

***Town and Village of Woodstock, Vermont***  
***Multi-Jurisdictional Hazard Mitigation Plan***

**January 2015 Draft**

***Prepared by the Two Rivers-Ottawaquechee Regional Commission, the  
Town of Woodstock and the Woodstock Village Board of Trustees***

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## I. Introduction

Natural and human-caused hazards may affect a community at any time. They are not usually avoidable; however, their impact on human life and property can be reduced through community planning. Accordingly, this Multi-Jurisdictional Hazard Mitigation Plan (hereafter referred to simply as the Plan) seeks to provide an all-hazards mitigation strategy that will make the Town and Village of Woodstock more disaster resistant.

“Mitigation” is defined as any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Previous Federal Emergency Management Agency (FEMA), State and Regional Project Impact efforts have demonstrated that it is less expensive to anticipate disasters than to repeatedly ignore a threat until the damage has already been done. While hazards cannot be eliminated entirely, it is possible to identify prospective hazards, anticipate which might be the most severe, and recognize local actions that can be taken ahead-of-time to reduce the damage. These actions, also known as “hazard mitigation strategies,” can (1) avert the hazards through redirecting impacts by means of a structure or land treatment, (2) adapt to the hazard by modifying structures or standards or, (3) avoid the hazard through improved public education, relocation/removal of buildings in the flood zone, or ensuring development is disaster resistant.

## II. Purpose of the Plan

The purpose of this Multi-Jurisdictional Hazard Mitigation Plan is to assist the Town and Village of Woodstock in identifying all hazards, ranking them, and identifying strategies to reduce risks from known priority hazards. This Plan addresses and includes the Town's one incorporated village of Woodstock. Reference to "Woodstock" and the "Town of Woodstock" should be considered to include the Village of Woodstock, unless specifically noted otherwise.

Both the Town and Village of Woodstock seek to be in accordance with the strategies, goals, and objectives of the State Hazard Mitigation Plan.

The 2015 Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan is the first stand-alone mitigation plan drafted for the Town and Village. Previously, the Town and Village had a Woodstock-specific 2011 Annex in the Regional Pre-Disaster Mitigation Plan. This new Plan has been reorganized and new sections have been added:

- Program eligibility subsequent to plan approval
- Authority for plan development
- Participating jurisdictions
- Funding for plan development
- Brief information about the community

Old assumptions have been challenged throughout, and new information has been added to make the plan stronger and more useful for the Woodstock town officials and residents who will implement the hazard mitigation strategies in the future.

## III. Community Profile

Woodstock has an especially picturesque setting. Located on a relatively broad plain at the intersection of the Town's main waterways, it is surrounded by high hills. The Ottauquechee River flows west to east through the Town, Kedron Brook flows north from Reading, and Barnard Brook flows south from Pomfret; these main waterways parallel the Town's main roads – U.S. Route 4 along the Ottauquechee, Vermont Route 106 along the Kedron, and Vermont Route 12 along Barnard Brook. Routes 106 and 12 serve mostly local traffic. U.S. Route 4 serves local traffic, but is also the main east-west highway across central Vermont.

Located near the center of Windsor County, Woodstock comprises an area of 27,384 acres. The Village occupies 726 acres at the intersection of State Routes 12 and 106 with U.S. Route 4. In addition to the Village, the Town has four other smaller communities (that are not legal entities) – South Woodstock, West Woodstock, Taftsville, and Prosper – each with its own institutions. The balance of the Town is essentially rural; its southwest corner is largely undeveloped. Most of the Town is considered part of the Vermont Piedmont, although the southwest corner of the Town is classified as an eastern extremity of the Inter-Mountain Valley Region of the Green Mountains.

During 1990 to 2010, according to the U.S. Census Reports, Woodstock's population declined by 164 (-5.1%) persons. The Town's population peaked in 2000, with 3,232 residents, before falling to the current level of 3,048. The population has not been below 3,200 since prior to the 1980 census, when the population stood at 3,214. While there has been a decline in population numbers in the decade between 2000 and 2010, there was a rise in the number of housing units in the Town (due to seasonal homes). There has been a 6.6% increase in the number of units in Woodstock, bringing the total number of units to 1,893 (up from 1,775 in 2000).

Woodstock's electricity is supplied by Green Mountain Power. To anticipate required electrical loads, GMP roughly expects one to two percent growth in electrical energy requirements per year per company. Strong economics can bring these figures to three or four percent, though a bad year can drop need level to less than one percent.

Fire protection, ambulance, dispatch services, town police department, and constables are currently housed together in a one-story brick and block building located on the East End of the Village on Route 4. Space for vehicles is adequate for the next few years, but office space is inadequate.

Fire protection is provided by two pumpers, one pumper/tanker, and one rescue truck. The Woodstock Fire Department Rescue truck is the newest vehicle in the fleet, while a 1991 pumper is the oldest vehicle in the fleet. It is scheduled to be replaced. The Town and Village of Woodstock are serviced by two departments, the Woodstock and the South Woodstock Fire Departments, and the two departments respond to all calls together, although the Woodstock Fire Department is the primary fire department for all calls within the Town of Woodstock's boundaries. The Woodstock Fire Department operates two stations; one at the East End of the Village and one on U.S. Route 4 in West Woodstock where one ambulance and one fire truck are housed. Ten firefighters respond out of the station located in West Woodstock. The South Woodstock fire department, also known as the South Woodstock Fire Protection Association Inc., and has one Class A pumper, one mini-pumper, and a 2300 gallon tanker/pumper. Both the Town and South Woodstock departments are members of the Mutual Aid Program. This arrangement is planned to continue for the foreseeable future. Within ten years the South Woodstock Fire Protection Association, Inc. will need to replace one truck, the mini pumper, as a major purchase.

The Woodstock Ambulance Service (licensed as a paramedic service) serves the towns of Woodstock, Pomfret, Bridgewater, Plymouth, Reading, and Hartland with three vehicles that are replaced on a staggered basis every three years. The oldest vehicle on the fleet can be no more than nine years old. Development and its impacts on ambulance demand should continue to be monitored to predict when upgrades will be needed. The closest hospital is the Dartmouth Hitchcock Medical Center located in Lebanon, NH. Medivac services are available by the DHART helicopter.

The Village and Town are being served by the Village police department, two elected Constables with backup provided by the Vermont State Police, Troop "D" located in Bethel.

## IV. The Planning Process

### A. Plan Developers

Samantha Holcomb and Ellie Ray, both Land Use Planners at the Two Rivers-Ottawaquechee Regional Commission (TRORC), assisted the Town and Village of Woodstock with updating their Hazard Mitigation Plan. The planning process involved representatives from both the Town and Village of Woodstock. Committee members who assisted with the revisions include:

This section of the Plan satisfies 44 CFR 201.6(b)(1) and 201.6(c)(1) (or, A3.a and A3.b of FEMA's Local Mitigation Plan Review Guide, 2011).

Name	Role/Organization	How Participation Was Solicited
Phil Swanson	Town/Village Manager/LEPC Representative	On 01/19/2014, Samantha Holcomb and Ellie Ray (TRORC staff) reached out to the Woodstock Selectboard, the Town Manager (Philip Swanson), and the EMD/EMC (Dwight Camp). TRORC staff coordinated with Woodstock town officials to set up an introductory meeting. The first meeting was scheduled for 03/26/2014. TRORC's staff attended that meeting, followed by many more meetings in which participants revised and developed the HMP. See below for more meeting-specific details.
Michael Brands	Woodstock Town/Village Planner	
Robbie Blish	Woodstock Police Chief	
Ken Vandenburg	Woodstock Highway Superintendent	
Carol Cunningham	Mertens House Administrator	
Dwight Camp	Woodstock Emergency Director/LEPC Representative	
L.D. "Butch" Sutherland	Woodstock Fire Department, Chief	

#### Additional Participants in the Process:

- Rod Leonard, Woodstock Fire Department, Assistant Chief
- David Green, Vermont State Fire Marshall & Woodstock Fire Department Captain
- Chip Kendall, Woodstock Fire Department
- Alan Beebe, Woodstock Ambulance Service Director
- Lisa Linton, Woodstock Ambulance Service
- Town of Woodstock Selectboard
- Village of Woodstock Board of Trustees
- Woodstock Aqueduct Company

## B. Plan Development Process

The 2011 Woodstock Annex was originally part of the 2008 multi-jurisdictional Regional Hazard Mitigation Plan, drafted by Two Rivers-Ottawaquechee Regional Commission, and approved by FEMA on September 30, 2008 with its first local annex. The Woodstock Annex received subsequent FEMA approval, but, since it was part of a larger plan, FEMA treats its start date as September 30, 2008, meaning the Woodstock Annex expired on September 30, 2013.

This section of the Plan satisfies the Element A: Planning Process requirements set out in 44 CFR 201.6.

This Plan has been reconstructed now as a stand-alone Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan that will be submitted for individual approval to FEMA. As such, several sections have been added or updated to include all necessary information.

The changes to this Plan include:

- **General**
  - New sections: Plan Development Process, 2011 Mitigation Strategies Status Update chart, Existing Hazard Mitigation Programs, Projects & Activities, Plan Maintenance;
  - Data updates: New hazard incidents, emergency declarations, census data;
  - Hazards have been reevaluated with the hazard ranking system used by the Vermont Division of Emergency Management and Homeland Security.
- **Hazards Analysis**
  - Flash Flood/Flood/Fluvial Erosion, Structural Fires, Wildfires, and Hazardous Material Spills remain on the list of “top hazards” which reflect the local officials’ belief that the Town and Village are still vulnerable to these hazards;
  - Water Supply Contamination has been added to the list of “top hazards,” which reflects the intention/priorities of local officials to expand their analysis of hazards that the Town/Village is or may vulnerable to in the next five years;
  - For each hazard, a location/vulnerability/extent/impact/likelihood table has been added to summarize the hazard description.
- **Maps**
  - A map of the Town and Village of Woodstock depicting critical facilities, town infrastructure, and the NFIP designated floodway and 100-year and 500-year floodplain has been added.

The following represent the avenues taken to draft the Woodstock Hazard Mitigation Plan:

- **Activities**
  - 03/26/2014: Met with Woodstock HMP Committee members to introduce the update/plan development process, reviewed Woodstock’s existing Hazard Mitigation Plan (adopted in June 2011), considered the status of various mitigation actions, potential hazards, and the data collection/research process.

- 04/02/2014: Met with Woodstock HMP Committee members to discuss and rank hazards to determine the “Top Hazards” in the Town and Village. Explained to the Committee what the next steps in the process would be (TRORC would draft plan, then schedule a meeting to review and discuss it).
- 07/15/2014: Met with Committee to discuss first draft. The entire draft was reviewed in detail, with TRORC staff making note of any comments or errors.
- 10/02/2014: Met with the Woodstock HMP Committee to discuss and identify Hazard Mitigation Strategies for each “Top Hazard” addressed in the Plan.
- 01/13/2015: TRORC staff attended a Woodstock Village Board of Trustees meeting to inform Village residents about the work that had been done to update the Town and Village’s Hazard Mitigation Plan. The Village Board of Trustees agenda is posted at the Town Office, and the draft Hazard Mitigation Plan was posted on the Town/Village’s website in advance of the public information session. TRORC staff asked for comments at the meeting, but no comments were received.
- 01/20/2015: TRORC staff attended a Woodstock Selectboard meeting to inform Town residents about the work that had been done to update the Town and Village’s Hazard Mitigation Plan. The Selectboard agenda is posted at the Town Office, and the draft Hazard Mitigation Plan was posted on the Town/Village’s website in advance of the public information session. TRORC staff asked for comments at the meeting, but none were received.
- **Public participation and involvement (44 CFR 201.6(b)(1))**
  - June 2014: A notice was placed in the Two Rivers-Ottawaquechee Regional Planning Commission Newsletter alerting recipients that Woodstock was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan. Contact information was provided in the notice to allow those interested in Woodstock’s efforts to receive more information and how to find out about upcoming meetings. No comments were received.
  - Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place. Contact information was provided in the notice to allow those interested in Woodstock’s efforts to receive more information and how to find out about upcoming meetings. No comments were received.
    - Valley News—ran 03/20/2014
    - The Herald of Randolph—ran 03/20/2014
    - Journal Opinion—ran 03/20/2014
    - Vermont Standard—ran 03/20/2014
  - 01/13/2015: TRORC staff attended a Woodstock Village Board of Trustees meeting to inform Village residents about the work that had been done to update the Town and Village’s Hazard Mitigation Plan. The Village Board of Trustees agenda is posted at the Town Office, and the draft of the Multi-Jurisdictional Hazard Mitigation Plan was posted on the Town/Village’s website in advance of the public information session. TRORC staff asked for comments at the meeting, but no comments were received.

- Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place. Contact information was provided in the notice to allow those interested in Woodstock's efforts to receive more information and how to find out about upcoming meetings. No comments were received.
  - Valley News—ran 01/15/2015
  - The Herald of Randolph—ran 01/15/2015
  - Journal Opinion—ran 01/15/2015
  - Vermont Standard—ran 01/15/2015
- 01/20/2015: TRORC staff attended a Woodstock Selectboard meeting to inform Town residents about the work that had been done to update the Town and Village's Hazard Mitigation Plan. The Selectboard agenda is posted at the Town Office, and the draft Hazard Mitigation Plan was posted on the Town/Village's website in advance of the public information session. TRORC staff asked for comments at the meeting, but no comments were received.
- **Governmental participation and involvement (44 CFR 201.6(b)(2))**
  - Sent revised draft to the Town of Woodstock Selectboard Chair and provided contact information for receiving comments via hard copy/email—11/14/2014
    - No comments were received.
  - Sent revised draft to the Woodstock Village Board of Trustees and provided contact information for receiving comments via hard copy/email—11/14/2014
    - No comments were received.
  - Sent revised draft to Planning Commission Chair and provided contact information for receiving comments via hard copy/email—11/14/2014
  - Sent revised draft to the Woodstock Aqueduct Company and provided contact information for receiving comments via hard copy/email—11/14/2014
    - Received minor edits/comments on 12/01/2014 and were incorporated into the Water Supply Contamination section of this Plan.
  - Sent revised draft to Marsh-Billings-Rockefeller National Historic Park (National Park Service) and provided contact information for receiving comments via hard copy/email—11/14/2014
    - No comments were received.
  - Sent revised draft to the Northwest Regional Planning Commission— 01/20/2015
    - No substantive comments were received.
  - Sent revised draft to Vermont Division of Emergency Management and Homeland Security—01/23/2015
- **Neighboring community participation and involvement (44 CFR 201.6(b)(2))**
  - June 2014: A notice was placed in the Two Rivers-Ottawaquechee Regional Planning Commission Newsletter alerting recipients that Woodstock was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan. Contact information was provided in the notice to allow those interested in Woodstock's efforts to receive more information and how to find out about upcoming meetings. No comments were received.

- Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place. Contact information was provided in the notice to allow those interested in Woodstock's efforts to receive more information and how to find out about upcoming meetings. No comments were received.
  - Valley News—ran 03/20/2014
  - The Herald of Randolph—ran 03/20/2014
  - Journal Opinion—ran 03/20/2014
  - Vermont Standard—ran 03/20/2014
- Sent revised draft to neighboring towns' Selectboards for comment—11/14/2014
  - Towns of: Bridgewater, Hartford, Hartland, Pomfret, and Reading.
  - Received comments from Hartford Selectboard member on 12/01/2014, but none were substantive and not incorporated into this Plan.
- Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place. Contact information was provided in the notice to allow those interested in Woodstock's efforts to receive more information and how to find out about upcoming meetings. No comments were received.
  - Valley News—ran 01/15/2015
  - The Herald of Randolph—ran 01/15/2015
  - Journal Opinion—ran 01/15/2015
  - Vermont Standard—ran 01/15/2015
- **Review of existing plans, studies, reports, and technical information (44 CFR 201.6(b)(3))**
  - Woodstock Hazard Mitigation Plan (Adopted 06/07/2011)
    - This plan was referenced extensively during the Plan development process, especially in regard to the worst threats and mitigation action strategies identified in 2011.
  - Woodstock Town and Village Master Plan (Adopted 05/20/2014)
    - The Town Plan provided TRORC's staff with background information on the community, as well as more detail on their emergency services.
  - Woodstock Zoning Regulations (Adopted 06/15/2010) and Woodstock Village Zoning Regulations (Adopted 01/10/2012)
    - The Zoning Bylaws were referenced for general knowledge and for Woodstock's Flood Hazard Regulations.
  - Woodstock's Local Emergency Operations Plan
    - Last adopted 05/20/2014
    - This Plan provided TRORC's staff with general information about Woodstock's emergency operations.
  - Woodstock Aqueduct Source Protection Plan
    - Woodstock Aqueduct Source Protection Plan was referenced when drafting the Water Supply Contamination section of this Plan.

This section of the Plan satisfies 44 CFR 201.6(b)(3) (or, A4.a and A4.b of FEMA's Local Mitigation Plan Review Guide, 2011).

- Ottawaquechee River Watershed Stream Geomorphic Assessment, Bridgewater and Woodstock, Vermont (1/29/2013)
  - This information was incorporated into the mapping/GIS components of this Plan; specifically in helping to determine the number of structures that are vulnerable to flooding.
  - This document also provided background information on the Ottawaquechee River and its tributaries, which was incorporated into the Flash Flood/Flood/Fluvial Erosion section of this Plan.
- Flood Insurance Study for Windsor County, Vermont (Dated 09/28/2007)
  - The Flood Insurance Study was referenced for general knowledge of the Ottawaquechee River and peak discharge information.
  - Relevant peak discharge information for the Ottawaquechee River can be found on page 24 of Volume 1.
  - This information was incorporated into the mapping/GIS components of this Plan; specifically in determining the number of structures that are vulnerable to SFHA, and into the Flash Flood/Flood/Fluvial Erosion section of this Plan.

### C. Status Update on Mitigation Actions Identified in 2011

The following table outlines the mitigation actions that were proposed in Woodstock's 2011 All-Hazard Pre-Disaster Mitigation Plan for the Town of Woodstock (adopted on June 7, 2011 as an appendix to the Two Rivers-Ottawaquechee Regional Commission's multi-jurisdictional Regional Pre-Disaster Mitigation Plan).

This section of the Plan satisfies the requirements of 44 CFR 201.6(d)(3).

This plan has been revised to reflect progress in local mitigation efforts.

Participants in the new Plan update process reviewed these actions and reported on the status of each:

Mitigation Action	Who (Leadership)	When (Timeframe)	How (Funding/Support)	2015 – Status of Mitigation Actions
<u>ALL HAZARDS</u>  1. Ensure that the Basic Emergency Operations Plan (BEOP) is current.	Selectboard	Yearly	With TRORC assistance	Updated annually. The newest version of the BEOP is the Local Emergency Operations Plan (LEOP). The Town's LEOP was completed and signed on 05/20/2014 by the Selectboard.
2. Use the Pre-Disaster Mitigation (PDM) plan for Hazard Identification and Mapping.	Emergency Management Coordinator	Ongoing	With TRORC assistance	The following projects have been completed in support of the Town's PDM Plan goals: Public education, proper road maintenance, Route 4 rumble strips, culvert/bridge upgrades, and upgrading traffic enforcement.
3. Update existing Emergency Operations Plan.	Emergency Management Coordinator	Yearly	With TRORC assistance	The EOP was completed and signed on 4/15/2014, and subsequently adopted by the Selectboard.
<u>FLOOD</u>  4. Continue the planned road maintenance program and update existing culvert inventory. Upgrade culverts and ditching.	Highway Department	Ongoing	Local resources	On-going. Several road upgrade projects have been completed in recent years.
<u>FIRE</u>  5. Develop additional dry hydrant sites in rural locations.	Fire Department	Ongoing	Local resources	The Town has installed many dry hydrants over recent years and is now well covered.

<u>HAZMAT</u>				
6. Pursue HAZMAT training for Fire Department.	Fire Department	2010	Funded by Fire Service Training Academy	There is currently one member in training. The Fire Department trains annually to the Awareness level. One member is currently training to the Operations level.

Aside from the fact that the Village of Woodstock has some commercial development and attracts tourists during all seasons of the year (though mostly in the summer and fall), Woodstock, overall, is a pretty sleepy town. The population of the Town of Woodstock has remained static, and there is very little development in the Town of Woodstock.

However, the biggest development project proposed in the Town in quite some time recently made it through nine years of court battles. This project is a 36 unit affordable housing project, Safford Commons, which is scheduled to break ground in September 2014 at the former Rock Church site in West Woodstock. Aside from this project, there are no other development projects that are set to begin construction or are on the horizon. Outside of the Village of Woodstock, the Town is rural in character.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3).

#### **D. Existing Hazard Mitigation Programs, Projects & Activities**

The Town and Village of Woodstock are currently engaged in the following hazard mitigation programs, projects and activities:

	<b>Type of Existing Authority / Policy / Program / Action</b>	<b>Resources: Staffing &amp; Funding</b>	<b>Ability to Expand/Improve on</b>
<b>Community Preparedness Activities</b>	Program—Annual update of Woodstock's Local Emergency Operations Plan (LEOP). Last updated and approved on 05/20/2014.	Updated by the Municipal Manager/Emergency Management Coordinator, assistance from TRORC and funding from Vermont DEMHS.	Current program works well, no need to expand or improve on. The LEOP is reviewed and updated each year. The Village of Woodstock is included in the Town of Woodstock's LEOP.
	Program—Maintains and updates an Emergency Operations Plan (different than the LEOP). Last updated and approved on 04/15/2014.	Updated by the Municipal Manager/Emergency Management Coordinator and emergency response personnel. Funding from local budgets.	Current program works well, no need to expand or improve on.
	Completed Action— Designated Red Cross Shelters at both the Elementary School (has a backup generator) and the High School (no backup generator).	Staff time from the Municipal Manager and perhaps other emergency management personnel. Funding from American Red Cross.	One time action.
	Program— Participation/attendance in the Local Emergency Planning Committee District 12 (LEPC 12)	Staff/volunteer time from the Woodstock Fire Departments; meetings convened by TRORC. Funding from Vermont DEMHS.	No need to expand or improve on attendance.

<p><b>Insurance Programs</b></p>	<p>Authority/ Program—participation in National Flood Insurance Program (NFIP)</p> <p>The Town and Village participate and comply with the NFIP through their enforcement of the “Flood Hazard District” overlay district, which was adopted 06/15/2010 and 01/10/2012, respectively. They are kept up-to-date and regulate new development in the Special Flood Hazard Area (SFHA).</p> <p>[Note: This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3)(ii).]</p>	<p>The Woodstock Zoning Administrator serves as the NFIP Administrator for both entities. Assistance from TRORC and Vermont ANR. Funding from local resources—annual budget.</p>	<p>The Town’s initial Flood Hazard Boundary Map was identified on 8/9/74. The Town’s initial Flood Insurance Rate Map (FIRM) was dated 12/15/78. The Village’s initial Flood Hazard Boundary Map was identified on 09/13/74. The Village’s initial Flood Insurance Rate Map (FIRM) was dated 02/15/79. The Town and Village’s FIRM and the Flood Insurance Study (FIS) has been updated, and the current effective date for all is 09/28/07.</p>
<p><b>Land Use Planning</b></p>	<p>Policy/Program— Woodstock Town and Village Master Plan.</p> <p>Adopted on 05/20/2014</p>	<p>Staff time from the Planning Department, volunteer time from Planning Commission, and assistance from TRORC and other state agencies on specific subject matter. Funding from Municipal Planning Grants and local budget.</p>	<p>The Master Plan is updated every five years, as required by statute. The Planning Commission/Department may expand or improve on any section it deems necessary, or that is required by changes in state statute.</p>
	<p>Completed Authority— Woodstock Town &amp; Village Zoning Regulations</p> <p>Adopted 06/15/2010 and 01/10/2012, respectively, includes “Flood Hazard District” (FHD) overlay district</p>	<p>Staff time from the Planning Department; volunteer time from the Planning Commission/Town Selectboard/Village Board of Trustees, and assistance from TRORC. Funding from Municipal Planning Grants, and local budgets.</p>	<p>During the Master Plan review/update period, the Zoning Regulations are also reviewed and updated if needed.</p>
	<p>Authority— Woodstock Village Ordinance</p> <p>Adopted 09/25/1989, and revised on 05/10/2009.</p> <p>Includes provisions on topics such as: animals; buildings; business licenses and registration; health and safety; newsracks; streets, highways and sidewalks; traffic, vehicles and parking; village green, parks and public places; and yard sales and auctions.</p>	<p>Staff time from Planning Department, volunteer time from the Village Board of Trustees. Funding from Municipal Planning Grants and local budgets.</p>	<p>The Ordinance may be revised by the Board of Trustees when deemed appropriate to do so.</p>

<b>Hazard Control &amp; Protection of Critical Infrastructure &amp; Facilities</b>	<p>Policy/Program—Woodstock Hazard Mitigation Plan</p> <p>Last adopted on 06/07/2011</p>	<p>Updated with paid and volunteer time from local officials and assistance from TRORC and Vermont DEMHS. Funding from DEMHS/FEMA.</p>	<p>The 2015 Woodstock Hazard Mitigation Plan will replace the 2011 Plan. The 2015 HMP has evolved from the 2011 Plan and has greatly expanded and improved upon it. Both the Town and Village of Woodstock will be included in the 2015 Multi-jurisdictional Plan. Future iterations of the Town's LHMP will be updated by the Town at least every five years.</p>
	<p>Authority— Highway Ordinance, Town of Woodstock, Vermont</p> <p>Adopted 05/03/2005, last amended on 05/15/2007</p>	<p>Staff time from Municipal Manager and Highway Superintendent. Funding from local budgets.</p>	<p>Regulates maintenance, upgrading and construction of the Town's highways. May be amended as needed.</p>
	<p>Program—Better Backroads culvert inventory completed in fall 2014 for the Town and Village of Woodstock</p> <p>This inventory includes georeferenced locations and attributes for all culverts/drop inlets in Woodstock. Both the Town and Village received targeted assistance in the culvert inventory and specific priority projects were identified for both entities. See Appendix D and E.</p>	<p>Staff time from Woodstock Highway Superintendent, Village Road Foreman and Municipal Manager; assistance from TRORC. Funding from Better Backroads grant; local personnel time.</p>	<p>The Town/Village is currently using the culvert inventory to further its culvert improvement program, and seeking funding through various sources for implementation projects. There is no need to expand or improve on this program at this time.</p>
<b>Education/ Public Outreach</b>	<p>Completed Action— Public training related to Red Cross Shelter designation held on 03/03/2014.</p>	<p>Staff time from Municipal Manager and volunteer time from Woodstock Emergency Management Coordinator. Funding from American Red Cross.</p>	<p>This is a one-time action, and improving/expanding upon it is not necessary.</p>
	<p>Completed Action— Reinstated phone tree system to dial all residents in the event of an emergency.</p>	<p>Staff time from Municipal Manager and Woodstock Police Department/Woodstock Fire Department. Funding from local budgets (Town/Village, emergency services).</p>	<p>This is a one-time action, but the phone tree should be maintained for accuracy.</p>
	<p>Completed Action— Public education following Irene (distribution of magnets, pamphlets) on how to prepare for an emergency.</p>	<p>Staff time from Municipal Manager and Woodstock Police Department/Woodstock Fire Department. Funding from local budgets (Town/Village, emergency services).</p>	<p>This is a one-time action, but the public emergency preparedness should be maintained.</p>
	<p>Ongoing Action/Program— Town/Village posts tips continually on Facebook, Twitter, and the Town website regarding safety and road closures.</p>	<p>Staff time from Woodstock Administration personnel and Woodstock emergency services personnel. Funding from local budgets.</p>	<p>This is an ongoing action/program, and currently works well so there is no need to expand/improve on it at this time.</p>

## E. Plan Maintenance

This Plan (the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan) will be evaluated annually, by discussing its effectiveness and making note to incorporate any necessary revisions in the update process, at an April Selectboard/Village Board of Trustees meeting, along with the review of their Local Emergency Operations Plan (LEOP). At this meeting, the Selectboard/Town of Trustees will monitor the implementation of the hazard mitigation strategies outlined in this Plan, by noting those that have been completed and any comments from local officials and the public will be incorporated when relevant. This meeting will constitute an opportunity for the public and other town officials to hear about the town's progress in implementing mitigation strategies and to give input on future activities and Plan revisions. The public will be given the opportunity to comment at this meeting.

Updates and evaluation of this Plan by the Selectboard/Board of Trustees and the local Emergency Coordinator/Director will also occur within three months after every federal disaster declaration directly impacting the Town and/or Village of Woodstock. The Town and Village will monitor, evaluate and update this Local Hazard Mitigation Plan at an April Selectboard meeting and after every federally declared disaster directly impacting the Town and/or Village according to the graphic on page 43. The Town and Village shall reference the Multi-Jurisdictional Hazard Mitigation Plan when working on Town Plan amendments or changes to the Town's bylaws.

This section of the Plan satisfies 44 CFR and 201.6(c)(4)(i), 201.6(c)(4)(ii), and 201.6(c)(4)(iii).

At least one year before the Plan expires, the update process will begin (through annual updates, monitoring of progress and evaluation that will occur at the April Selectboard/Board of Trustees meeting). For this next Plan update, the Two Rivers-Ottawaquechee Regional Commission (TRORC) will help with Plan updates if the Town and Village of Woodstock requests assistance and if funding is available. If TRORC is unable to assist the Town, then Woodstock's Town Clerk, Administrative Assistant, or Selectboard/Board of Trustees will update the Plan, or the Selectboard/Board of Trustees may appoint a committee of interested citizens (including the current local Emergency Coordinator/Director) to draft changes. Ultimately, it will be the Town/Village's responsibility to update their Local Hazard Mitigation Plan.

The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice within the municipal building, and notice in Valley News of White River Junction, and the TRORC newsletter and blog, inviting the public to the scheduled Selectboard (or specially scheduled) meeting. The public will be given the opportunity to comment during this process. Additional stakeholders may be invited to the meeting; these include: Woodstock Ambulance Service, Inc., the Woodstock Aqueduct Company, senior citizen centers, VTrans and the Vermont Agency of Natural Resources (VT ANR). VT ANR will be invited because they can provide assistance with NFIP outreach activities in the community, models for stricter floodplain zoning regulations, delineation of fluvial erosion hazard areas, and other applicable initiatives. These efforts will be coordinated by the Municipal Manager.

Updates may include changes in community mitigation strategies; new town bylaws, zoning and planning strategies; progress on the implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities. If new actions are identified in the interim period, the plan can be amended without formal re-adoption during regularly scheduled Selectboard meetings.

Woodstock Town and Village shall also incorporate mitigation planning into their long-term land use and development planning documents. The 2013 Vermont Legislature passed a law requiring all towns to incorporate flood resiliency elements into their town plans as of July 2014. To do so, flood hazard and fluvial erosion hazards will be identified, and strategies and recommendations will be provided to mitigate risks to public safety, critical infrastructure, historic structures and public investments. This Multi-Jurisdictional Local Hazard Mitigation Plan will help the Town and Village to comply with the new community flood resiliency requirement for municipal plans adopted after July 2014.

It is also recommended that the process work both ways, and that the Town and Village review and incorporate elements of the Multi-Jurisdiction Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/ fluvial erosion hazards (FEH) bylaws. The incorporation of the goals and strategies listed in the Local Hazard Mitigation Plan into the municipal plan, zoning regulations and flood hazard/FEH bylaws will also be considered after declared or local disasters. The Town shall also consider reviewing any future TRORC planning documents for ideas on future mitigation projects and hazard areas.

## V. Community Vulnerability by Hazard

### A. Hazard Identification

Mitigation efforts must be grounded in the rational evaluation of hazards to the area and the risks these hazards pose. This is done through a process, which in essence asks and answers three basic questions:

- What bad things can happen?
- How likely are they to occur?
- How bad could they be?

This process, which is laid out in the table below, is an attempt to inventory the known hazards, establish the likelihood of them occurring in the future, and then assess the community's potential vulnerability to each. In performing this analysis, we are then able to prioritize actions that are designed to mitigate the effects of each of these disaster types and ultimately make Woodstock a safer place.

It is important that we learn from the past in order to avoid the same disasters and their outcomes. Disasters that have occurred within the Town and Village of Woodstock, the larger region, and the State of Vermont can give us good information about what types of disasters we can expect in the future and what kinds of damage they might cause. However, while this historical data can inform our perspective of what might happen in the future, it is by no means a prophecy. While Woodstock might not have been impacted by a specific hazard in the past, this does not necessarily mean it will never be affected in the future. Indeed, the advance of climate change means that old weather patterns may not hold. For instance, in recent years, Vermonters have seen an increase in the number and severity of storms, especially rainfall events. Armed with historical data and a healthy respect for climate change and the unknown, we have tried our best to identify hazards and prepare for the future.

The following table reflects the hazards that we believe can be expected, or are at least possible, in the central Vermont area. We have considered factors such as frequency of occurrence, warning time and potential community impact to rank each and determine which hazards pose the greatest threats to life and property in Woodstock Town and Village.<sup>1</sup> The worst threats (bolded in the table, below) are then followed-up with discussion and mitigation strategies throughout the rest of this Plan.<sup>2</sup> It should be noted that hazards assigned with the same "Hazard Score" are not in order and their placement in the table should not be assumed to reflect their potential to create hazards for the town.

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<sup>1</sup> The ranking methodology used in this Plan (see Appendix A) is closely modeled on that which is used by the Vermont Division of Emergency Management & Homeland Security (VDEMHS). The only changes made were intended to reflect the more limited geographical scope of this analysis, which is focused on a small, rural town rather than the entire State of Vermont (which is the focus of VDEMHS).

<sup>2</sup> It's important to note that those hazards which were not found to pose the greatest threats may still occur in Woodstock's future; however, they are not the focus of this Plan.

Hazard	Frequency of Occurrence	Warning Time	Potential Impact	Hazard Score
<b>Hazardous Material Spill</b>	<b>Highly Likely</b>	<b>None – Minimal</b>	<b>Major</b>	<b>12</b>
<b>Structure Fire</b>	<b>Highly Likely</b>	<b>None – Minimal</b>	<b>Minor</b>	<b>10</b>
<b>Water Supply Contamination</b>	<b>Occasionally</b>	<b>None – Minimal</b>	<b>Major</b>	<b>10</b>
<b>Wildfire</b>	<b>Highly Likely</b>	<b>None – Minimal</b>	<b>Negligible</b>	<b>9</b>
Landslides/Mudslides/Rockslides	Likely	None – Minimal	Negligible	8
<b>Flash Flood/Flood/Fluvial Erosion</b>	<b>Highly Likely</b>	<b>More than 12 Hrs.</b>	<b>Minor</b>	<b>7</b>
Severe Weather (Thunderstorm, Lightning, High Wind, Hail, and Flooding)  *Note: We have defined “Severe Weather” to include two or more of the above hazards.	Highly Likely	More than 12 Hrs.	Minor – Moderate	7.5
Extreme Cold/Snow/Ice Storm	Highly Likely	More than 12 Hrs.	Minor	7
Hurricanes/Tropical Storms	Occasionally	More than 12 Hrs.	Major	7
Hail Storms	Highly Likely	6 – 12 Hrs.	Negligible	7
Dam Failure	Occasionally	None – Minimal	Negligible	7
Earthquake	Occasionally	None – Minimal	Negligible	7
Ice Jams	Highly Likely	More than 12 Hrs.	Negligible	6
Extreme Heat	Highly Likely	More than 12 Hrs.	Negligible	6
Invasive Species/Infestation	Highly Likely	More than 12 Hrs.	Negligible	6
Drought	Unlikely	More than 12 Hrs.	Negligible	3
Tornado	Unlikely	More than 12 Hrs.	Negligible	3

The Woodstock HMP Committee discussed the results of the hazard ranking activity and decided to focus on hazards that had the potential to impact the Town on a town-wide scale and/or had the potential to occur frequently. The hazards that the Committee decided to focus on are bolded in the table above. While flooding events may occur with more warning than landslides, mudslides, or rockslides in Woodstock, the prospect of worse damage caused by flooding and its greater frequency of occurrence is of greater concern to the Town and Village.

After engaging in discussions using their best available knowledge, the Town and Village of Woodstock identified the following “top hazards” that they believe their community is most vulnerable to:

- Hazardous Material Spill
- Structure Fire
- Water Supply Contamination
- Wildfire
- Flash Flood/Flood/Fluvial Erosion

Because the Village is served by a public water system and those properties not connected to the public water system use private wells, the Village is more vulnerable to water supply contamination impacting a larger portion of the population. However, it is recognized that private wells are still vulnerable to contamination, just not on the same scale as the public water system. Due to the forested nature of the Town of Woodstock, it is more vulnerable to wildfire than the Village of Woodstock. However, the Village (especially the outskirts) is still vulnerable to wildfire. The Town and Village of Woodstock are both similarly vulnerable to the hazards of flash food/flood/fluvial erosion, hazardous material spills and structure fires.

In relation to hazards faced by the Town of Woodstock, unless specifically noted, these hazards face all areas of the Town, including the incorporated Village of Woodstock, to some degree. Where differences exist, they are noted. The term “Woodstock” or “Town of Woodstock” should be taken to mean the entire town area including the incorporated village.

Each of these “top hazards” will be discussed in the following sections. Within each section, previous occurrences of each hazard will be listed, including the County-wide FEMA Disaster Declarations (DR-#), where applicable. Hazards information was gathered from local sources (ex., town history book or local records), the National Climatic Data Center’s (NCDC’s) Storm Events Database (1950-2012 and 2006-2012), the Spatial Hazard Events and Losses Database for the United States (SHELDUS) 1960-2012, and Special Reports produced by the National Weather Service in Burlington, Vermont. This section also includes a description of each “top hazard” and a hazard matrix that will also include the following information (please see each hazard profile for a hazard-specific matrix):

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/Probability
Type of hazard.	General areas in community that may be vulnerable to the hazard.	Community structures affected by hazard.	General details of the most notable event(s).	Dollar value or percentage of damages.	<u>Occasionally:</u> 1–10% probability of occurrence per year, or at least one chance in next 100 years <u>Likely:</u> >10% but <100% probability per year, at least 1 chance in next 10 years <u>Highly Likely:</u> 100% probable in a year

## B. Hazard Profiles for “Top Hazards”

### 1. Hazardous Material Spill

Based on available VT Tier II data, there is one site in town that has sufficient types and/or quantities of hazardous materials to require reporting. Woodstock is predominantly located along Routes 4, 12 and 106, running parallel to the Ottauquechee River, Kedron Brook, and Pomfret Brook. No major, functioning interstate highways or railways run through or near the Town. There are a total of 53

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Hazardous Materials Spill**.

Tier II Critical Facilities in the Town, including eleven hazardous material storage facilities. There are 1,051 residential and 260 commercial, industrial or public buildings within 1,000 feet of a potential HAZMAT spill on major roads, such as Routes 4, 12, and 106. This includes the Town Office, the fire department, the Woodstock Union High School, and the police department. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$22,569,620, using figures from the Vermont Department of Taxes. It should also be noted that the State of Vermont currently has only one fully-trained HAZMAT response team, with vehicles located in Essex Junction, Brandon, and Windsor. The HAZMAT crew chief is available within minutes of a call for the team, but on-scene response would be a matter of hours. In the event of a serious accident in Town, there would be little time for evacuation and response would be difficult.

The following data was retrieved from the Vermont Department of Environmental Conservation’s Spill List and by searching the archives of local newspapers. The table above is used to illustrate the ease with which trucks, trains and the day-to-day activities in the Town have the potential to create a hazardous material spill and dangerous conditions for emergency responders and town residents.

#### History of Occurrences:

Date	Event	Location	Extent
02/04/2014	Fuel Oil Leak	Woodstock Inn	AST leaked 50-100 gallons while a transfer was being made from UST to emergency AST. AST was overfilled and fuel went into old fill pipe, which was compromised and came into basement sump.
08/31/2011	Fuel Oil Leak	Cross Street	2-275 gallon heating oil ASTs leaked into property’s basement after it flooded during TS Irene. Silt had to be excavated and debris removed.
08/31/2011	Oil Spill	Golf Ave	A 275 gallon AST spilled and basement flooded at private residence during TS Irene. Oil absorbed
02/10/2010	Unspecified Spill	Woodstock Inn	AST system released 200 gallons of a hazardous substance on the side of the building. Led to soil excavation and installation of interceptor trench and monitoring wells.
10/31/2009	Transformer Oil Spill	Church Hill Road	A tree hit a power pole/transformer, spilling 15 gallons. FD responded, and 2 firefighters and police officers got sprayed, while also dodging a live wire. Determined spill substance was non-PCB. 5 drums were removed.
03/30/2009	Oil Overflow	Private property, Prospect Hill	A burner motor seal problem caused 10 gallons of oil to flow from furnace to flow into floor drain in basement.
04/01/2008	Kerosene Leak	River Bend Way	Vapors were noticed when residents were operating their dryer, found to be emanating for a 200 gallon kerosene leak. Tank was removed, soil excavated.

Date	Event	Location	Extent
02/16/2007	Gasoline Spill	Maplefields, Pleasant Street	A cracked valve led to a 15 gallon gasoline leak.
01/23/2007	Gasoline Spill	Maplefields, Pleasant Street	A vehicle went over an embankment, and its fuel line was severed while it was being towed. 15 gallons of gasoline was released into snow and soil.
03/09/2000	Gasoline Spill	Johnson & Dix Bulk Facility	A 1" diameter bung hole plug failure in an AST caused a 2,589 gallon gasoline spill. The product was released into a containment area, but quickly seeped into the porous backfill material. Gasoline was eventually found on the water table. Contaminated soil was stockpiled.
12/10/1999	Diesel Spill	Grand Union (Rt. 4)	A drum tipped over at the site, causing a 20 gallon diesel spill.
02/11/1999	Gasoline Spill	Johnson & Dix Bulk Supply	A truck struck a loading rack and ripped open a compartment, leading to a 130 gallon spill.
12/17/1998	Gasoline Spill	Maplefields (Pleasant St.)	A vehicle's gas tank overfilled, causing a 30 gallon spill. FD spread speedi-dri and contained the spill until cleanup crews arrived.
11/27/1998	Unspecified Spill	Kedron Valley Inn (Rt. 106)	An UST leaked into a nearby brook, releasing 270 gallons. River was boomed, and tank removed.
09/06/1996	Unspecified Spill	Blake Hill Townhouse	Leak at fitting, causing 50 gallon spill. Contaminated soil was removed and stockpiled.
06/28/1996	Kerosene Leak	Church Hill Trailer Park	An above ground storage tank leaked 100 gallons of kerosene at a private residence.
10/08/1991	Gasoline Spill	Johnson & Dix Bulk Facility	20 gallons of gasoline spilled during a transfer.
04/05/1988	Fuel Oil Spill	Unspecified Location	110 gallons of fuel oil was spilled.
09/18/1984	Unspecified Substance	Route 4	A truck fire led to a 100 gallon spill of an unspecified substance (gasoline or diesel, perhaps) on Rt. 4.
12/28/1982	Gasoline Spill	Unspecified Location	100 gallons of gasoline were spilled, likely from a car leaking gas outside. Created fumes in basement.
11/20/1981	Unspecified Spill	Unspecified Location	500 gallons of a hazardous material were dumped.
10/16/1981	Unspecified Spill	Private Residence	A tank failure led to a 150 gallon spill, possibly of propane or oil.
03/17/1979	Oil Spill	Gerrish Motors	A break in an oil line caused a 100 gallon spill.
11/22/1978	Unspecified Spill	Private Residence	50 gallons of an unspecified substance (likely oil?) spilled after a tank failed.
06/13/1978	Oil Spill	Riding Stables	200 gallons of oil used to suppress dust on roads spilled, and washed into nearby brook during rains.
05/07/1976	Kerosene Spill	McGee Fuel	566 gallons of kerosene spilled.
07/13/1973	Kerosene Spill	Roy Oil Tank Farm	100 gallons of gasoline spilled following the 1973 Flood.

While fewer than half of the spills recorded in Woodstock have consisted of hundreds of gallons of hazardous materials, the potential for a major spill exists. Routes 4 and 12 pose constant threats to the Town and Village of Woodstock due to the volume of traffic they see, particularly during prime tourist seasons. These routes serve as the main thoroughfares for trucks and other motor vehicles transporting a wide-range of goods, including a wide-range of hazardous materials, within the confines of Woodstock. A truck accident and a resulting hazardous material spill could be exceedingly disastrous for

the Town and its residents. The majority of Routes 4 and 12 in the Town and Village of Woodstock are built very close to the Woodstock's rivers and streams, namely the Ottauquechee River and Kedron and Pomfret Brooks, which could create additional water contamination problems if a hazardous material spill were to occur on either of these major routes.

In order to prepare for hazardous material spills in Woodstock, 30 members of the Woodstock Fire Department are trained to the HAZMAT Awareness level.

Hazard	Location	Vulnerability	Extent	Impact	Likelihood/Probability
Hazardous Materials Spill	Town and Village. Routes 4, 12, and 106 running along the Ottauquechee River and Kedron and Pomfret Brooks.	Village of Woodstock, road infrastructure, nearby structures (ex. Town Office or fire department if fuel tank struck), Ottauquechee River, Kedron Brook, Pomfret Brook, and other streams.	Initially, local impacts only; but depending on material spilled, extent of damage may spread (ex. into groundwater)	Within 1,000 feet of Routes 4, 12, 106 and other Class 2 roads, there are 1,051 residential and 260 commercial, industrial or public buildings. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$22,569,620.	Highly Likely

## 2. Structure Fire

Vermont has one of the highest per capita death rates from fire in the nation. This is, in fact, the deadliest form of disaster throughout the state. In 2012, there were 2,225 reported structural fires in the state, which included 6 fatalities and \$17.8 million dollars in damage. Although there have been requirements for smoke detectors in rental housing for over 20 years, and requirements for smoke detectors in single-family dwellings since 1994, there was only one building involved in the fatal fires in 2000 that had evidence of working smoke alarms.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Structure Fire**.

Structure fires may occur at any point, and are typically initiated within a single fuel object. Smoke produced by the burning object forms a smoke plume and rises, creating a layer of smoke while also transporting heat to the smoke layer. Fire then spreads quickly by radiation from the flames, or from the smoke layer. Once other objects are engulfed, more smoke plumes are formed and heat radiates to other objects. Fire burns and moves across different materials depending on the material's composition, orientation, surface-to-mass ratio, and air supply in the structure/room.

The majority of the Village of Woodstock's growth sprawls out from development along the main roadways that cut through the heart of the town and village along Routes 4 and 12. The Village is typified by a large array of old wooden and stone municipal buildings, historic private residences, brick

commercial blocks, and commercial businesses. While both the Town and Village are vulnerable to structure fires, a fire in the Village has the potential to spread, especially in the commercial portion of the Village along Route 4, due to the close proximity of the buildings.

A review of the fires listed in the “History of Occurrences” chart below demonstrates the potential for structures located in the rural Town of Woodstock to be completely or severely destroyed by fire. The following occurrences were reported by the Committee or obtained from local sources. It is reasonable to assume that more structural fires have occurred in the period of time between the entries listed below, and that such fires have caused varying extents of property damage.

**History of Occurrences:**

Date	Event	Location	Extent
04/28/2012	House Fire	Cox District Road, Town of Woodstock	Single-story home and garage in West Woodstock were completely destroyed, killing residents’ two dogs, while the family was watching the Bridgewater raft race. FD was supported by S. Woodstock, Bridgewater, Barnard, North Pomfret, Teago, and Hartford FD’s. Fire possibly started because of a new woodstove. A house burned down on nearly the same spot around 1970 under similar circumstances.
02/03/2012	Farm Fire	Bassett Farm, Rt. 12, Town of Woodstock	Fast moving fire destroyed an antique dairy farm complex. Crews from eight departments spent more than two hours battling the blaze.
1960s	Block Fire	Gillingham’s Block, Village of Woodstock	A fire took place in the commercial block containing Gillingham’s and the butcher shop.
~100 yrs. ago	Block Fire	Bentley’s Block, Village of Woodstock	A large fire took place in the commercial block containing Bentley’s.

Of the calls that were received by Woodstock Fire & Rescue in 2013, none resulted in a great amount of property loss. Nine calls were for building fires, six were for chimney fires, and eleven were called in for brush or grass fires. Off all 126 fires noted in the State of Vermont Fire Statistics for 2013, none of the fires that occurred (all of which were caused by humans) resulted in burned acreage in Woodstock.

There are a number of recognized fire protection problems for the community, including the following: development in areas distant from the center of the Town, development on class 3 and 4 roads, distance from water sources in the Town of Woodstock (rivers, hydrants and/or fire ponds), inaccessibility to fires that may spread from the forest, and inadequate snow removal (for building access). Approximately 10 to 15 years ago, Woodstock had a dry hydrant program, during which many dry hydrants were installed in strategic locations throughout the Town and Village. No additional dry hydrants have been installed within the past 5 years. There are additional areas that could potentially be utilized to this end, and a comprehensive survey may prove an effective means of determining this if more sites are needed. At present, though, the Town has enough hydrants in place to meet its needs.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/Probability
Structure Fire	Town and Village of Woodstock	All housing, municipal buildings, retail/commercial sites.	Depends on the location and extent of the fire.	Varies depending on the location and extent of the fire.	Highly Likely

### 3. Water Supply Contamination

The majority of town and individuals in Vermont use groundwater as their primary source of water.

While groundwater is more protected from contamination than surface water and is generally of a high quality, groundwater is still at risk of contamination from a number of point and non-point sources. Sources of surface contamination located directly above the aquifer may leach through the soil and into the groundwater, or groundwater contamination from another distant source may migrate, and consequently, contaminate a town or individual's water supply.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Water Supply Contamination**.

The migration of contaminants is made more complex because the patterns of groundwater movement, and their relationship to surface water movement, are not completely understood. This creates the potential for groundwater supplies to become contaminated from discrete and unknown sources. It is important to protect groundwater supplies from contamination to the greatest extent possible, because, once contaminated, it is difficult and expensive to clean them to the point where they are again suitable for drinking water.

The following data was retrieved from the Vermont Department of Environmental Conservation's Spill List. It includes some data copied from the Hazard Materials Spill section of this Plan discussed later because the spilling of any hazardous materials also has the potential to contaminate the water supply for the Town of Woodstock.

#### History of Occurrences:

Date	Event	Location	Extent
09/07/2011	Water Main Break	Ottawaquechee River	A water main running under the Ottawaquechee River washed away in the wake of TS Irene, requiring a new hose to be installed to carry the supply to residents over the river along the Elm Street Bridge. The sewer lines were also washed out. This incident in particular was extremely problematic for residents town-wide. A boil notice was initiated as a result of this incident.
04/15/2010	Diesel Spill	Woodstock Waste Water Plant	AST was being filled for a generator. Person responsible for overseeing the plant was distracted, and fuel subsequently went out vent and sprayed the building and ground.
03/08/2002	Unspecified Spill	Woodstock Inn	Sheen noticed on brook, likely a spill flushed down by rain.
11/27/1998	Unspecified Spill	Kedron Valley Inn	An UST leaked into a nearby brook, releasing 270 gallons. River was boomed, and tank removed.
01/25/1997	Unspecified Spill	Woodstock Waste Water Plant	Release from an unknown source.

Date	Event	Location	Extent
10/24/1991	Petroleum Spill	Thompson's Garage, Rt. 12	Petroleum taste detected in water supply, with Thompson's Garage as a possible contamination source. This was a private water supply.
05/15/1985	Unspecified HAZMAT	Ottawaquechee River	80 gallons (or other measurement) of a hazardous material was dumped into the Ottawaquechee River
04/2/1985	Diesel Spill	Ottawaquechee River	An unspecified amount of diesel was discharged into the Ottawaquechee River.
06/13/1978	Oil Spill	Riding Stables	200 gallons of oil used to suppress dust on roads spilled, and washed into nearby brook during rains.

The Village of Woodstock has a closed water system that is run by a private water company, the Woodstock Aqueduct Company, which was founded in 1886. The main wells are located along Route 12N, and are connected to pipes that are then connected to residents. As a consequence, if a break happens in a pipe anywhere along the line, there is a contamination threat. Unlike a number of other towns in the region, Woodstock does not take water from the river or other local waterbodies.

When a water supply contamination issues occurs in Woodstock, it can be catastrophic in instances that require the water supply be shut off when an event like a well collapse occurs, for example. If water service is not completely cut off for the town, residents retain water access to running water but may be forced to boil water to make it potable. Following Tropical Storm Irene, many municipalities were put under a boil water notice, affecting a total of 16,590 people in Vermont. Woodstock was one of a number of towns with large public water systems that was affected by Boil Water Notices, according to the Vermont Agency of Natural Resources.

The Wellhead Protection Plan enumerates potential sources of contamination for the Town's water supply, denotes actions that have been taken to minimize the risk of groundwater contamination, and creates a Source Protection Area. This Area operates similar to a zoning district overlay, and prohibits certain activities that may contaminate the wellhead area, such as using herbicides. Property owners located in the vicinity of Woodstock Aqueduct Company wells are informed of that fact, and offered assistance in the ways they can help minimize contamination into the groundwater supply. The list of hazardous materials spills, particularly on or near Routes 4, 12 and 106 demonstrates the threat of contamination facing the Town's municipal supplies from the Ottawaquechee River.

Private well contamination also threatens those residents and business owners who are not located in the Village of Woodstock, and maintain their own well for drinking water. As private wells are not required to develop a Wellhead Protection Plan or Source Protection Area, the activities nearby a property owner's well are not necessarily regulated. While an individual property owner may only be affected by his or her well being contaminated by a small contamination source, a hazardous material spill may impact multiple wells. The list of hazardous material spills in the Town and Village of Woodstock demonstrates the ease with which private wells could be contaminated, even with a few gallons of hazardous material.

It is important to note that groundwater supplies can also become contaminated by bacteria from a number of sources. These sources may include: a poorly designed leach field, a ruptured septic tank, or over-application or improper storage of manure or fertilizer.

Hazard	Location	Vulnerability	Extent	Anticipated/Potential Impact	Likelihood/Probability
Water Supply Contamination	Woodstock Village, private homes and businesses located throughout the Town.	Approximately 672 connections to the Woodstock Aqueduct Company system. Impacts could also travel to residents not connected to the public water system.	Depends on the amount of and location of the source of contamination —may impact one individual's well or the public water supply.	For individual homeowners who experience a heating oil spill, and the groundwater becomes contaminated: \$90,000 (according to the Massachusetts Dept. of Environmental Protection). For the public water supply, it would depend on the type and extent of contamination. (To clean a very small water system of MTBE (a gasoline additive) over a 10 year period, costs are estimated at \$500,000-\$1,000,000.) A new supply may also be sought (\$3/1000 gallons in small system and community wants a 65,000 gallon capacity) = \$195,000. The costs of medical treatment are not factored in here, but could be substantial.	Occasionally

#### 4. Wildfire

Wildfire may be sparked by natural or human activities. Lightning is one of two main natural causes of wildfire. However, across the United States, approximately 90 percent of wildfires are started by humans. According to FEMA, there are three types of wildfire that can consume natural landscapes and man-made structures and features: surface fire, ground fire and crown fire. Surface fires are slow moving across the forest floor, and, as a result, kill and damage trees. Ground fires are usually caused by lightning strikes, and burn on or below the forest floor. Crown fires, so called for their location in the crown of trees, effortlessly spread through tree tops, often aided by wind.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Wildfire**.

The Vermont landscape is especially vulnerable to wildfire during the period of time in early spring when all the snow has melted, vegetation has not begun to develop leaves, and the land and vegetation are very dry and/or dead. Seventy-eight percent of the Town of Woodstock is forested land, and, of this, a portion is part of the federally-owned and controlled Marsh Billings National Park. A total of 645 acres of federal land in the Town is forested. Owing to the fact that the large portion of the Town is forestland, the Town is vulnerable to the impacts of wildfires, were they to occur within Town bounds.

The following instances of wildfire were reported by the Committee. Their reports were supported with research of news stories, where possible (indicated with an asterisk\*).

#### History of Occurrences:

Date	Event	Location	Extent
5/12/2014	Brush fire	Cox District Road, Town of Woodstock	Extent unknown.
04/01/2006	Controlled Burn	Town of Woodstock	Approximately .75 acres burned.
04/17/2005	Fire Caused by Outside Cooker/Stove	Town of Woodstock	Approximately 3 acres burned.
04/16/2005	Fire Caused by Burning Paper	Town of Woodstock	Approximately 1 acre burned.
04/19/2004	Brush and Trash Fire	Town of Woodstock	Approximately 31 acres burned.
06/13/1984	Burning Brush	Town of Woodstock	Approximately 2 acres burned.
05/09/1981	Fire Started by a Firecracker	Town of Woodstock	Approximately 7.2 acres burned.
04/11/1929	Unknown	Town of Woodstock	Approximately 10 acres were burned.

The Town of Woodstock typically experiences around two to three small brushfires per year; however, there can be as many as five to ten, affecting multiple property owners. The potential exists for brushfires to get out of hand rapidly, particularly in areas where there is a 15% slope or greater (generally included in Woodstock's forestry zone) that impedes firefighting efforts. According to the Committee, areas that are particularly vulnerable to wildfire are Biscuit Hill, Long Hill area, and Curtis Hollow. The Village, especially on the Town/Village interface that may be more forested, is also vulnerable to wildfire.

Approximately 10 to 15 years ago, Woodstock had a dry hydrant program, during which many dry hydrants were installed in strategic locations throughout the Town and Village. However, no additional dry hydrants have been installed within the past 5 years.

Forest areas exist where ground-based firefighting efforts would be very difficult, due to their remoteness or steep slopes. This creates the potential for wildfire to impact private land and property and any logging operations occurring at the time of the wildfire. A wildfire would likely impact or result in the damage of wildlife habitat and recreational lands used for hunting, hiking, mountain biking, and ATV and snowmobiling trails (maintained by VAST, Vermont Association of Snow Travelers).

Hazard	Location	Vulnerability	Extent	Estimated/ Potential Impact	Likelihood/ Probability
Wildfire	General areas in those having a 15% slope or greater (mostly found in the Town of Woodstock). More specific areas include: Biscuit Hill, Long Hill and Curtis Hollow.	Private property, town buildings, utility infrastructure.	Up to this point, the extent of damage has been minimal but all that is needed are the right conditions to experience a more damaging wildfire, especially because over 90% of the Town is forested.	Unknown—data gap.	Highly Likely

## 5. Flash Flood/Flood/Fluvial Erosion

Flooding is one of the worst threats to Woodstock's residents and infrastructure. Past instances of flooding in Woodstock have included rain and/or snowmelt events that cause flooding in the major rivers' floodplains and intense rainstorms over a small area that cause localized flash-flooding. Both kinds of events can be worsened by the build-up of ice or debris, which can contribute to the failure of important infrastructure (such as culverts, bridges, and dams).

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Flash Flood/Flood/Fluvial Erosion**.

The worst flood disaster to hit the Town and Village of Woodstock, as well as the overarching region and the State of Vermont, occurred on November 3, 1927. This event was caused by nearly 10 inches of heavy rain from the remnants of a tropical storm that fell on frozen ground. Eighty-four Vermonters, including the Lieutenant Governor, were killed. The flooding in the White River valley was particularly violent, with an estimated 120,000 to 140,000 cubic feet/second (cfs) flowing out of the White River at West Hartford, Vermont. Like many towns in the region, the Town of Woodstock received heavy precipitation, seeing roughly 7-8 inches of rainfall over the storm period.

Less than fifty years after the Flood of 1927, during the height of summer in 1973, extensive rains fell on already soaked watersheds, including the Ottauquechee. Woodstock was recorded to have had 6.30" of rainfall over the course of the storm. Residents were evacuated from many homes, and West Woodstock was hit particularly hard when the riverbank was breached by floodwaters. A beaver pond in South Woodstock washed out, causing the Kedron Brook to also rise. Building foundations were damaged, and countless basements and parking lots were flooded (including Woodstock Inn's).

A more recent flooding event that devastated the region and the state was the result of Tropical Storm Irene, which occurred on August 28, 2011. Record flooding was reported across the state and was responsible for several deaths, as well as hundreds of millions of dollars of home, road, and infrastructure damage. Due to the strong winds, 50,000 Vermont residents were initially without power, and many did not have electricity restored to their homes and businesses for over a week. Despite the damage wrought, the flooding caused by Tropical Storm Irene is considered to be the second greatest natural disaster in 20<sup>th</sup> and 21<sup>st</sup> century Vermont, second only to the Flood of 1927.

The Town and Village of Woodstock suffered major damage to property and infrastructure during Tropical Storm Irene, although no lives were lost. It is estimated that Tropical Storm Irene dropped 7-8 inches of rain over the Town of Woodstock in a very short span of time, some of the highest precipitation totals in Windsor County (which averaged 4-7 inches over its land area), rivaling rainfall totals experienced in the Flood of 1927. It is thought that the flooding that occurred as a result of the storm was close to being or was equal to a 500-year flood.

Much of Woodstock's road infrastructure was damaged by the storm, including parts of: U.S. Route 4, River Street, Vermont Route 12, Cox District Road, Roberts Road, Happy Valley Road, and the Taftsville Bridge. The county-wide damage for Windsor County totaled over \$32.5 million. More recently in July 2014, flash flooding in Woodstock damaged about 25 roads and caused approximately \$100,000 in

damage. In addition, a section of Cox District Road was damaged and a portion of Spruce Way, an intersection road, was washed out due to a plugged culvert on Cox District Road twice in one week, once on July 25, 2014 (estimated \$10,000 in damaged) and again July 28, 2014 (estimated \$7,500 in damage). The same culvert area was also heavily damaged during Tropical Storm Irene. It replaced with an in-kind culvert with FEMA's Public Assistance funding and cost just under \$69,000.

The following list indicates the history of occurrence with regard to this hazard in Windsor County (given the small population of Woodstock, town-specific data is limited); an asterisk "\*" denotes the few instances in which town-specific data is available, and federal disaster numbers are listed where appropriate.

#### History of Occurrences:

Date	Event	Location	Extent
07/03/2014*	Flash Flooding	Woodstock	Approximately 1.5" of rain and gusts of up to 65 mph. About 25 roads damaged, which may cost around \$100,000 to repair (yet to be determined). Damaged roads included: Long Hill Road, Morgan Hill Road, Brown Hill Road and Fletcher Hill.
06/25/2013-07/11/2013 (DR-4140)	Severe Storms & Flooding	Windsor County	Severe storms over this period caused flooding in places, property damage, intermittent power losses, etc.
08/28/2011-08/29/2011 (DR-4022)*	Flood, TS Irene	Woodstock, Windsor County	Tropical Storm Irene brought winds in excess of 60 mph in places and heavy rains to the state, causing significant flooding in places. Homes, businesses and roads were flooded throughout Windsor County along the Ottauquechee River. Woodstock was recorded as having as much as 7.34" of rainfall over the course of the storm. A total of \$32.5m in damage was reported for Windsor County. \$4,814,278.81 for Woodstock from FEMA's Public Assistance database (captures at least 70% of total damage).
04/27/2011	Flood	Windsor County	High temperatures, snowmelt and rainfall combined to produce significant flooding in places throughout the region.
07/21/2008-08/12/2008 (DR-1790)	Severe Storms & Flooding	Windsor County	Severe storms and flooding hit Windsor County and other parts of Vermont, leaving damage in their wake. Storms on 8/6 caused over \$100k in damage alone in Windsor County.
07/09/2007-07/11/2007 (DR-1715)	Severe Storms & Flooding	Windsor County	Severe storms and flooding struck a number of counties in Vermont, including Windsor.
04/15/2007-04/21/2007 (DR-1698)	Severe Storms & Flooding	Windsor County	Severe storms and flooding hit Windsor and other counties throughout Vermont.
05/14/2006*	Flood	Woodstock, Windsor County	Strong storms brought 3.68" of rainfall to Woodstock, causing flooding and minor washouts on several roads. The Ottauquechee River experienced bankfull conditions and minor field flooding occurred. \$25k in damages reported throughout the county.
10/07/2005-10/09/2005	Heavy Rain	Windsor County	Heavy rains reached over 6" in portions of Windsor County, causing flooding, mudslides, and clogged culverts in places.
07/21/2003-08/18/2003 (DR-1488)	Severe Storms & Flooding	Windsor County	Severe storms and flooding hit Windsor County and other portions of the state, causing damage.
04/13/2002-04/14/2002	Flood	Windsor County	A combination of snowmelt and rainfall of 1-3" across the area caused flooding in areas. \$50k in damage reported throughout the county.
12/17/2000-12/18/2000	Flash Flood	Windsor County	Small streams overflowed their banks, causing some road and low-land flooding. \$5k in damage reported throughout Windsor County.

Date	Event	Location	Extent
07/31/2000	Flash Flood	Windsor County	A strong storm brought heavy rainfall to the region, causing many smaller rivers to reach or exceed bankfull conditions. \$10k in damage reported in Windsor County.
07/14/2000-07/18/2000 (DR-1336)	Flash Flood	Windsor County	Strong showers and thunderstorms across the state resulted in especially heavy rainfall. \$500k in reported damage throughout the county
04/04/2000	Flash Flood	Windsor County	Mild temperatures and steady rains resulted in melting mountain snows, which led to many rivers and streams rising up bankfull or above and some flooding in areas. \$5k in damage reported in Windsor County.
03/28/2000	Flash Flood	Windsor County	Steady rain and melting snow resulted in rising water levels on country rivers and streams. \$5k in damage reported in the county.
09/16/1999-09/21/1999 (DR-1307)	Tropical Storm	Windsor County	Tropical Storm Floyd brought heaving rains, high winds, and flooding to many counties in Vermont, including Windsor.
06/27/1997	Flash Flood	Windsor County	Heavy rains brought 3 to 6 inches of rainfall to northern portions of Windsor County, causing extensive flood damage. \$1m in damages were reported throughout the county.
07/06/1973 (DR-397)*	Severe Storms, Flooding, Landslides	Woodstock, Windsor County	Extensive rains fell on already soaked watersheds, including the Ottauquechee. Woodstock was recorded to have had 6.30" of rainfall over the course of the storm, forcing evacuations. Rivers and streams throughout the town reached or breached bankfull conditions, causing widespread damage.
11/03/1927-11/04/1927*	Flood	Woodstock, Windsor County	The greatest recorded flood disaster in Vermont history devastated the state, losing countless homes, 1,285 bridges, hundreds of miles of roadways and railway tracks, and taking a total of 84 lives, including then-Lt. Gov. S. Hollister Jackson. Rain totals over the 3rd and 4th reached 7.38" in Woodstock.

Woodstock has flood hazard regulations that are integrated into its Zoning Bylaws. The Town and Village's Flood Hazard District is zoning overlay district protects a special flood hazard area designated on the Federal Insurance Administration's Flood Insurance Rate Maps. The purpose of this specifically designated overlay district is meant to "lessen or avoid the hazards or damage to property" that may result from flooding along the banks of the Ottauquechee River and its tributaries. All development in the floodway areas is prohibited. Development standards for properties in floodway fringe areas (which includes special flood hazard areas that are outside of the floodway) must strictly conform to criteria outlined in the zoning bylaws that ensure existing and new structures are constructed to withstand the impacts of flood events.

There are 182 residential (106 single family dwellings, 35 multi-family dwellings, 34 mobile homes, and 7 other residential homes) and 66 commercial/industrial/public structures in the 500-year floodplain, which would total \$85,429,052 if all properties were damaged/destroyed in a severe flooding event. There are four public water supply wells, two wastewater treatment plants, five hazardous materials storage facilities, and a fire station located in the floodplain, which are all classed as critical facilities for the Town. The flooding that occurred as a result of Tropical Storm Irene is considered to be greater than a 100-year flood event, and possibly closer to a 500-year flood. As a result, it is important to restore floodplain, improve areas and/or increase the number of areas for retention of floodwaters to reduce the risk to structures and critical and road infrastructure wherever possible, in addition to employing other mitigation measures.

Across Vermont, most child and elder care facilities are not registered with the State. Most child day care is private in-home care in Woodstock, but there are also four licensed facilities. Currently, there is one assisted living facility in Woodstock (Woodstock Terrace), one residential care facility (Homestead), and a further long-term nursing care facility (Mertens House) in Woodstock. Finally, low income housing is not registered with the State, but there is currently one mobile home park located in Woodstock that is registered with the state (Riverside Mobile Home Park) and was damaged during Tropical Storm Irene.

Recent studies have shown that the majority of flooding in Vermont is occurring along upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. These areas are often not recognized as being flood prone, and property owners in these areas are not typically required to have flood insurance (DHCA, 1998). It should be noted that, while small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Maps), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be extremely erosive, causing damage to road infrastructure and to topographic features including stream beds and the sides of hills and mountains. The presence of undersized or blocked culverts can lead to further erosion and stream bank/mountainside undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently. There are no residential structures, commercial structures, or camp sites located in Woodstock's fluvial erosion hazard zone.

Culvert maintenance is an on-going effort in the Town and Village of Woodstock. Woodstock has historically engaged in completing comprehensive culvert inventories, and completed a comprehensive, geo-referenced culvert inventory in the fall of 2014 funded by a Vermont VTrans Better Backroads grant. As part of the culvert inventory, priority culvert projects for both the Town and Village will be identified, a project overview (including a description, needed materials, and budget) will be complete for each project. The projects will then be reviewed/vetted by the Vermont river engineer covering the Town and Village of Woodstock.

Currently, there are no development projects are planned in Woodstock in areas that would be vulnerable to flooding. There are no repetitive loss properties in either the Village of Woodstock or Town of Woodstock on FEMA's NFIP list.

<b>Hazard</b>	<b>Location</b>	<b>Vulnerability</b>	<b>Extent</b>	<b>Observed Impact</b>	<b>Likelihood/Probability</b>
Flash Flood/ Flood/ Fluvial Erosion	In particular, U.S. Route 4, River Street, and Vermont Route 12. The areas of the Town/Village along the Ottauquechee are vulnerable to inundation flooding. Much of the Town of Woodstock is vulnerable to fluvial erosion due to the topography.	Culverts, bridges, road infrastructure. Between the Town and Village, there are 182 residential (106 single family dwellings, 35 multi-family dwellings, 34 mobile homes, and 7 other residential homes) and 66 commercial/industrial/public structures in the 500-year floodplain.	Tropical Storm Irene- 4-7" across county (as much as 7.34" reported in Woodstock)	From TS Irene: \$4,814,278.81 for Woodstock from FEMA's Public Assistance database (captures at least 70% of total damage).	Highly Likely

## **VI. Mitigation**

### **A. Mitigation Goals**

1. To reduce injury and losses from the hazard of a hazardous material spill.
2. To reduce injury and losses from the hazard of structural fire(s).
3. To reduce injury and losses from the hazard of water supply contamination.
4. To reduce injury and losses from the natural hazard of wildfire(s).
5. To reduce injury and losses from the natural hazard of flash flooding/flooding/fluvial erosion.

### **B. Excerpted Town and Village Master Plan Goals & Objectives Supporting Local Hazard Mitigation**

- Increase fire safety in Woodstock (p.23).
- Provide ample high quality water supplies (p. 24).
- Minimize pollution from wastewater (p. 24).
- Coordinate future construction densities with public sewage treatment capacities (p. 24).
- Educate the public of the need for emergency training (p. 25).
- Consider how new developments (e.g., housing, transportation, infrastructure, policies, zoning, road construction, water treatment plants) impact health (p. 48).
- Maintain and improve groundwater and surface water quality for public and aquatic health and related recreational benefits (p. 80).
- Provide greater safety and reduce hazards and accidents (p. 102).
- Uncontrolled access compromises the safety and efficiency of our public highways. Promote access management to preserve the safety and mobility for the traveling public (p. 103).

The Woodstock Town and Village Master Plan was updated and adopted on 05/20/2014, and has a 5 year lifespan.

### C. Hazard Mitigation Strategies: Programs, Projects & Activities

Vermont's Division of Emergency Management & Homeland Security encourages a collaborative approach to achieving mitigation at the local level through partnerships with Vermont Agency of Natural Resources, VTrans, Vermont Agency of Commerce and Community Development, Regional Planning Commissions, FEMA Region 1 and others. That said, these agencies and organizations can work together to provide assistance and resources to towns interested in pursuing hazard mitigation projects.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3)(ii), 201.6(c)(3)(iii) and 201.6(c)(3)(iv).

With each mitigation strategy, general details about the following are provided: local leadership, possible resources, implementation tools, and prioritization. The prioritization category is based upon the economic impact of the action, the need for Woodstock Town and/or Village to address the issue, the cost of implementing the strategy, and the availability of potential funding. The cost of the strategy was evaluated in relation to its benefit as outlined in the STAPLEE guidelines. A range of mitigation strategies were vetted by the committee, and those that were determined to be feasible (economically, politically, environmentally, etc.) are included in the table below.

Strategies given a "High" prioritization indicate they are either critical or potential funding is readily available, and should have a timeframe of implementation of less than two years. A "Medium" prioritization indicates that a strategy is less critical or the potential funding is not readily available, and has a timeframe for implementation of more than two years but less than four. A "Low" prioritization indicates that the timeframe for implementation of the action, given the action's cost, availability of funding, and the community's need to address the issue, is more than four years.

The Town and Village of Woodstock both understand that, in order to apply for FEMA funding for mitigation projects, a project must meet more formal FEMA benefit cost criteria, and a project seeking FEMA funds would undergo a full benefit-cost assessment in the FEMA-approved format. The Town and Village must both have a FEMA-approved Hazard Mitigation Plan as well.

The following strategies will be incorporated into the Town and Village of Woodstock's long-term land use and development planning documents. In addition, the Town and Village will review and incorporate elements of this Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/ fluvial erosion hazards (FEH) bylaws. The incorporation of the goals and strategies listed in the Local Hazard Mitigation Plan into the master plan, zoning regulations and flood hazard/FEH bylaws will also be considered after declared or local disasters. The Town and Village shall also consider reviewing any future TRORC planning documents for ideas on future mitigation projects and hazard areas. For the purposes of implementing actions, the Village has jurisdiction to do so within the Village boundaries, and yet some actions may require coordination with the Town of Woodstock.

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Addresses Town/ Village?</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources*</b>	<b>Time Frame</b>
All Hazards	<i>Ensure that Woodstock's Town and Village Local Emergency Operations Plan (LEOP) is kept up-to-date and identifies vulnerable areas and references this Plan.</i>	Town and Village	Municipal Manager	High	Local resources; TRORC; Vermont Emergency Management	1 year from date of Plan approval
	<i>Consistently document infrastructure damage after weather events.</i>	Town and Village	Highway Superintendent	High	Local resources; Vermont Emergency Management	Per occurrence
	<i>Set up a VT Alert (provides emergency-related information and alerts) booth at Town Meeting and encourage residents to sign-up.</i>	Town and Village	Municipal Manager	High	Local resources; Vermont Emergency Management; VT Alert	1 year from date of Plan approval
Hazardous Material Spill	<i>Ensure that all emergency response and management personnel continue to receive HAZMAT Awareness training at a minimum.</i>	Town and Village	Fire Department	High	Local resources; Vermont Fire Academy	1 year from date of Plan approval
	<i>Continuously stock gear to help contain small spills when they occur (booms, absorbent materials, etc.).</i>	Town and Village	Fire Department	High	Local resources; Vermont Fire Academy	As needed
	<i>Identify hazardous material storage tanks, and raise awareness on risk factors.</i>	Town and Village	Fire Department	Medium-High	Local resources; Tier II reports	1-2 years from date of Plan approval
	<i>Obtain digital Tier II reports for facilities within the Town and Village of Woodstock.</i>	Town and Village	Fire Department	Medium-High	Local resources; TRORC; Tier II reports; Vermont State HAZMAT Team	1-2 years from date of Plan approval

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Addresses Town/ Village?</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources*</b>	<b>Time Frame</b>
Structure Fire	<i>Ensure that fire department personnel maintain their Firefighter certifications.</i>	Town and Village	Fire Department	High	Local resources (most trainings done in-house)	Annually
	<i>Conduct a public education program on fire prevention and disseminate information.</i>	Town and Village	Fire Department	Medium	Local resources	At least every other year
Structure Fire/ Wildfire	<i>Purchase a UTV to use for wildfires/brushfires and rescues.</i>	Town and Village	Fire Department/ EMS	Medium	Local resources; donations	1-2 years from date of Plan approval
Wildfire	<i>Draft a Community Wildfire Protection Plan (assesses the community wildfire risk, discusses the ability to respond and recommends actions to reduce wildfire risk).</i>	Town and Village	Planning Department/ Planning Commission	Low	Local resources; Vermont Rural Fire Protection Task Force	4-5 years from date of Plan approval
	<i>Develop a program to educate residents on how to safely conduct an outdoor burn upon granting of an individual's first burn permit.</i>	Town and Village	Fire Department	High	Local resources	As needed
	<i>Develop a program to receive training and practice using brushfire/forestry equipment.</i>	Town and Village	Fire Department	High	Local resources	1 year from date of Plan approval

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Addresses Town/ Village?</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources*</b>	<b>Time Frame</b>
Water Supply Contamin- ation	<i>Maintain and update the Town's Wellhead Protection Plan.</i>	Village	Woodstock Aqueduct Company	Medium-High	Woodstock Aqueduct Company; Vermont DEC's Drinking Water and Groundwater Protection Division	3 years from date of Plan approval
	<i>Develop a program to educate landowners adjacent to Woodstock Aqueduct Wells on groundwater supply contamination mitigation practices.</i>	Town and Village	Woodstock Aqueduct Company	High	Woodstock Aqueduct Company; Vermont DEC's Drinking Water and Groundwater Protection Division	1 year from date of Plan approval
	<i>Consider adopting wellhead protection regulations.</i>	Town and Village	Planning Department/ Planning Commission	Low	Local; Woodstock Aqueduct Company	4 years from date of Plan approval
Flash Flood/ Flood/ Fluvial Erosion	<i>Maintain and update town bridge and culvert inventories. Regularly inspect and maintain town bridges and culverts.</i>	Town and Village	Highway Superintendent	High overall; but Low-High depending on "what," "where" and "when" for culvert upgrades/ repairs	Local resources; TRORC; Better Backroads grants;	1-5 years from date of Plan approval
	<i>As part of Town Plan updates, determine if revising and strengthening the Town's flood hazard regulations contained within the Town's Zoning Bylaws is necessary to remain compliant with federal and state laws.</i>	Town and Village	Planning Department	Low-Medium	Local resources; TRORC; Municipal Planning Grants; Vermont DEC's River Management Section	4 years from date of Plan approval

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Addresses Town/ Village?</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources*</b>	<b>Time Frame</b>
Flash Flood/ Flood/ Fluvial Erosion	<i>Adopt fluvial erosion hazard (FEH)/river corridor regulations which will incorporate VT ANR's river corridor maps.</i>	Town and Village	Planning Department	Low-Medium	Local resources; TRORC; Municipal Planning Grants; Vermont DEC's River Management Section	4 years from date of Plan approval
	<i>Upgrade/upsized, repair or clean the culverts listed in the <u>Town's</u> priority list as determined by the Better Backroads culvert inventory. See Appendix D.</i>	Town	Highway Superintendent / Municipal Manager	Low-High, depending on funding and capabilities	Local resources; Better Backroads grants; Vermont DEC's River Management Section; VTrans; Structures grants, TRORC; HMGP/PDM	1-5 years from date of Plan approval
	<i>Replace undersized culvert on Cox District Road (washed out road twice in 2014 alone) with a more hydraulically correct structure.</i>	Town	Highway Superintendent / Municipal Manager	Medium-High	Local resources; TRORC; VTrans; HMGP/PDM	1-3 years from date of Plan approval
	<i>Upgrade/upsized, repair or clean the culverts listed in the <u>Village's</u> priority list as determined by the Better Backroads culvert inventory. See Appendix E.</i>	Village	Village Road Foreman/ Highway Superintendent / Municipal Manager	Low-High, depending on funding and capabilities	Local resources; Better Backroads grants; Vermont DEC's River Management Section; VTrans; Structures grants, TRORC; HMGP/PDM	1-5 years from date of Plan approval

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Addresses Town/ Village?</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources*</b>	<b>Time Frame</b>
Flash Flood/ Flood/ Fluvial Erosion	<i>Develop a culvert replacement policy specifying culvert upsizing requirements, and include it in the Town Highway Ordinance.</i>	Town	Municipal Manager	Medium	Local resources	2-4 years from date of Plan approval
Flash Flood/ Flood/ Fluvial Erosion// Wildfire	<i>Remove, where necessary, trees and brush from rivers/streams that pose an imminent threat to public safety and property.</i>	Town	Highway Superintendent /Municipal Manager	Low-High	Local resources; Vermont DEC's River Management Section	1-5 years, from date of Plan approval (depends on area)

\*Depending on the mitigation action, local resources may include the following: personnel/staff time; volunteer time; budget line items, donations, cash from capital campaigns, among others.

## **Certificate of Adoption**

The Town of Woodstock Select Board  
A Resolution Adopting the  
Multi-Jurisdictional Local Hazard Mitigation Plan  
\_\_\_\_\_, 2015

WHEREAS, the Town of Woodstock has worked with the Two Rivers-Ottawaquechee Regional Commission to identify hazards, analyze past and potential future losses due to natural and manmade-caused disasters, and identify strategies for mitigating future losses; and

WHEREAS, the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan contains several potential projects to mitigate damage from disasters that could occur in the Town of Woodstock; and

WHEREAS, a duly-noticed public meeting was held by the Town of Woodstock Select Board on \_\_\_\_\_, 2015 to formally adopt the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Woodstock Select Board adopts the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan Update.

\_\_\_\_\_  
Chair of Select Board

\_\_\_\_\_  
Member of Select Board

ATTEST

## **Certificate of Adoption**

The Village of Woodstock Village Trustees  
A Resolution Adopting the  
Multi-Jurisdiction Local Hazard Mitigation Plan  
\_\_\_\_\_, 2015

WHEREAS, the Village of Woodstock has worked with the Two Rivers-Ottawaquechee Regional Commission to identify hazards, analyze past and potential future losses due to natural and manmade-caused disasters, and identify strategies for mitigating future losses; and

WHEREAS, the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan contains several potential projects to mitigate damage from disasters that could occur in the Village of Woodstock; and

WHEREAS, a duly-noticed public meeting was held by the Village of Woodstock Trustees on \_\_\_\_\_, 2015 to formally adopt the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Woodstock Village Trustees adopts the Woodstock Multi-Jurisdictional Local Hazard Mitigation Plan Update.

\_\_\_\_\_  
Chair of Village Trustees

\_\_\_\_\_  
Member of Village Trustees

ATTEST

## Appendices

### Appendix A: Hazard Ranking Methodology

<u>Frequency of Occurrence</u> Probability	<u>Warning Time</u> Amount of time generally given to alert people to hazard	<u>Potential Impact</u> Severity and extent of damage and disruption
<p>1 = <i>Unlikely</i>            &lt;1% probability of occurrence in the next 100 years</p> <p>2 = <i>Occasionally</i>            1–10% probability of occurrence per year, or at least one chance in next 100 years</p> <p>3 = <i>Likely</i>            &gt;10% but &lt;100% probability per year, at least 1 chance in next 10 years</p> <p>4 = <i>Highly Likely</i>            100% probable in a year</p>	<p>1 = More than 12 hours</p> <p>2 = 6–12 hours</p> <p>3 = 3–6 hours</p> <p>4 = None—Minimal</p>	<p>1 = <i>Negligible</i>            Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries</p> <p>2 = <i>Minor</i>            Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries</p> <p>3 = <i>Moderate</i>            Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities</p> <p>4 = <i>Major</i>            Severe property damage on a metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities</p>

### Appendix B: Critical Stream Crossings

Critical crossings group one includes stream crossing structures on town highways that cross third order streams or larger. Headwater streams generally include first through third order. Third order was included as these headwater streams will have larger drainage areas and may have larger structures that are more difficult to replace and have a larger impact on the road network. Most of these are bridges.

RDFLNAME	STRUCT_NUM	CATEGORY	AOTCLASS	X_COORD	Y_COORD	STR_TYPE	STR_MAT	CUL_WIDTH	CUL_HEIGHT	CUL_LEN
KAUFMAN ROAD	101424002414241	B	3	-72.578	43.6476	0	7	0	0	0
N BRIDGEWATER RD	101424002314241	B	0	-72.5696	43.6471		0	0	0	0
N BRIDGEWATER RD	101424002214241	B	0	-72.5648	43.6481		0	0	0	0
TUCKER ROAD	101424004914241	B	3	-72.5384	43.6469	2	1	0	0	0
POMFRET RD	200166000214242	B	0	-72.5256	43.6434		0	0	0	0
POMFRET RD	200166000114242	B	0	-72.5255	43.6421		0	0	0	0
OLD RIVER RD	101424003114241	B	0	-72.5139	43.6351		0	0	0	0
CLOUDLAND ROAD	70004402781424X	C	3	-72.5069	43.6439	30	10	16	16	30
CLOUDLAND ROAD	70004403151424X	C	3	-72.5064	43.6424	30	10	18	18	30
COVERED BRIDGE RD	101424004514241	B	0	-72.4679	43.6308		0	0	0	0
BUTTERNUT LN	401424004614241	B	3	-72.4704	43.6313	99	99	0	0	0
HAPPY VALLEY RD	101424004114241	B	0	-72.4707	43.6289		0	0	0	0
CROSS ST	101424007214241	B	0	-72.5174	43.6224		0	0	0	0
HOLLOW FARM RD	401424000814241	B	3	-72.621	43.5684	99	99	0	0	0
LARRY CURTIS RD	101424001014241	B	0	-72.6157	43.5845		0	0	0	0
NOAH WOOD RD	401424004714241	B	3	-72.5569	43.547	99	99	0	0	0
EAST HILL	401424003514241	B	3	-72.5319	43.5546	99	99	0	0	0
MORGAN HILL RD	401424003214241	B	3	-72.5329	43.5576	99	99	0	0	0
DENSMORE HILL ROAD	101424003614241	B	3	-72.5147	43.5813	30	10	0	0	0
DUNHAM HILL RD	101424003714241	B	0	-72.5151	43.5911		0	0	0	0
COX DISTRICT RD	401424002114241	B	3	-72.5775	43.6199	99	99	0	0	0
COX DISTRICT RD	401424002014241	B	3	-72.5759	43.619	99	99	0	0	0
COX DISTRICT RD	401424001914241	B	3	-72.5712	43.6152	99	99	0	0	0
CABOT RD	70001701111424X	C	3	-72.5683	43.6125	30	10	72	60	32
CABOT RD	401424001614241	B	3	-72.5654	43.6061	99	99	0	0	0
BRIDGES ROAD	101424000914241	B	3	-72.589	43.5999	2	10	0	0	0
BRIDGES ROAD	101424002514241	B	3	-72.569	43.6006	7	7	0	0	0

Critical crossings group two includes significantly undersized structures, usually culverts, were identified from the ANR-DEC stream geomorphic assessment survey with openness ratios less than 50%. This measure refers to when structure's width is less than half of the stream bankfull width. Several of these structures may have been damaged during TS Irene or other events and may have been replaced. The town, at some point, should look at these sites and assess their status and need for repair/upgrades.

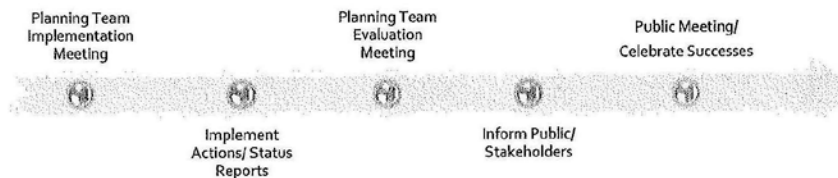
RDFLNAME	GROUP_TWO	CATEGORY	X_COORD	Y_COORD	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	OpennessR	ChannelWid
GULLY RD	Y	C	-72.5442	43.6467	36	36	20	0.26087	7.7
CLOUDLAND ROAD	Y	C	-72.5071	43.6448	48	48	40	0.4	13
PROSPER RD	Y	C	-72.5465	43.6202	48	36	40	0.291667	13
MOSHER MILLS RD	Y	C	-72.5431	43.6165	36	36	18	0.5	18
MILL RD	Y	C	-72.5438	43.6152	48	48	40	0.411111	18
COLLEGE HILL RD	Y	C	-72.5373	43.615	48	48	52	0.307692	8.1
MORGAN HILL RD	Y	C	-72.5326	43.553	48	42	40	0.34	11
HARTLAND HILL RD	Y	C	-72.4847	43.6079	48	48	41	0.370732	12.3
HARTLAND HILL RD	Y	C	-72.5063	43.6264	60	42	52	0.38	11.5
MERTENS RD	Y	C	-72.5844	43.6221	36	36	40	0.25	9.3
RIVERSIDE PARK RD	Y	C	-72.5579	43.5984	24	24	30	0.133333	8.7

## Appendix C: Five Year Review and Maintenance Plan

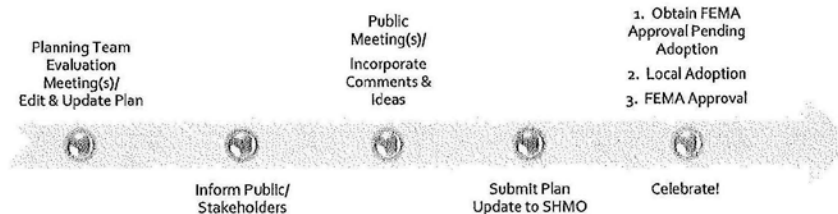
### 5-Year Plan Review/Maintenance



#### *After Plan Adoption-Annually Implement and Evaluate*



#### *Fifth Year, and After Major Disaster Evaluate and Revise*



## Appendix D: Town of Woodstock List of Priority Culverts for Improvement/Repair

Town of Woodstock Poor Culvert Condition Priorities 2014									
Culvert No.	RDFLNAME	STR_TYPE	STR_MAT	CONDITION	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	CONDCOMMNT	TIER
15	CHURCH HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	40	needs to be defined better	High
15	COX DISTRICT RD	ROUND	STEEL CORRUGATED	CRITICAL	48	48	25		High
1	DARLING RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	40	outlet plugged	High
11	DUNHAM HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	18	18	40	outlet plugged, no receiving swale	High
12	DUNHAM HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	25		High
1	GROVE HILL RD	BOX	STONE	POOR	24	24	25	stone header falling in	High
14	HAPPY VALLEY RD	ROUND	STEEL CORRUGATED	Critical	15	15	30	stone header	High
15	HAPPY VALLEY RD	BOX	STONE	Critical	24	12	25	stone header	High
16	HAPPY VALLEY RD	ROUND	PLASTIC CORRUGATED	Critical	12	12	30	stone header	High
17	HAPPY VALLEY RD	ROUND	PVC	Critical	8	8	30	stone header	High
18	HAPPY VALLEY RD	ROUND	PLASTIC CORRUGATED	Critical	15	15	35	stone header	High
19	HAPPY VALLEY RD	ROUND	PLASTIC CORRUGATED	Critical	15	15	40	stone header	High
9	MECAWEE RD	ROUND	STEEL CORRUGATED	POOR	12	12	40	spring only	High
5	BROWN HILL RD	DROP INLET	MIXED	CRITICAL	0	0	0	cannot find incoming pipe or outlet	Med
1	BRIDGES RD	ROUND	STEEL CORRUGATED	POOR	12	12	30	off side of road, rusted out	Med
10	BRIDGES RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	35	inlet mostly clogged 2nd plastic pipe	Med
5	CHURCH HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	40	stone header	Med
21	CHURCH HILL RD	ROUND	PLASTIC CORRUGATED	POOR	15	15	35	no reciving swale	Med
36	CHURCH HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	40		Med
9	CURTIS HOLLOW RD	ROUND	STEEL CORRUGATED	POOR	12	12	35		Med
4	DARLING RD	ROUND	STEEL CORRUGATED	POOR	18	18	20	crushed stone header	Med
3	DENSMORE HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	24	24	40	sediment at inlet	Med
1	FLETCHER HILL RD	ROUND	STEEL CORRUGATED	POOR	8	8	35	plugged	Med
6	FLETCHER HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	15	15	40		Med
25	FLETCHER HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	18	18	70	outlet not found	Med
4	FLETCHER SCHOOLHOUSE RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	30	plugged	Med
6	FLETCHER SCHOOLHOUSE RD	ROUND	STEEL CORRUGATED	POOR	15	15	40		Med
9	FLETCHER SCHOOLHOUSE RD	ROUND	STEEL CORRUGATED	POOR	12	12	30	concrete header	Med
3	HOADLEY RD	ROUND	STEEL CORRUGATED	POOR	12	12	20		Med
3	LARRY CURTIS RD	ROUND	STEEL CORRUGATED	POOR	0	0	0	can't find outlet	Med
36	LONG HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	15	15	27	sediment plugged	Med
10	MECAWEE RD	ROUND	STEEL CORRUGATED	POOR	12	12	40		Med
14	MECAWEE RD	ROUND	STEEL CORRUGATED	POOR	18	18	32	top caving	Med
22	NOAH WOOD RD	ROUND	STEEL CORRUGATED	POOR	12	12	50		Med
4	PETERKIN HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	30		Med
3	RANDALL RD	ROUND	STEEL CORRUGATED	POOR	12	12	28	plugged both sides	Med
2	REEVES RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	20		Med
2	STIMETS RD	ROUND	STEEL CORRUGATED	POOR	12	12	35		Med
2	THE LANE	ROUND	STEEL CORRUGATED	POOR	8	8	20		Med
4	THE LANE	ROUND	STEEL CORRUGATED	POOR	12	12	20		Med
1	TOWN FARM RD	ROUND	PLASTIC CORRUGATED	POOR	15	15	45	sediment outlet	Med
1	VALLEY VIEW RD	DROP INLET	STEEL CORRUGATED	POOR	15	15	25		Med
3	WYMAN LN	ROUND	PLASTIC CORRUGATED	CRITICAL	6	6	35	plugged	Med
40	FLETCHER HILL RD	ROUND	STEEL CORRUGATED	POOR	18	18	30	3/4 plugged	Low
2	BENEDICT RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	25	inlet needs cleaning	Low
1	BISCUIT HOLLOW RD	ROUND	STEEL CORRUGATED	POOR	15	15	22	inlet needs cleaning	Low
3	BISCUIT HOLLOW RD	ROUND	STEEL CORRUGATED	POOR	15	15	35	inlet needs cleaning	Low
1	BROWN HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	18	18	45	inlet plugged	Low
4	BROWN HILL RD	ROUND	PLASTIC SMOOTH	CRITICAL	15	15	45	inlet needs cleaning	Low
5	BRYANT RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	25	inlet plugged	Low
6	BRYANT RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	20	inlet plugged	Low
2	CALENDAR HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	18	18	40	outlet filled	Low
3	CALENDAR HILL RD	ROUND	STEEL CORRUGATED	POOR	15	15	40	inlet plugged	Low
4	CALENDAR HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	15	15	35	inlet plugged	Low
9	CARLTON HILL RD	ROUND	PLASTIC SMOOTH	POOR	4	4	65		Low
17	CARLTON HILL RD	ROUND	STEEL CORRUGATED	POOR	15	15	30		Low

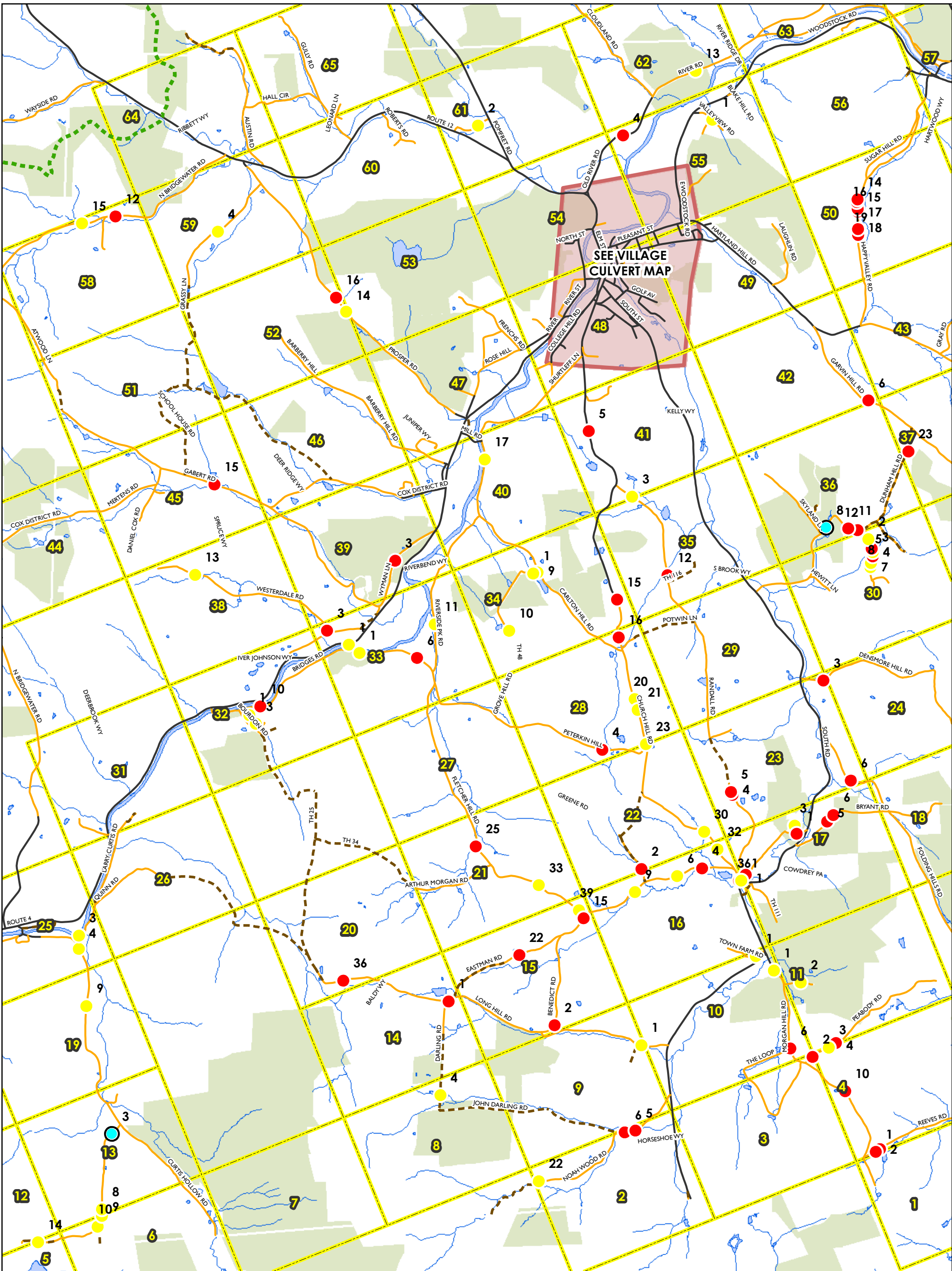
16	CHURCH HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	18	18	40	stone header outlet plugged	Low
20	CHURCH HILL RD	ROUND	STEEL CORRUGATED	POOR	18	18	35		Low
23	CHURCH HILL RD	ROUND	STEEL CORRUGATED	POOR	15	15	30		Low
30	CHURCH HILL RD	ROUND	STEEL CORRUGATED	POOR	15	15	30		Low
32	CHURCH HILL RD	ROUND	STEEL CORRUGATED	POOR	18	18	30		Low
4	CURTIS HOLLOW RD	ROUND	PLASTIC CORRUGATED	POOR	15	15	85		Low
8	DUNHAM HILL RD	ROUND	STEEL CORRUGATED	UNKNOWN	15	15	40		Low
23	DUNHAM HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	35	inlet plugged perched	Low
2	E HILL RD	ROUND	STEEL CORRUGATED	POOR	18	18	40		Low
33	FLETCHER HILL RD	ROUND	PLASTIC CORRUGATED	POOR	18	18	50	half full sediment	Low
15	FLETCHER SCHOOLHOUSE RD	ROUND	STEEL CORRUGATED	CRITICAL	18	18	30	inlet needs cleaning	Low
22	FLETCHER SCHOOLHOUSE RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	40	completely plugged	Low
6	FOLDING HILLS RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	25	inlet needs cleaning	Low
6	GARVIN HILL RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	40	outlet needs cleaning	Low
4	GRASSY LN	ROUND	STEEL CORRUGATED	POOR	12	12	25	needs cleaning	Low
2	GREENE RD	ROUND	PLASTIC CORRUGATED	CRITICAL	15	15	20	inlet plugged	Low
10	GROVE HILL RD	ROUND	PLASTIC CORRUGATED	POOR	15	15	70	stone header sedimentation	Low
1	HOADLEY RD	ROUND	PLASTIC CORRUGATED	CRITICAL	12	12	20	inlet needs cleaning	Low
1	KENDALL RD	ROUND	STEEL CORRUGATED	POOR	15	15	45		Low
1	LONG HILL RD	BOX	STONE	POOR	18	18	30	stone header	Low
3	MECAWEE RD	ROUND	PLASTIC CORRUGATED	UNKNOWN	0	0	0		Low
8	MECAWEE RD	ROUND	PLASTIC CORRUGATED	POOR	24	24	42	curved plugged	Low
1	MORGAN HILL RD	UNKNOWN	UNKNOWN	POOR	0	0	110	drop inlet	Low
7	MORGAN HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	18	18	40	stone header outlet needs cleaning	Low
11	MORGAN HILL RD	ROUND	PLASTIC CORRUGATED	CRITICAL	15	15	40	filled	Low
12	N BRIDGEWATER RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	40	inlet needs cleaning	Low
15	N BRIDGEWATER RD	ROUND	PLASTIC CORRUGATED	POOR	18	18	50	stone header	Low
5	NOAH WOOD RD	ROUND	PLASTIC CORRUGATED	CRITICAL	18	18	40	filled	Low
6	NOAH WOOD RD	ROUND	STEEL CORRUGATED	CRITICAL	15	15	40	filled	Low
4	OLD RIVER RD	UNKNOWN	UNKNOWN	CRITICAL	0	0	0	not found	Low
13	OLD RIVER RD	ROUND	STEEL CORRUGATED	POOR	15	15	30		Low
14	PROSPER RD	ROUND	STEEL CORRUGATED	POOR	18	18	30	inlet needs cleaning	Low
16	PROSPER RD	ROUND	STEEL CORRUGATED	CRITICAL	12	12	25	outlet needs cleaning sediment	Low
12	RANDALL RD	ROUND	STEEL CORRUGATED	CRITICAL	18	18	40		Low
1	REEVES RD	ROUND	STEEL CORRUGATED	CRITICAL	18	18	30		Low
11	RIVERSIDE PARK RD	ROUND	PLASTIC CORRUGATED	POOR	15	15	30	inlet needs cleaning	Low
5	THE LANE	ROUND	PLASTIC CORRUGATED	CRITICAL	12	12	20	inlet plugged	Low
7	THE LANE	ROUND	STEEL CORRUGATED	POOR	15	15	20	outlet needs cleaning	Low
8	THE LANE	ROUND	STEEL CORRUGATED	POOR	15	15	20	outlet needs cleaning	Low
3	WESTERDALE RD	ROUND	STEEL CORRUGATED	CRITICAL	18	18	40	completely plugged needs cleaning	Low
13	WESTERDALE RD	ROUND	STEEL CORRUGATED	POOR	18	18	45	inlet needs cleaning	Low
								13 high priority culverts	
								30 med priority culverts	
								54 low priority culverts	
								97 priority culvert projects	

## Appendix E: Village of Woodstock List of Priority Culverts for Improvement/Repair

Village of Woodstock Poor Culvert Condition Priorities 2014									
Culvert No.	RDFLNAME	STR_TYPE	STR_MAT	CONDITION	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	CONDCOMMNT	TIER
5	CHARLES ST	DI	STEEL	POOR	12	12	40	83 plugged	High
1	COLLEGE HILL RD	CULVERT	PLASTIC	CRITICAL	12	12	70	999 drop inlet outlet not found	High
3	COLLEGE HILL RD	CULVERT	PVC PIPE	POOR	8	8	100	outlet not found	High
1	HIGHLAND AVE EXT	CULVERT	STEEL	CRITICAL	12	12	35	old filled needs attention	High
3	LINCOLN ST	CULVERT	PVC PIPE	CRITICAL	12	12	40	filled, inlet not found	High
3	SLAYTON TER	CULVERT	STEEL	POOR	12	12	50		High
1	SCHOOL ST	DI	PVC PIPE	CRITICAL	8	8	18	150	Med
2	SCHOOL ST	DI	STEEL	CRITICAL	12	12	100	149	Med
2	SWAIN ST	DI	STEEL	POOR	12	12	60	153	Med
2	BORDER LN	CULVERT	PLASTIC	POOR	15	15	35		Low
15	GOLF AVE	DI	STEEL	POOR	15	15	35	139	Low
1	PINE ST	CULVERT	STEEL	POOR	18	18	50	stone header	Low
1	SLAYTON TER	CULVERT	STEEL	POOR	15	15	30		Low
								6 high priority culverts	
								3 med priority culverts	
								4 low priority culverts	
								13 priority culvert projects	

## **Attachments**

### **Attachment A: Town of Woodstock Priority Culverts Overview Map**



# TOWN OF WOODSTOCK 2014 Culvert Inventory

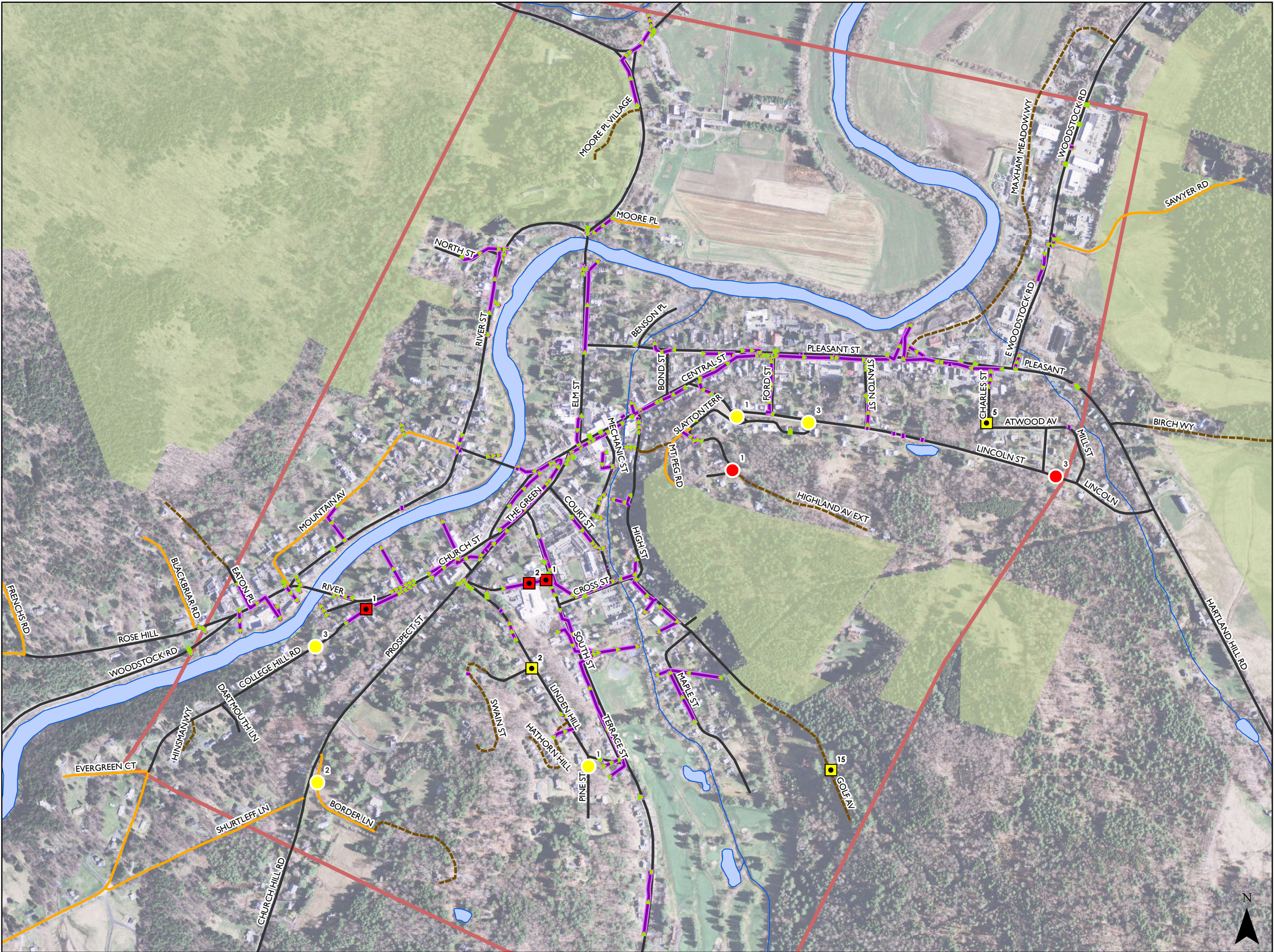
- Road Type**
  - Paved
  - Gravel
  - Trails
  - Class 4

- Village boundary
  - Atlas grid
  - Conserved land

## Poor Culverts

- Poor (46)
  - Critical (49)
  - Unknown (2)
- Total Culverts (97)

## **Attachment B: Village of Woodstock Priority Culverts Overview Map**



### VILLAGE OF WOODSTOCK 2014 Culvert Inventory

- Village boundary
- Atlas grid
- Conserved land

#### Road Type

- Paved
- Gravel
- Trails
- Class 4

#### Culvert Conditions

- Poor (8)
- Critical (5)
- Total Culverts (13)
- Drop Inlets
- Flow Direction

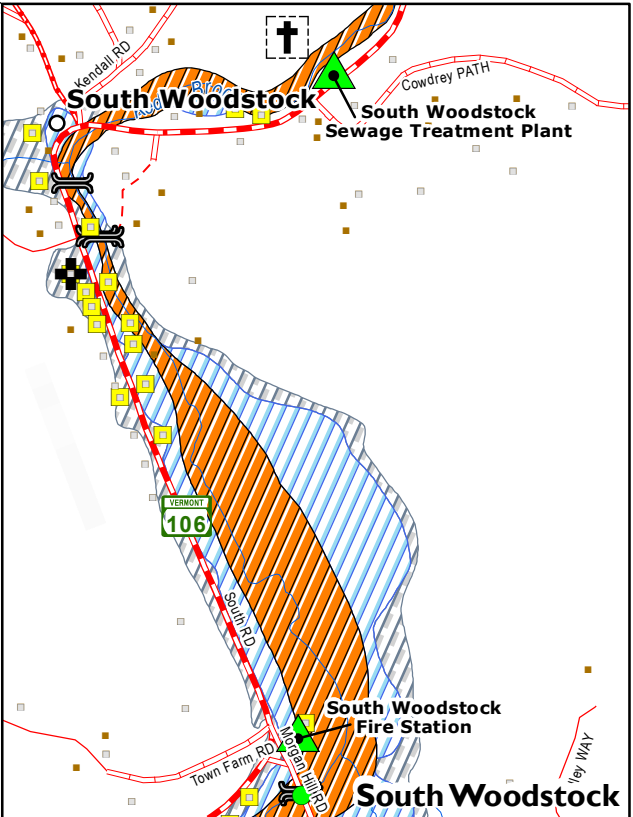
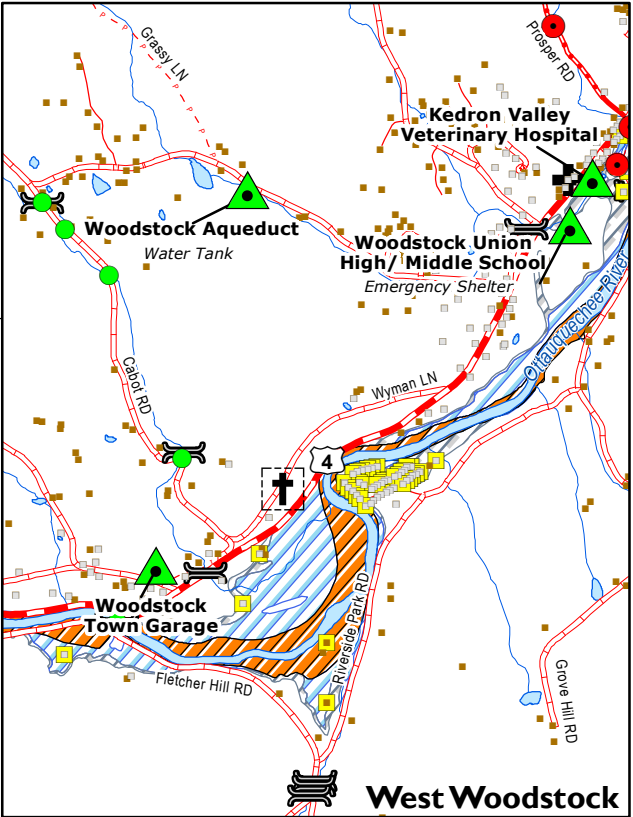
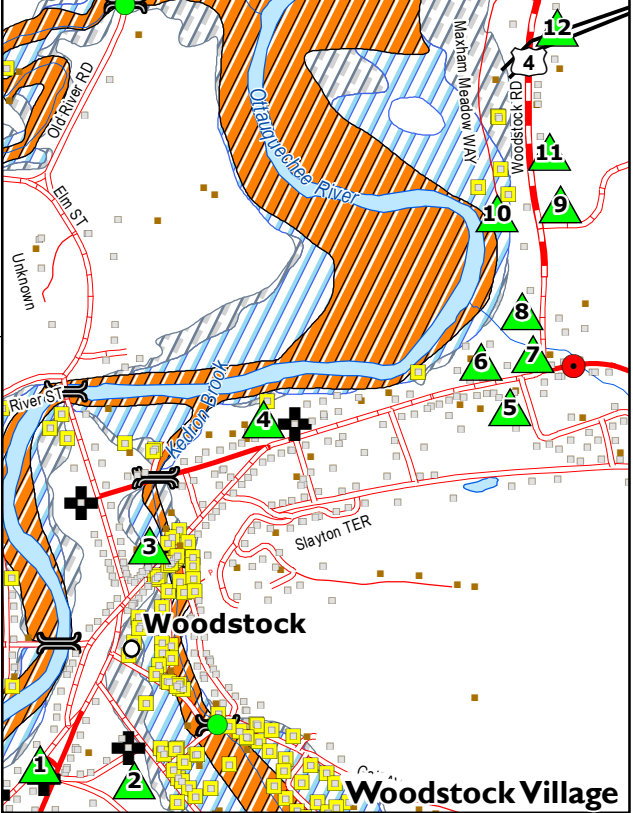
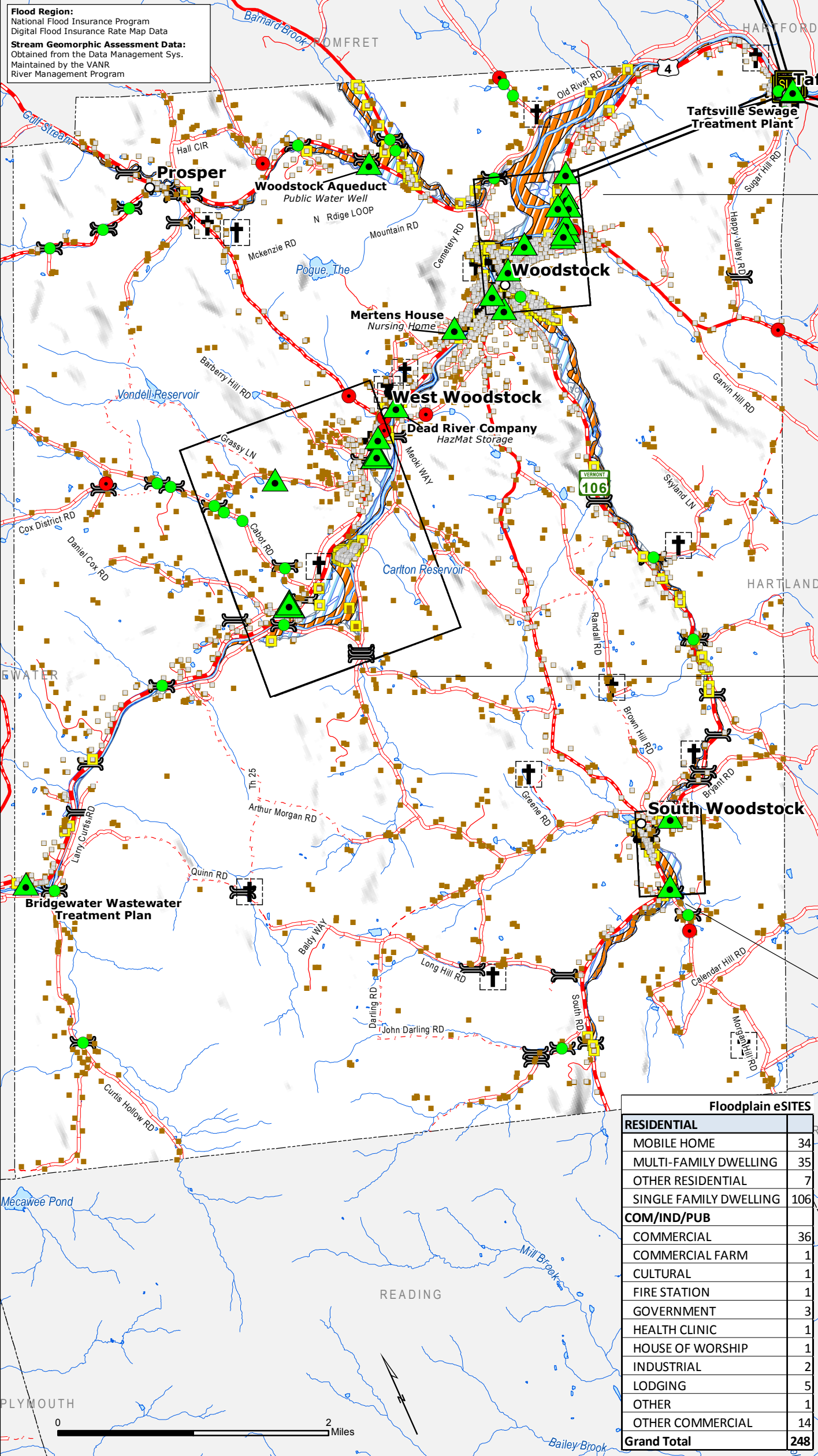


TRORC -- November 2014

Two Rivers-OttawaQuechee  
Regional Commission

**GIS Service Center**  
128 King Farm Rd  
Woodstock, VT 05091  
802-457-3188  
[www.trorc.org](http://www.trorc.org)

## **Attachment C: Map of the Town and Village of Woodstock**



# Hazard Mitigation Plan Essential Services Map Woodstock, Vermont

- TH cls 1 (village VT rt)

TH cls 2

TH cls 2 gravel

TH cls 3

TH cls 3 gravel

TH cls 4 impassable

VT forest hwy

trail

private

VT route

US route

US interstate

TH cls 4 gravel

TH cls 4 primitive

Electrical Transmission
- Critical Facility

Critical Stream Crossing

Church

Cemetery

Significantly Undersized Structure

Bridge

Electric Substation

e911 in Floodplain

e911 Within 1000' of Major Route

e911 Address

Floodplain eSITES	
RESIDENTIAL	
MOBILE HOME	34
MULTI-FAMILY DWELLING	35
OTHER RESIDENTIAL	7
SINGLE FAMILY DWELLING	106
COM/IND/PUB	
COMMERCIAL	36
COMMERCIAL FARM	1
CULTURAL	1
FIRE STATION	1
GOVERNMENT	3
HEALTH CLINIC	1
HOUSE OF WORSHIP	1
INDUSTRIAL	2
LODGING	5
OTHER	1
OTHER COMMERCIAL	14
Grand Total	248

Woodstock Village Label	Name	facDescription 1	facDescription 2	facDescription 3
1	Town Office	Town Hall	Emergency Operations Center	
2	Elementary School	Emergency Shelter	HazMat Storage	
3	Post Office	HazMat Storage		
4	Ottawaquechee Health Center	Nursing Home	HazMat Storage	
5	Woodstock Sunoco	HazMat Storage		
6	Windsor County Sheriff			
7	Maplefields	HazMat Storage		
8	Cumberland Farms	HazMat Storage		
9	Woodstock Terrace	Nursing Home		
10	Woodstock Sewage Treatment Plant			
11	Emergency Services	Volunteer Fire Dept.	Emergency Operations Center	EMS/ Police
12	Veremedy Pet Hospital	Veterinary Hospital		

- Floodway
- 100 Year
- 100 Year, No BFE
- 500 Year

TWO RIVERS-OTTAUQUECHEE

REGIONAL COMMISSION

GIS Service Center

128 King Farm Rd

Woodstock, VT 05091

802-457-3188

trorc.org