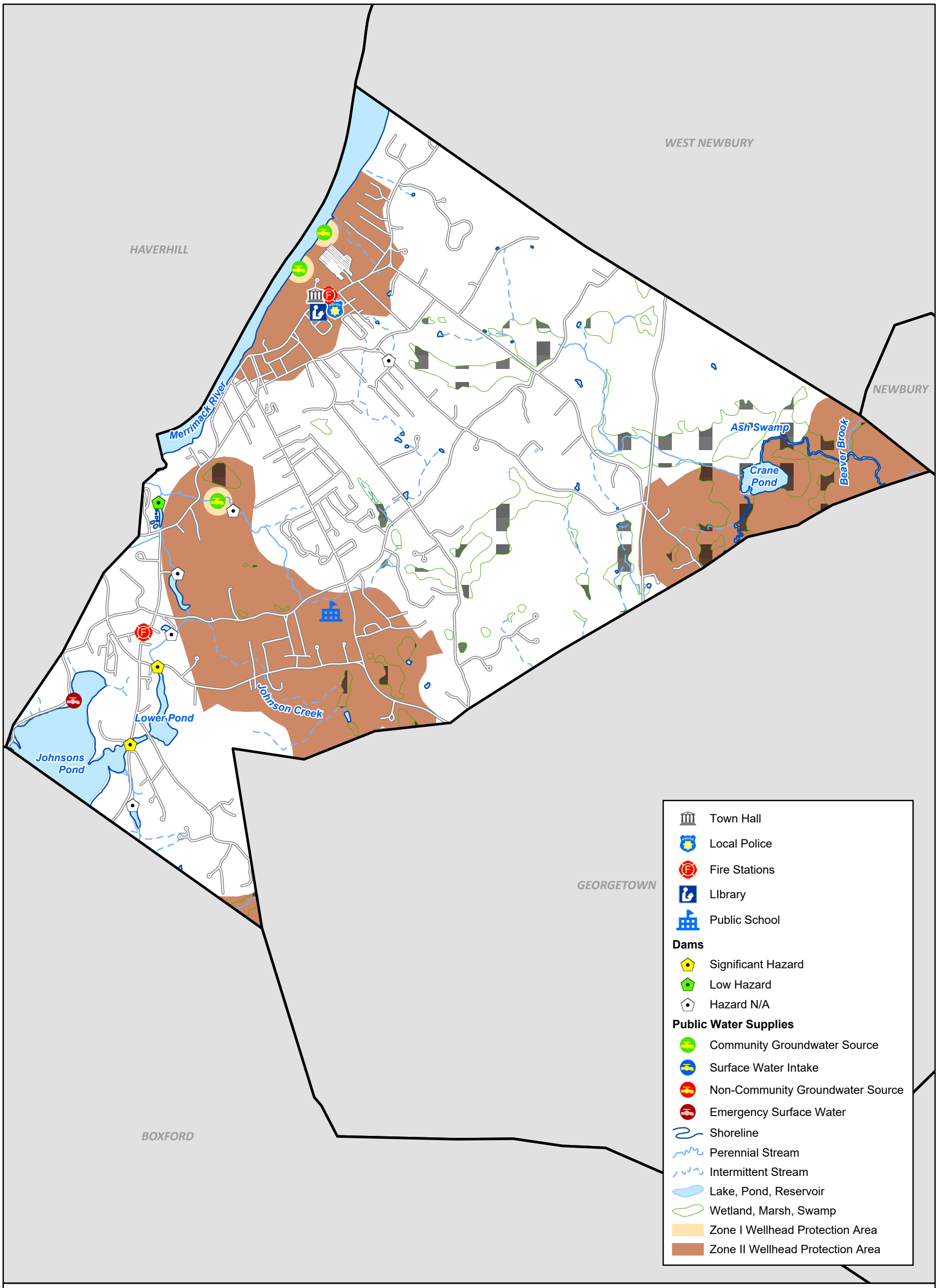

Figure 5
Public Water Supplies and Wellhead Protection Areas

Municipal Vulnerability Preparedness Program
Groveland, MA

Data Source: MassGIS

Comprehensive Environmental Incorporated

N

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Miles

10/2/2019

APPENDIX D

PROPOSED REVISIONS TO STORMWATER MANAGEMENT AND LAND DISTURBANCE BYLAW

14.1 TOWN OF GROVELAND

GENERAL BYLAW

14.2 ARTICLE 14 STORMWATER MANAGEMENT AND LAND DISTURBANCE BYLAW

~~*14.1*~~*14.3 ~~PURPOSE~~INTRODUCTION*

~~14.1.1~~ Eroded soil and storm-water runoff entering water resources are considered non-point sources of pollution that are responsible for the degradation of water quality and hydrology in lakes, ponds, streams, rivers, wetlands and groundwater. The United States Environmental Protection Agency (EPA) estimates that polluted storm-water runoff is the leading cause of impairment to the nearly 40% of impaired waterbodies in the United States. (Source: 1998 EPA 303(d) list of impairment by category)

14.3.1

14.3.2 The impacts of construction activities and post development stormwater runoff quantity and quality can adversely affect public health, land, surface and groundwater resources, drinking water supplies, recreation, and aquatic life and habitat.

14.4 PURPOSE

14.4.1 The purpose of this section is to reduce the degradation of public health, land, and the environment due to construction activities and land development from soil erosion and sedimentation from construction projects and post-construction stormwater runoff.

14.4.2 This bylaw seeks to meet this purpose through the following objectives:

~~1.1 The purpose of this section is to reduce the degradation of public health, land, and the environment due to construction activities and~~

DRAFT

~~land development from:~~

14.4.2.1 Establish the Town of Groveland as the legal authority to ensure compliance with this Bylaw.

14.4.2.2 Establish administrative procedures for: the submission, review, and approval or disapproval of Stormwater Management and Land Disturbance Permit;

14.4.2.3 Establish the inspection of approved active projects and post construction follow up;

14.4.2.4 Establish procedures for submittal of as-built plans and to ensure adequate long-term operation and maintenance; and

14.4.2.5 Ensure compliance with requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) and other applicable State and Federal mandates.

~~1. Soil erosion and sedimentation~~

~~2. Storm water runoff~~

DRAFT

~~The section regulates the design, construction, and maintenance of any development or other activity which disturbs soil or results in an increased rate of stormwater runoff on land in the Town of Groveland.~~

~~14.2~~14.5 AUTHORITY

~~14.2.1~~14.5.1 This bylaw is adopted under authority granted by the Home Rule Amendment of the Massachusetts Constitution, the Home Rule statutes, and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122.34

~~14.3~~14.6 DEFINITIONS

14.6.1 As used in this bylaw, the following terms shall have the meanings indicated below:

ABUTTER: Property owner of any property having a common boundary line with the Applicant's property, or any owner of any property located adjacent to the Applicant's property on a public way or stream, or any property owner located within a distance of three hundred feet (300') of the property.

AGRICULTURE: The normal maintenance or improvement of land in agricultural or aquacultural use, as defined by the Massachusetts Wetlands Protection Act and its implementing regulations.

ALTERATION OF DRAINAGE CHARACTERISTICS: Any activity on an area of land that changes the water quality, force, direction, timing or location of runoff flowing from the area.

Such changes include: change from distributed runoff to confined, discrete discharge; change in the volume of runoff from the area; change in the peak rate of runoff from the area; and change in the recharge to groundwater on the area.

APPLICANT: Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision, of the Commonwealth or the Federal government to the extent permitted by law requesting a soil erosion and sediment control permit for proposed land-disturbance activity.

AUTHORIZED ENFORCEMENT AGENCY: The Town of Groveland Planning Board, hereafter the Board, its employees or agents designated to enforce this by-law.

BEST MANAGEMENT PRACTICE (BMP): An activity, procedure, restraint, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

THE BOARD: Town of Groveland Planning Board.

~~14.3~~ CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC):

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A certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

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CONSTRUCTION AND WASTE MATERIALS: Excess or discarded building or site materials, including but not limited to demolition debris, discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at a construction site that may adversely impact water quality.

CONVEYANCE: Any structure or device, including pipes, drains, culverts, curb breaks, paved swales, or man-made swales of all types designed or utilized to move or direct stormwater runoff or existing water flow.

CLEARING: Any activity that removes the vegetative surface cover.

DEVELOPMENT: The modification of land to accommodate a new use or expansion of use, usually involving construction.

DISCHARGE OF POLLUTANTS: The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or Commonwealth from any source.

DISTURBANCE OF LAND: Any action that causes a change in the position, location, or arrangement of soil, sand, rock, gravel or similar earth material.

EROSION: The wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity, or vehicle traffic and the subsequent detachment and transportation of soil particles.

EROSION AND SEDIMENTATION CONTROL PLAN: A document containing narrative, drawings and details developed by a qualified professional engineer (PE) and a Certified Professional in Erosion and Sedimentation Control (CPESC), which includes best management practices, or equivalent measures designed to control surface runoff, erosion and sedimentation during pre-construction and construction related land disturbance activities.

~~*14.4*~~ **ESTIMATED HABITAT OF RARE WILDLIFE AND CERTIFIED VERNAL POOLS:**

Habitats delineated for state-protected rare wildlife and certified vernal pools for use with the Wetlands Protection Act Regulations (310 CMR 10.00) and the Forests and Parks Rules Regulations (304 CMR 12.00).

~~the Forest Cutting Practices Act Regulations (304 CMR 11.00).~~

GRADING: Changing the level or shape of the ground surface.

GROUNDWATER: All water beneath any land surface including water in the soil and bedrock beneath water bodies.

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GRUBBING: The act of clearing land by digging up roots and stumps.

IMPERVIOUS SURFACE: Any material or structure on or above the ground that prevents water infiltrating the underlying soil. Impervious surface includes without limitation roads, paved parking lots, sidewalks, and roof tops.

INFILTRATION: The act of conveying surface water into the ground to permit groundwater recharge and the reduction of stormwater runoff from a project site.

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LAND-DISTURBING ACTIVITY: Any activity that causes a change in the position or location of soil, sand, rock, gravel, or similar earth material.

MASSACHUSETTS ENDANGERED SPECIES ACT: (G.L. c. 131A) and its implementing regulations at (321 CMR 10.00) which prohibit the "taking" of any rare plant or animal species listed as Endangered, Threatened, or of Special Concern.

MASSACHUSETTS STORMWATER MANAGEMENT POLICY: The Policy issued by the Department of Environmental Protection, and as amended, that coordinates the requirements prescribed by state regulations promulgated under the authority of the Massachusetts Wetlands Protection Act G.L. c. 131 §. 40 and Massachusetts Clean Waters Act G.L. c. 21, §. ~~23~~26-56. The Policy addresses stormwater impacts through implementation of performance standards to reduce or prevent pollutants from reaching water bodies and control the quantity of runoff from a site.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) or municipal storm drain system: The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Groveland.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT: A permit issued by the United States Environmental Protection Agency (EPA) or jointly with the State that authorizes the discharge of pollutants to waters of the United States.

NEW DEVELOPMENT: Any construction or land disturbance of a parcel of land that is currently in a natural vegetated state and does not contain alteration by man-made activities.

NON-POINT SOURCE POLLUTION: Pollution from many diffuse sources caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into water resource areas.

OPERATION AND MAINTENANCE PLAN: A plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to insure that it continues to function as designed.

OUTFALL: The point at which stormwater flows out from a point source discernible, ~~confined and discrete conveyance~~as defined herein, into waters of the Commonwealth.

OUTSTANDING RESOURCE WATERS (ORWs): Waters designated by Massachusetts Department of Environmental Protection as ORWs. These waters have exceptional sociologic, recreational, ecological and/or aesthetic values and are subject to more stringent requirements

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under both the Massachusetts Water Quality Standards (314 CMR 4.00) and the Massachusetts Stormwater Management Standards. ORWs include vernal pools certified by the Natural Heritage Program of the Massachusetts Department of Fisheries and Wildlife and Environmental Law Enforcement, all Class A designated public water supplies with their bordering vegetated wetlands, and other waters specifically designated.

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OWNER: A person with a legal or equitable interest in property.

PERSON: An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

PHASING: Clearing a parcel of land in distinct sections, with the stabilization of each section before the clearing of the next.

POINT SOURCE: Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, or container from which pollutants are or may be discharged.

POLLUTANT: Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or non-point source, that is or may be introduced into any sewage treatment works or waters of the Commonwealth. Pollutants shall include, but are not limited to:

- Chemicals, paints, varnishes, and solvents;
- Oil and other automotive fluids;
- Non-hazardous liquid and solid wastes and yard wastes;
- Refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;
- Pesticides, herbicides, and fertilizers;
- Hazardous materials and wastes, sewage, fecal coliform and pathogens;
- Dissolved and particulate metals;
- Animal wastes;
- Rock, sand, salt, soils;
- Concrete truck washout;
- Sanitary wastes;
- Construction wastes, demolition debris, and discarded building materials; and,
- Noxious or offensive matter of any kind.

POST-DEVELOPMENT: The conditions that reasonably may be expected or anticipated to exist after completion of the land development activity on a specific site or tract of land.

PRE-DEVELOPMENT: The conditions that exist at the time that plans for the land development of a tract of land are submitted to the Conservation Commission or Planning Board.

PRE-CONSTRUCTION: All activity in preparation for construction.

PRIORITY HABITAT OF RARE SPECIES: Habitats delineated for rare plant and animal populations protected pursuant to the Massachusetts Endangered Species Act and its regulations.

RECHARGE: The replenishment of underground water reserves.

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REDEVELOPMENT: Development, rehabilitation, expansion, demolition or phased projects that disturb the ground surface or increase the impervious area on previously developed sites.

RESOURCE AREA: Any area protected under including, without limitation: the Massachusetts Wetlands Protection Act, Massachusetts Rivers Act, or Town of Groveland Wetland Protection Bylaw and Regulations.

RUNOFF: Rainfall, snowmelt, or irrigation water flowing over the ground surface.

SEDIMENT: Mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.

SEDIMENTATION: The process or act of deposition of sediment.

SITE: Any lot or parcel of land or area of property where land-disturbing activities are, were, or will be performed.

SLOPE: The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.

SOIL: Any earth, sand, rock, gravel, or similar material.

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STORMWATER AUTHORITY: Town of Groveland Planning Board or its authorized agents are responsible for coordinating the review, approval and permit process as defined by this Bylaw.

STABILIZATION: The use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or retard erosion.

STORMWATER: Storm-water runoff, snow melt runoff, and surface water runoff and drainage.

STORMWATER MANAGEMENT PLAN: A plan required as part of the application for a Stormwater Management and Land Disturbance ~~Bylaw~~ Permit.

STRIP: Any activity which removes the vegetative ground surface cover, including tree removal, clearing, grubbing, and storage or removal of topsoil.

TSS: Total Suspended Solids.

VERNAL POOLS: Temporary bodies of freshwater which provide critical habitat for a number of vertebrate and invertebrate wildlife species.

WATERCOURSE: A natural or man-man channel through which water flows or a stream of water, including a river, brook, or underground stream.

WETLAND RESOURCE AREA: Areas specified in the Massachusetts Wetlands Protection Act G.L. c. 131, § 40 and Groveland Wetland Protection Bylaw and Regulations.

WETLANDS: Tidal and non-tidal areas characterized by saturated or nearly saturated soils most of the year that are located between terrestrial (land-based) and aquatic (water-based) environments, as defined in the Massachusetts Wetlands Protection Act G.L. c. 131, § 40, including freshwater marshes around ponds and channels (rivers and streams), brackish and salt marshes; common names include marshes, swamps and bogs.

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~~14.4.1~~***~~14.7~~ ~~14. 4.~~ APPLICABILITY***

~~14.4.1~~14.7.1 No person may undertake a construction activity, including clearing, grading and excavation that results in a land disturbance that will disturb equal to or greater than 20,000 square feet of land or will disturb less than 20,000 square feet of land but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than 20,000 square feet of land draining to the Town of Groveland without a Stormwater Management and Land Disturbance Permit from the Board.

14.7.2 In addition, as authorized in the Phase II Small MS4 General Permit for Massachusetts, storm-water discharges resulting from the above activities that are subject to jurisdiction under the Wetlands Protection Act and demonstrate compliance with the Massachusetts Stormw~~W~~ater Management Policy as reflected in an Order of Conditions issued by the Conservation Commission and contain an approved Stormwater Pollution Prevention Plan may be exempt from compliance with the review process of this bylaw, as determined by the Planning Board or an authorized agent, upon the submittal of the following:

~~14.4.2~~

14.7.2.1 ~~14.4.2.1 Two copies of~~ A~~a~~ formal written request for an exemption in accordance with ~~s~~Section 14.~~4.2~~8 ~~completed Application Form along with~~ , a copy ~~copies~~ of the Conservation Commission~~'s~~ Order of Conditions and approved plan, and a copy of the Stormwater Pollution Prevention Plan. ~~The Planning Board shall issue a Stormwater Management and Land Disturbance Permit at its next regularly scheduled meeting after receipt of said materials. The filing fee shall be waived.~~

~~14.4.2~~***~~14.8~~ ~~14. 5.~~ EXEMPTIONS***

14.8.1 The following may be exempt from the requirements of this bylaw:

~~14.5.1~~14.8.1.1 Normal maintenance and improvement of land in agricultural, aquacultural, forestry, or nursery operations as permitted as a main or accessory use.

~~14.5.2~~14.8.1.2 Any emergency activity which is immediately necessary for the protection of public health, property or natural resources.

~~14.5.3~~14.8.1.3 Emergency repairs to any stormwater structure

~~14.5.4~~14.8.1.4 Maintenance of existing landscaping, gardens or lawn areas.

~~14.5.5~~ Construction of patios, walkways, driveways, fences, swimming pools and the replacement of wells or septic systems on lots having

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an existing dwelling.

14.8.1.5

~~14.5.6~~ Construction or emergency repair to any utilities other than drainage, which would not alter the terrain, ground cover or drainage patterns.

14.8.1.6

14.8.1.7 Emergency repairs to any stormwater management system or feature that poses a threat to public health or safety, or as deemed necessary by a Town department or board.

14.8.1.8 Normal maintenance and improvements of the Town of Groveland publicly owned roadways and associated drainage infrastructure; and

Projects that are wholly subject to jurisdiction under the Wetlands Protection Act and demonstrate compliance with the Massachusetts Stormwater Management Policy as reflected in an Order of Conditions issued by the Conservation Commission

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14.8.1.9

~~14.4.3~~***~~14.9~~ ~~14. 6.~~ ADMINISTRATION***

~~14.6.1~~14.9.1 The Board shall be the Permit Granting Authority (PGA), unless otherwise specified in Section 14.9.4 below, and shall administer, implement and enforce this bylaw. Any powers granted to or duties imposed upon the Board may be delegated in writing by the Board to its agent.

~~14.6.2~~14.9.2 The Board may waive strict compliance with any requirement of this by-law or the rules and regulations promulgated hereunder, where:

~~1.~~14.9.2.1 ~~such~~ Such action is allowed by federal, state and local statutes and/or regulations;

~~2.~~14.9.2.2 ~~is~~ Is in the public interest;~~,~~ and

~~3.~~14.9.2.3 ~~is~~ Is not inconsistent with the purpose and intent of this by-law.

14.9.3 Rules and Regulations. The Board may adopt, and periodically amend rules and regulations to effectuate the purposes of this by-law. Failure by the Board to promulgate such rules and regulations shall not have the effect of suspending or invalidating this by-law.

14.9.4 The Building Inspector shall not issue a Building Permit without first confirming a Stormwater Management and Land Disturbance Permit has been obtained or is otherwise not required. The Stormwater Management and Land Disturbance Permit process shall be incorporated into existing permits to ensure efficiency of the Town permitting process for the Town and applicant. The following Town boards or commissions shall serve as the Permit Granting Authority as described below and their respective permits may serve as the Stormwater Management and Land Disturbance Permit upon finding the Project has demonstrated compliance with these rules and regulations:

14.9.4.1 Planning Board: Site Plan Approval, Subdivision Approval, Earth Removal Special Permit, or Special Permit Approval issued by the Groveland Planning Board shall serve as the Stormwater Management and Land Disturbance Permit, provided the project demonstrates compliance with these rules and regulations and the decision includes a designation as such;

14.9.4.2 Conservation Commission: An Order of Conditions issued by the Groveland Conservation Commission shall serve as the Stormwater Management and Land Disturbance Permit, provided the project demonstrates compliance with these rules and regulations and the order includes a condition as such; and/or

14.9.4.3 In cases where the above boards or commissions do not include a

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clear finding of compliance with these rules and regulations or when none of the above permits are required, the Board shall serve as the Stormwater Management PGA.

~~14.6.3~~

~~*14.7.*~~*14.10 PERMITS ~~and~~ AND PROCEDURE*

~~14.7.1~~14.10.1 If a project requires a Stormwater Management and Land Disturbance Permit, the applicant shall file ~~eight~~ two (2~~8~~) copies of a completed Stormwater Management and Land Disturbance Permit Application Package to the Planning Board. The applicant shall also file with the Planning Board one (1) electronic copy of the application package. Review of the complete application may be conducted concurrently with other applications to the Board. The application shall include the following:

~~14.7.1.1.~~14.10.1.1 Completed Application Form with original signatures;~~.~~

~~14.7.1.2~~14.10.1.2 A list of abutters, certified by the Assessors Office;~~.~~

~~14.7.1.3~~14.10.1.3 A~~n~~ Stormwater Management & Erosion and Sediment Control Plan as specified in Section 14.~~8~~ 12.3 of this bylaw;~~.~~

14.10.1.4 A Stormwater Operation & Maintenance Plan (O&M) as specified in Section 14.~~8~~ 12.4 of this bylaw;~~.~~

~~14.7.1.4~~14.10.1.5 Proof of compliance with the Stormwater Standards as specified in Section 14.13 of this bylaw;

~~14.7.1.5~~ Payment of the application and review fees as specified in Section 14.10.1.6 14.~~7~~11 of this bylaw; and~~.~~

~~14.7.2~~14.10.1.7 Filing an application for a permit grants the Board or its agent, permission to enter the site to verify the information in the application and to inspect for compliance with permit conditions.~~.~~

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~~14.7.3~~14.10.2 The Board shall transmit copies of the application to the Highway Superintendent, Water and Sewer Commission, Conservation Commission and the Board of Health. These boards and departments shall submit reports to the Planning Board within 35 days of referral. Failure of any such board or department to make recommendations within the 35 days of receipt by such board or department shall be deemed a lack of opposition to the application. ~~notify the Town Clerk of receipt of the application, and shall give one copy of the application package to the Highway Department, Water Department, the Conservation Commission and the Board of Health.~~

~~14.7.4~~14.10.3 Public Hearing.

~~14.7.4.1~~14.10.3.1 The Board shall hold a public hearing in conformance with the provisions of G.L. c.40A, Section 9;~~.~~

~~14.7.4.2~~14.10.3.2 The public hearing shall be held within 65 days after the filing of the application; and~~.~~

~~14.7.4.3~~14.10.3.3 Notice shall be given by publication and posting and by first class mailings to parties of interest as defined in G.L. c. 40A, Section 11.

~~14.7.5~~14.10.4 The applicant shall submit all additional information requested by the Board to issue a decision on the application.

~~14.7.6~~14.10.5 The Board may:

~~14.7.6.1~~14.10.5.1 Approve the Stormwater Management and Land Disturbance Permit Application and issue a permit if it finds that the proposed plan will protect water resources and meets the objectives and requirements of this by-law;~~.~~

~~14.7.6.2~~14.10.5.2 Approve the Stormwater Management and Land Disturbance Permit Application and issue a permit with conditions, modifications or restrictions that the Board determines are required to ensure that the project will protect water resources and meets the objectives and requirements of this by-law;~~.~~

14.10.5.3 Disapprove the Stormwater Management and Land Disturbance Permit Application and deny the permit if it finds that the proposed plan will not protect water resources or fails to meet the objectives and requirements of this by-law;

~~14.7.6.3 .~~

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14.10.5.4 The decision of the Board shall be filed with the Board and the Town Clerk within 90 days following the close of the public hearing;. Appeals.

~~14.7.6.4~~14.10.5.5 The applicant may appeal the decision, within thirty (30) consecutive calendar days, to the Groveland Board of Selectmen; and

~~14.7.6.5~~14.10.5.6 Failure of the Board to act within 90 days of the close of the public hearing shall be deemed a grant of the permit applied for.~~.~~

14.10.6 ~~Project Changes.~~ The permittee, or their agent, must notify the Board in writing of any change or alteration of a land-disturbing activity authorized in a Stormwater Management and Land Disturbance Permit before any change or alteration occurs. If the Board determines that the change or alteration is significant ~~, based on the design requirements listed in Section 14.8.2. and accepted construction practices~~, the Board may require that an amended Stormwater Management and Land Disturbance Permit application be filed and a public hearing held. If any change or alteration from the Stormwater Management and Land Disturbance Permit occurs during any land disturbing activities, the Board may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.

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14.11 Fees.EES

14.7.7 14.11.1 Each application must be accompanied by the appropriate application fee as established by the Board. Applicants shall pay review fees as discussed and determined by the Board sufficient to cover any expenses connected with the public hearing and review of the Stormwater Management and Land Disturbance Permit Application before the review process commences. The Board is authorized to retain a Registered Professional Engineer or other professional consultant to advise the Board on any or all aspects of the Application. The Board may require an additional fee for review of any change in or alteration from an approved permit.

14.11.2 The review fee collected under this bylaw shall be deposited in ~~a pass book account~~ an account established pursuant to M.G.L Chapter 44, Section 53G and held by the Town of Groveland.

14.11.3 Subject to applicable law, any unused portion of any review fees collected shall be returned by the Planning Board to the applicant within forty-five calendar days of a written request by the applicant, unless the Planning Board decides in a public meeting that other action is necessary.

14.7.7.1 14.11.4 A non-refundable application fee of $100 plus $.0030 times the total square footage of the area to be altered by the project shall be due and payable to the Town of Groveland at the time an application is filed.

~~14.7.8 14.1.1 Project Changes. The permittee, or their agent, must notify the Board in writing of any change or alteration of a land-disturbing activity authorized in a Stormwater Management and Land Disturbance Permit before any change or alteration occurs. If the Board determines that the change or alteration is significant, based on the design requirements listed in Section 14.8.2. and accepted construction practices, the Board may require that an amended Stormwater Management and Land Disturbance Permit application be filed and a public hearing held. If any change or alteration from the Stormwater Management and Land Disturbance Permit occurs during any land disturbing activities, the Board may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.~~

~~14.8.~~14.12 STORMWATER MANAGEMENT & EROSION AND SEDIMENT CONTROL PLAN

~~14.8.1~~ The Stormwater Management & Erosion and Sediment Control Plan shall contain sufficient information to describe the nature and purpose of the proposed development, pertinent conditions of the site and the adjacent areas, proposed

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erosion and sedimentation controls and proposed stormwater management

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14.12.1 controls. The applicant shall submit such material as is necessary to show that the proposed development will comply with the design requirements listed ~~in Section~~below.

~~14.8.2 below.~~

~~14.8.2~~14.12.2 The design requirements of the Stormwater Management & Erosion and Sediment Control Plan are:

~~14.8.2.1~~14.12.2.1 Minimize total area of disturbance;~~.~~

~~14.8.2.2~~14.12.2.2 Sequence activities to minimize simultaneous areas of disturbance;~~.~~

~~14.8.2.3~~14.12.2.3 Minimize peak rate of runoff in accordance with the Massachusetts Department of Environmental Protection's Stormwater Management Policy dated March 1997 as amended;~~.~~

~~14.8.2.4~~14.12.2.4 Minimize soil erosion and control sedimentation during construction, provided that prevention of erosion is preferred over sedimentation control;~~.~~

14.12.2.5 Evaluate opportunities for using low impact design (LID) and green infrastructure;

~~14.8.2.5~~14.12.2.6 Encourage the use of nonstructural stormwater management and low-impact development practices, such as reducing impervious;

14.12.2.7 ~~e~~Cover, preserving greenspace, using bio-retention areas, rain gardens, and vegetated filter strips;~~.~~

~~14.8.2.6~~14.12.2.8 Divert uncontaminated water around disturbed areas;~~.~~

~~14.8.2.7~~14.12.2.9 Maximize groundwater recharge;~~.~~

~~14.8.2.8~~14.12.2.10 Install and maintain all Erosion and Sediment Control measures in accordance with the manufacturers specifications and good engineering practices;~~.~~

~~14.8.2.9~~14.12.2.11 Prevent off-site transport of sediment;~~.~~

~~14.8.2.10~~14.12.2.12 Protect and manage on and off-site material storage areas (overburden and stockpiles of dirt, borrow areas, or other areas used solely by the permitted project are considered a part of the project);~~.~~

~~14.8.2.11~~14.12.2.13 Comply with applicable Federal, State and local laws and regulations including waste disposal, sanitary sewer or septic system regulations, and air quality requirements, including dust control;~~.~~

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14.8.2.1214.12.2.14 Prevent significant alteration of habitats mapped by the Massachusetts Natural Heritage & Endangered Species Program as Endangered, Threatened or Of Special Concern, Estimated Habitats of Rare Wildlife and Certified Vernal Pools, and Priority Habitats of Rare Species from the proposed activities;.

14.8.2.1314.12.2.15 Institute interim and permanent stabilization measures, which shall be instituted on a disturbed area as soon as practicable but no more than 14 days after construction activity has temporarily or permanently ceased on that portion of the site;.

14.8.2.1414.12.2.16 Properly manage on-site construction and waste materials to ensure they are not discharged to the MS4, drainage system, or waters of the United States or Commonwealth; and.

14.8.2.1514.12.2.17 Prevent off-site vehicle tracking of sediments.

14.8.314.12.3 Stormwater Management & Erosion and Sedimentation Control Plan Content. The Plan shall contain the following information:

14.8.3.114.12.3.1 Names, addresses, and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan;.

14.8.3.214.12.3.2 Title, date, north arrow, names of abutters, scale, legend, and locus map;.

14.8.3.314.12.3.3 The existing zoning, and land use at the site;.

14.8.3.414.12.3.4 The proposed land use;.

14.8.3.514.12.3.5 Watercourses and water bodies, wetland resource areas and all floodplain information, including the 100-year flood elevation based upon the most recent Flood Insurance Rate Map, or as calculated by a professional engineer for areas not assessed on these maps;.

14.8.3.614.12.3.6 Existing and proposed vegetation including tree lines, canopy layer, shrub layer, and ground cover;.

14.8.3.714.12.3.7 Surveyed property lines showing distances and monument locations, all existing and proposed easements, rights-of-way, and other encumbrances, the size of the entire parcel, and the delineation and number of square feet of the land area to be disturbed;.

14.8.3.8 Habitats mapped by the Massachusetts Natural Heritage & Endangered Species Program as Endangered, Threatened or of Special Concern, Estimated Habitats of Rare Wildlife and Certified

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14.12.3.8 Vernal Pools, and Priority Habitats of Rare Species within five hundred (500) feet of any construction activity;~~.~~

~~14.8.3.9~~14.12.3.9 Lines of existing abutting streets showing drainage and driveway locations, curb cuts and utilities;~~.~~

~~14.8.3.10~~14.12.3.10 Topographical features including existing and proposed contours at intervals no greater than two (2) feet with spot elevations provided when needed;~~.~~

~~14.8.3.11~~14.12.3.11 Proposed improvements including location of buildings or other structures, impervious surfaces, and drainage facilities, if applicable;~~.~~

~~14.8.3.12~~14.12.3.12 Existing soils, volume and nature of imported soil materials;~~.~~

~~14.8.3.13~~14.12.3.13 Location and details of erosion and sediment control measures with a narrative of the construction sequence/phasing of the project, including both operation and maintenance for structural and non- structural measures, interim grading, and material stockpiling areas;~~.~~

~~14.8.3.14~~14.12.3.14 Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;~~.~~

~~14.8.3.15~~14.12.3.15 A drainage area map showing pre and post construction watershed boundaries, drainage area and stormwater flow paths;~~.~~

~~14.8.3.16~~14.12.3.16 Pre and post development stormwater runoff calculations in accordance with the Department of Environmental Protection's Stormwater Management Policy;~~.~~

~~14.8.3.17~~14.12.3.17 A description and drawings of all components of the proposed drainage system including:

~~a.~~• locations, cross sections, and profiles of all brooks, streams, drainage swales and their method of stabilization.

~~b.~~• all measures for the detention, retention or infiltration of water.

~~14.8.3.18~~14.12.3.18 All measures for the protection of water quality.

~~14.8.3.19~~14.12.3.19 The structural details for all components of the proposed drainage systems and stormwater management facilities.

~~14.8.3.20~~14.12.3.20 Notes on drawings specifying materials to be used, construction specifications, and typicals.

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14.8.3.21 14.12.3.21 Path and mechanism to divert uncontaminated water around disturbed areas, to the maximum extent practicable.

14.8.3.22 14.12.3.22 Location and description of industrial discharges, including stormwater discharges from dedicated asphalt plants and dedicated concrete plants, which are covered by this permit.

14.8.3.23 14.12.3.23 Location and description of and implementation schedule for temporary and permanent seeding, vegetative controls, and other stabilization measures.

14.8.3.24 14.12.3.24 A description of construction and waste materials expected to be stored on-site. The Plan shall include a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response.

14.8.3.25 14.12.3.25 A description of provisions for phasing the project where one acre of area or greater is to be altered or disturbed.

14.8.3.26 14.12.3.26 Plans must be stamped and certified by a registered Professional Engineer or ~~qualified Professional Engineer registered in Massachusetts and~~ a Certified Professional in Erosion and Sedimentation Control (CPESC).

14.8.3.27 14.12.3.27 Timing, schedules, and sequence of development including clearing, stripping, rough grading, construction, final grading, and vegetative stabilization.

14.8.3.28 14.12.3.28 A maintenance schedule for the period of construction.

14.8.3.29 14.12.3.29 Any other information requested by the Board.

14.8.3.30 14.12.4 ~~An~~ Operation and Maintenance plan (O&M Plan) is required at the time of application for all projects. The Board will consider natural features, proximity of site to water bodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision. The Operation and Maintenance Plan shall remain on file with the Board and shall be an ongoing requirement. The maintenance plan shall ~~contain the following~~be:

14.8.3.30.1 ~~-~~Designed to ensure compliance with the Permit, this Bylaw, and that the Massachusetts Surface Water Q

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14.12.4.1 ~~Q~~uality Standards, 314, CMR 4.00 are met in all seasons and throughout the life of the system.

~~14.8.3.30.2~~14.12.4.2 The O&M Plan shall be prepared in conformance with the Department of Environmental Protection's Stormwater Management Policy.

~~14.8.3.30.3~~14.12.4.3 The owner(s) of the stormwater management system must notify the Board of changes in ownership or assignment of financial responsibility.

14.12.4.4 The maintenance schedule in the Maintenance Agreement may be amended to achieve the purposes of this by-law by mutual agreement of the Board and the Responsible Parties. Amendments must be in writing and signed by all Responsible Parties. Responsible Parties shall include owner(s), persons with financial responsibility, and persons with operational responsibility during future years.

14.12.4.5 The O&M Plan shall include procedures for using dedicated funds, establishing an escrow account, and/or developing a maintenance contract, if determined appropriate to ensure adequate long-term maintenance.

14.12.4.6 Long-term operators responsible for O&M Plan implementation shall submit an annual report to the Board documenting all inspection and maintenance completed on the stormwater system.

14.13 STORMWATER MANAGEMENT STANDARDS

14.13.1 The following stormwater standards shall be met for all new and redevelopment projects as outlined below.

14.13.2 LID site planning and design strategies must be implemented unless infeasible in order to reduce the discharge of stormwater from development sites;

14.13.3 Stormwater management system design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook;

14.13.4 Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site.

14.13.4.1 Average annual pollutant removal requirements in 14.13.4 are

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achieved through one of the following methods:

- Installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
- Retaining the volume of runoff equivalent to, or greater than, 1.0 inch multiplied by the total post-construction impervious surface area on the new development site; or
- Meeting a combination of retention and treatment that achieves the above standards; or
- Utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the new development site.

14.13.5 Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of TSS related to the total post-construction impervious area on the site AND 50% of the average annual load of TP related to the total post-construction impervious surface area on the site.

14.13.5.1 Average annual pollutant removal requirements in 14.13.5 are achieved through one of the following methods:

- Installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
- Retaining the volume of runoff equivalent to, or greater than, 0.8 inches multiplied by the total post-construction impervious surface area on the redevelopment site; or
- Meeting a combination of retention and treatment that achieves the above standards; or
- Utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the redevelopment site..

14.13.5.2 Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane, adding shoulders, correcting substandard

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intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions where feasible and are exempt from part Section 14.13.5.1. Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of Section 14.13.5.1.

~~14.8.3.30.4~~

~~*14.9.*~~*14.14 PERFORMANCE GUARANTEE*

~~14.9.1~~14.14.1 As a condition of a Stormwater Management and Land Disturbance Permit approval, the Planning Board may require that a performance bond, secured by deposit of money or negotiable securities in the form selected by the Planning Board, be posted with the Town to guarantee that the work will be completed in accordance with the permit. The Board may also require that an amount be included for land restoration not having to do with the construction of improvements. The amount of security shall be determined by an estimate from the applicant's engineer which may be confirmed or increased by the Board. If the project is phased, the Board may release part of the bond as each phase is completed in compliance with the permit but the bond may not be fully released until the Board has received the final report as required by 14.11 and issued a ~~c~~Certificate of ~~completion~~Completion.

~~14.9.2~~14.14.2 The town may use the secured funds for their stated purpose in the event that the applicant does not complete all improvements in a manner satisfactory to the Board within two years from the date of approval, or the final date of the last extension of such approval, if any.

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~~14.10.~~14.15 *INSPECTIONS*

~~14.10.1~~14.15.1 Prior to starting clearing, excavation, construction, or land disturbing activity the applicant, the applicant's technical representative, the general contractor or any other person with authority to make changes to the project, shall meet with the Board and its designated agent, to review the permitted plans and their implementation.

14.15.2 The Board or its qualified designated agent shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the land disturbance permit as approved. Inspections shall be performed by a Professional Engineer (P.E.), a Certified Professional in Erosion and Sediment Control (CPESC), or a suitably qualified person as determined by the Board.

~~14.10.2~~14.15.3 The Permit and associated plans for grading, stripping, excavating, and filling work, bearing the signature of approval of the Board, shall be maintained at the site during the progress of the work. In order to obtain inspections, the permittee shall notify the Board or its designated agent at least two (2) working days before each of the following events:

~~14.1021~~14.15.3.1 Erosion and sediment control measures are in place and stabilized, and site clearing limits are clearly marked in the field.

~~14.1022~~14.15.3.2 Site Clearing has been substantially completed

~~14.1023~~14.15.3.3 Rough Grading has been substantially completed

~~14.1024~~14.15.3.4 Final Grading has been substantially completed

~~14.1025~~14.15.3.5 Close of the Construction Season; stabilization of the site.

~~14.1026~~14.15.3.6 Final Landscaping (permanent stabilization) and project final completion.

~~14.10.3~~ The permittee or his/her agent shall conduct and document inspections of all control measures no less than weekly or as specified in the permit, and following storm events greater than 0.5 inches. The purpose of such inspections will be to determine the overall effectiveness of the control plan, and the need for maintenance or additional control measures. The permittee or his/her agent shall submit bi-weekly reports to the Board or designated agent in a format approved by the Board.

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14.15.4

~~14.10.4~~14.15.5 To the extent permitted by State law, or if authorized by the owner or other party in control of the property, the Board, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this by-law and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary to determine compliance with the permit.

~~*14.11.*~~*14.16 FINAL REPORTS*

~~14.11.1~~14.16.1 Upon completion of the work, the permittee shall submit a report (including certified as-built construction plans) from a Professional Engineer (P.E.) or ~~Professional Land Surveyor (P.L.S.), and~~ a Certified Professional in Erosion and Sediment Control (CPESC), certifying that all erosion and sediment control devices, and approved changes and modifications, have been completed in accordance with the conditions of the approved permit. As-built drawings should be submitted no later than one year after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management). Any discrepancies should be noted in the cover letter.

~~14.11.2~~14.16.2 The issuing authority will issue a letter certifying completion upon receipt and approval of the final reports and/or upon otherwise determining that all work of the permit has been satisfactorily completed in conformance with this bylaw.

~~*14.12.*~~*14.17 ENFORCEMENT*

~~14.12.1~~14.17.1 The Board or an authorized agent of the Board shall enforce this by-law, regulations, orders, violation notices, and enforcement orders, and may pursue all non-criminal dispositions for such violations.

~~14.12.2~~14.17.2 The Board or an authorized agent of the Board may issue a written order to enforce the provisions of this by-law or the regulations thereunder, which may include:

~~14.122.1~~14.17.2.1 A requirement to cease and desist from the land-disturbing activity until there is compliance with the bylaw and provisions of the land- disturbance permit.

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~~14.1222~~14.17.2.2 Maintenance, installation or performance of additional erosion and sediment control measures.

~~14.1223~~14.17.2.3 Monitoring, analyses, and reporting.

14.17.2.4 Remediation of erosion and sedimentation resulting directly or indirectly from the land-disturbing activity.

14.17.2.5 Repairing, maintenance, or replacement of the stormwater management system or portions thereof in accordance with the operation and maintenance plan.

14.17.2.6 Remediation of adverse impact resulting directly or indirectly from malfunction of the stormwater management system or erosion and sediment control system.

14.17.2.7 A requirement to cease and desist from unlawful discharges, practices, or operations.

~~14.1224~~14.17.2.8 Remediation of contamination in connection therewith.

14.17.3 If a person violates the provisions of this Bylaw, permit, notices, or order issued thereunder, the Board may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

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~~14.12.3~~14.17.4 If the enforcing person determines that abatement or remediation of erosion and sedimentation is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town of Groveland may, at its option, undertake such work, and the property owner shall reimburse the Town of Groveland's expenses.

~~14.12.4~~ Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner shall be notified of the costs incurred by the Town of Groveland, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty

14.17.5 (30) days following a decision of the Board affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate, as provided in G.L. c. 59, § 57, after the thirty-first day following the day on which the costs were due.

14.17.6 Any violation of this by-law, any regulation promulgated hereunder, or any Stormwater Management and Land Disturbance Permit, will be punishable by non-criminal disposition under G.L. c. 40, Section 21D. The ~~Town of Groveland, in which case, the~~ Planning Board or authorized agent shall be the enforcing person. The penalty for the 1st violation shall be $250. The penalty for the 2nd violation shall be $300. The penalty for the 3rd and subsequent violations shall be $300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

14.17.7 The Board may waive strict compliance with any requirement of this Bylaw promulgated hereunder, where:

14.17.7.1 Such action is allowed by federal, state and local statutes and/or regulations,

14.17.7.2 Is in the public interest,

14.17.7.3 A public safety issue exists, or

14.17.7.4 Waiver is not inconsistent with the purpose and intent of this Bylaw.

14.17.8 Any applicant may submit a written request to be granted such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the

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waiver request and demonstrating that strict application of this bylaw does not further the purposes or objectives of this bylaw. The Board may require documentation to be submitted and stamped by a qualified registered P.E. or a CPESC.

14.17.9 The remedies listed in this bylaw are not exclusive of any other remedies available under any applicable federal, state or local law.

~~14.12.5~~14.17.10 The Board may require the permittee to post before the start of land disturbance or construction activity, a surety bond, irrevocable letter of credit, cash, or other acceptable security. The form of the bond shall be approved by Town counsel, and be in an amount deemed sufficient by the Board to ensure that the work will be completed in accordance with the permit. If the project is phased, the Board may release part of the bond as each phase is completed in compliance with the Stormwater Management and Land Disturbance Permit but the bond may not be fully released until the Board has received the final inspection report and issued a Certificate of Completion.

~~14.4.4~~***14.18*** ***~~13.13.~~ SEVERABILITY***

14.18.1 ~~14.13.1~~ If any provision, paragraph, sentence, or clause of this by-law shall be held invalid for any reason, all other provisions shall continue in full force and effect.

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~~*14.14*~~*14.19 GENERAL*

~~14.14.1~~14.19.1 Any application not accompanied by the appropriate fee shall be deemed incomplete. Payment must be made to the Town of Groveland in cash, money order, bank or certified check payable to the Town of Groveland.

~~14.14.2~~14.19.2 An Applicant's failure to pay any additional review or inspection fee within five business days of receipt of the notice that further fees are required shall be grounds for disapproval.

~~14.14.3~~14.19.3 The Applicant or the Applicant's representative will publish the public notice and send abutter notifications. Abutter notification shall be by certified mail- return receipt requested. The applicant shall provide the Planning Board with copies of the public notices and the return receipt cards.

~~14.14.4~~14.19.4 Professional review fees include engineering review, legal review, and clerical fees associated with the public hearing and permit processing. A fee estimate may be provided by the Planning Board's consulting engineer.

Adopted at Annual Town Meeting held April 30, 2007

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END OF BYLAW