

Town of Rochester, Vermont

Local Hazard Mitigation Plan

Adopted April 14, 2014

~

Approved June 16, 2014

Prepared by the Two Rivers-Ottawaquechee Regional Commission and the Town of
Rochester

Certificate of Adoption

The Town of Rochester
Select Board
A Resolution Adopting the Local Hazard Mitigation Plan
April 14, 2014

WHEREAS, the Town of Rochester 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

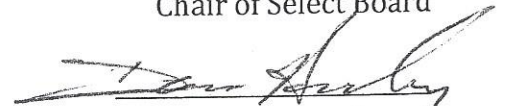
WHEREAS, the Rochester Local Hazard Mitigation Plan contains several potential projects to mitigate damage from disasters that could occur in the Town of Rochester; and

WHEREAS, a duly-noticed public meeting was held by the Town of Rochester Select Board on April 14 2014 to formally adopt the Rochester Local Hazard Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Rochester Select Board adopts the Rochester Local Hazard Mitigation Plan Update.



Chair of Select Board



Member of Select Board

ATTEST





FEMA

Larry Straus, Chair
Rochester Selectboard
Town of Rochester
P.O. box 238
Rochester, VT 05767-0238

JUL 01 2014

Dear Mr. Straus:

Thank you for the opportunity to review the Town of Rochester, Vermont Local Hazard Mitigation Plan. The Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) Region I has evaluated the plan for compliance with 44 C.F.R. Pt. 201. The plan satisfactorily meets all of the mandatory requirements set forth by the regulations.

With this plan approval, the Town of Rochester is eligible to apply to Vermont Division of Emergency Management & Homeland Security for mitigation grants administered by FEMA. Requests for mitigation funding will be evaluated individually according to the specific eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in your community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.


Approved mitigation plans are eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Complete information regarding the CRS can be found at www.fema.gov/business/nfip/crs.shtm, or through your local floodplain administrator.

The Town of Rochester, Vermont Local Hazard Mitigation Plan must be reviewed, revised as appropriate, and resubmitted to FEMA for approval within five years of the plan approval date of June 16, 2014 in order to maintain eligibility for mitigation grant funding. We encourage the Town to continually update the plan's assessment of vulnerability, adhere to its maintenance schedule, and implement, when possible, the mitigation actions proposed in the plan.

Larry Straus
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Once again, thank you for your continued dedication to public service demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please do not hesitate to contact Marilyn Hilliard at (617) 956-7536.

Sincerely,



Paul F. Ford
Acting Regional Administrator

PFF:mh

cc: Ray Doherty, Vermont State Hazard Mitigation Officer
Rob Evans, Vermont State NFIP Coordinator
Samantha Holcomb, Planner, TRORC

Enclosure

Town of Rochester, Vermont

Local Hazard Mitigation Plan

***Prepared by the Two Rivers-Ottawaquechee Regional Commission and
the Town of Rochester***

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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 Local Hazard Mitigation Plan (hereafter referred to simply as the Plan) seeks to provide an all-hazards mitigation strategy that will make the community of Rochester 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 mitigations strategies’ can, (1) avert the hazard by redirecting its impact 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, relocating/removing buildings in the flood zone, or ensuring development is disaster resistant.

II. Purpose of the Plan

The purpose of this Plan is to assist Rochester in identifying all hazards facing the town, rank them and identify strategies to begin reducing risks from known priority hazards.

The Town of Rochester seeks to be in accordance with the strategies, goals, and objectives of the State Hazard Mitigation Plan.

The 2013 Rochester Local Hazard Mitigation Plan is the first stand-alone Hazard Mitigation Plan drafted for the Town. Previously, the Town had a town-specific 2009 Annex to 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 community

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

III. Community Profile

Rochester is located in the center of Vermont and in the northwest corner of Windsor County. It is a most oddly shaped Town, abutted by eight towns and three counties. The main stem of the Upper White River runs north to south through the Town, and the West Branch flows in from the west. There are mountain ranges on both sides of the River, with the western side of the valley being the spine of the Green Mountains, creating a narrow valley through which Vermont Route 100 runs. The picturesque village is located approximately in the center of the township. The Town contains approximately 36,000 acres, and of that, about one-third is Green Mountain National Forest (GMNF) land owned by the U.S. Forest Service (USFS). The Town works cooperatively with the governments of the United States and the State of Vermont to prevent and respond to fires.

According to Vermont Housing Data, there were 532 year-round housing units and 300 seasonal housing units in Rochester in 2010, totaling 832. In 2000, there were 768 units. This marks a modest increase in housing units. About a third of these buildings were built prior to 1939. The Town receives its power from Green Mountain Power, which supplies electrical power to all sections of town.

The construction of a new fire station is almost complete, with its doors opening in the summer of 2013. The new fire station is a 4-bay structure with a kitchen, handicap bathroom, and training area. Town officials believe that it will be adaptable for future use and can be setup as an emergency command center. It is equipped with a generator and sprinklers. The department is chartered for up to 30 members, all of whom are required to attend firefighting classes. Executive officers are elected biannually, consisting of a Chief, a First and Second Assistant Chief, one Captain, one Lieutenant, Secretary, Treasurer, and two Stewards.

Emergencies are reported using 9-1-1 for the Town. Royalton State Police Barracks acts as the system's dispatching service. Volunteers are equipped with portable pagers. Neighboring towns of Hancock, Stockbridge and Granville respond to all structure fires as mutual aid is important due to daytime manpower shortages. Cooperation among towns is also important due to the rising costs of firefighting equipment. The Rochester volunteer fire department also serves with the White River Valley Ambulance to assist in their response.

A First and a Second Constable are appointed by the Selectboard. The Town provides a 2013 Dodge 4x4 pick-up for use by the Constables. Vermont State Police may be reached by calling 9-1-1. The Constable and Town residents may call upon the Vermont State Police (Troop D), with barracks in Royalton or the Windsor County Sheriff's Department, for assistance. At the present time, the law enforcement procedures in Rochester are considered adequate for Rochester's present population.

After years of service, Rochester's main emergency medical service provider, Valley Rescue Squad, disbanded at the end of June 2013. Another local ambulance squad, White River Valley Ambulance Inc. (WRVA), will have a station in the town of Rochester. It is the intention of WRVA to serve Rochester and

the other Vermont Route 100 corridor towns out of this station. The closest hospital is Gifford Medical Center, located in Randolph. Medivac services are available by the DHART helicopter.

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 of Rochester with updating its Hazard Mitigation Plan.

The core planning team was comprised of Rochester's emergency services, a member of the Selectboard and other stakeholders in the community. 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
Larry Straus	Selectboard Chair/ Road Foreman/ Emergency Director	On 2/7/2013, TRORC staff sent an introductory letter and e-mail to Selectboard members (Larry Straus, Doon Hinderyckx, and Marvin Harvey). In this letter, TRORC's staff requested names and contact information for potential committee members to revise Rochester's HMP. Rochester's Selectboard Chair, Larry Straus, responded by inviting TRORC's staff to the next Selectboard Meeting to explain the program to the Selectboard. TRORC's staff attended that meeting. Larry Straus then invited individuals to be part of the committee. TRORC then held many more meetings in which participants revised the HMP (see "Activities" section below for specific details of each meeting.
Mark Belisle	Town Constable	
Terry Severy	Rochester Fire Department, Chief/ Water System Operator	
Kevin Dougherty	Rochester Fire Department, Assistant Chief	
Jolanta Labejsza	Rochester School Board	

Additional Participants in the Process:

- Selectboard members: Doon Hinderyckx, and Marvin Harvey

B. Plan Development Process

The 2009 Rochester Annex was originally part of the 2008 multijurisdictional 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 Rochester Annex received subsequent FEMA approval, but since it

was part of a larger plan, FEMA treats its start date as on September 30, 2008 and so it expired on September 30, 2013.

This Plan has been reconstructed now as a single jurisdiction, standalone Rochester 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.

This section of the Plan satisfies the Element A: Planning Process requirements set out in 44 CFR 201.6.
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The changes to this plan include:

- **General**
 - New sections: Plan Development Process, 2009 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**
 - Severe Weather and Water Supply Contamination is now on the list of “top threats;”
 - Fire has been removed from the list of “top threats”
 - Severe Weather events are now depicted in a chart that shows the multiple hazards involved during each event;
 - For each hazard, a location/vulnerability/extent/impact/likelihood table has been added to summarize the hazard description.
- **Maps**
 - A map of the Town of Rochester depicting critical facilities, town infrastructure, and the NFIP designated floodway and 100 year floodplain has been added.

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

- **Activities**
 - 2/7/2013: Introductory letter and email indicating that the town’s HMP would soon expire and explaining the process for revising and readopting. Requested names and contact information for potential committee members to revise HMP. Sent to Selectboard members (Larry Straus, Doon Hinderyckx, and Marvin Harvey).
 - 5/13/2013: Met with the Rochester Selectboard and described the Hazard Mitigation Program and process of updating their hazard mitigation plan. Selectboard meetings are public and their agendas are posted in advance.
 - 6/17/2013: Met with emergency services personnel and the Rochester Selectboard Chair to review the status of the hazard mitigation strategies identified in the 2009 Rochester Annex. The group also reviewed the existing hazard mitigation programs, projects and activities and received input from group members. Finally, the group used the hazard ranking methodology to determine which hazards Rochester was most vulnerable to. Once all the hazards were ranked, the group discussed the hazard

rankings to be sure the ones that ranked the highest, were the hazards Rochester should focus on.

- 8/14/2013: The update committee reviewed and discussed the first draft. Their input was recorded and incorporated into this document.
- 9/16/2013: With the help of TRORC staff, the update committee discussed and identified the mitigation actions/projects/programs to be included in the 2013 Hazard Mitigation Plan.
- 11/11/2013: TRORC staff attended a Selectboard meeting on to inform Rochester residents about the planning process and the work that had been done on the Town's Hazard Mitigation Plan. TRORC staff also collected comments at the meeting. *Prior to the meeting, two revised drafts of the Plan were available for review at the Town Office.* The information session was added to the posted Selectboard agenda and a notice was posted on the Town's website to alert members of the public that the session would be taking place.

- **Public participation and involvement (44 CFR 201.6(b)(1))**

***Note: The meetings listed below were public sessions.*

- 5/13/2013: Met with the Rochester Selectboard and described the Hazard Mitigation Program and process of updating their hazard mitigation plan. Residents in attendance at the Selectboard meeting were invited to become part of the Hazard Mitigation Plan update process.
- 6/17/2013: Determined the status update of existing hazard mitigation activities/projects/programs and ranked hazards.
- 8/14/2013: The update committee reviewed and discussed the first draft. Their input was recorded and incorporated into this document.
- 9/16/2013: With the help of TRORC staff, the update committee discussed and identified the mitigation actions/projects/programs to be included in the 2013 Hazard Mitigation Plan.
- October 2013: A notice was placed in the Two Rivers-Ottawaquechee Regional Planning Commission Newsletter alerting recipients that Rochester was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan.
- 11/11/2013: TRORC staff attended a Selectboard meeting on to inform Rochester residents about the planning process and the work that had been done on the Town's Hazard Mitigation Plan. TRORC staff also collected comments at the meeting. *Prior to the meeting, two revised drafts of the Plan were available for review at the Town Office.* The information session was added to the posted Selectboard agenda and a notice was posted on the Town's website to alert members of the public that the session would be taking place.

- **Governmental participation and involvement (44 CFR 201.6(b)(2))**

- Sent revised draft to Rochester Planning Commission Chair (November 4, 2013).
- Sent revised draft to Vermont Division of Emergency Management and Homeland Security (November 25 2013).

- **Neighboring community participation and involvement (44 CFR 201.6(b)(2))**
 - October 2013: A notice was placed in the Two Rivers-Ottawaquechee Regional Planning Commission Newsletter alerting recipients that Rochester was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan.
 - Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place.
 - Valley News—ran October 23, 2013
 - The Herald of Randolph—ran October 24, 2013
 - Journal Opinion—ran October 23, 2013
 - Vermont Standard—ran October 24, 2013
 - Sent revised draft to neighboring town's Selectboards for comment (November 4, 2013).
 - Towns of: Hancock, Granville, Braintree, Bethel, Stockbridge, Pittsfield, Goshen, Chittenden.
 - No comments were received.
- **Review of existing plans, studies, reports, and technical information (44 CFR 201.6(b)(3))**
 - Rochester Hazard Mitigation Plan (Adopted 4/27/2009)
 - This Plan was referenced extensively during the plan development process, especially in regard to the worst threats and mitigation action strategies identified in 2009.
 - Rochester Town Plan (Readopted 4/30/2012 from Rochester's 2007 Town Plan)
 - The Town Plan provided TRORC's staff with background information on the community, as well as more detail on their emergency services.
 - Town of Rochester, VT – Annual Report (2012)
 - The Annual Report provided TRORC's staff with an overview of Rochester's 2011-2012 Fiscal Year.
 - Rochester's Well-Head Protection Plan (Adopted October 11, 2002. Last amended June 15, 2012)
 - Rochester's Well-Head 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).

C. Status Update on Mitigation Actions Identified in 2009

The following table outlines the mitigation actions that were proposed in Rochester's 2009 All-Hazard Pre-Disaster Mitigation Plan for the Town of Rochester (adopted on April 27, 2009 as an appendix to the Two Rivers-Ottawaquechee Regional Commission's multi-jurisdictional Pre-Disaster Mitigation Plan). Participants in the new Plan update process reviewed those actions and reported on the status of each:

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

2009 Mitigation Action	2013 – Status of Mitigation Action
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<u>ALL HAZARDS</u> 1. Ensure that Rapid Response Plan (RRP) is current.	<input checked="" type="checkbox"/> Complete. The new iteration of the RRP is the Basic Emergency Operations Plan (BEOP). Rochester updates this document annually. Their most recent BEOP was updated and then adopted on 5/14/2013 by the Rochester Selectboard.
2. Re-write and update existing Emergency Operations Plan	<input checked="" type="checkbox"/> Complete. Rochester updates its entire Basic Emergency Operations Plan (BEOP) each year. It was last revised and re-adopted on 5/14/2013.
3. Participate in post disaster training programs.	Emergency services personnel participated in a tabletop exercise in 2012, but remarked at how few training opportunities existed.
4. Review and modify evacuation and sheltering plan based on results of procedures implemented in an actual hazard incident.	Rochester has a designated Red Cross shelter that was used during Tropical Storm Irene. They also have a second shelter at the church. Their basic evacuation plan is reviewed and updated yearly.
<u>FLASH FLOOD</u> 5. Continue the planned road maintenance program and update existing culvert inventory. Upgrade culverts and ditching.	Culvert inspection and upgrading is done yearly. A number of culverts have been upgraded since Tropical Storm Irene hit Vermont.
6. Participate in NFIP training offered by the State and/or FEMA, or in other training, that addresses flood hazard planning and management.	Not complete. Town officials remarked that they have not seen many NFIP training opportunities offered.
<u>HAZMAT</u> 7. Pursue HAZMAT training for Fire Department	The Rochester Fire Department received Awareness Level HAZMAT training in the fall of 2010. A number of Fire Department members are also trained at the HAZMAT Operations Level.
<u>WINTER STORM</u> 8. Educate citizens on preparedness for winter travel and extended power outages.	Not complete. No genuine effort has been put forth.
9. Encourage utilities to continue a regular schedule of tree trimming along power lines	Annual. The power companies handle tree trimming on their own and keep the trees well-trimmed.
<u>FIRE</u> 10. Upgrade or relocate fire station to improve space and storage for equipment.	<input checked="" type="checkbox"/> Complete. A new fire station, equipped with sprinklers, is currently under construction and will be occupied mid to late 2013.
11. Institute a smoke detector awareness program through a survey conducted by students at the high school.	Not complete.
12. Conduct regular drills at high school and elementary school.	Not complete.
13. Investigate ways to ensure the safety of the population of the Park House in the event of fire	Annual. A walk through is conducted by the Fire Department each year, and the Park House staff keeps and up-to-date list of individuals in the building.
14. Work with TRORC and Green Mountain National Forest (GMNF) to develop wildfire response plan	<input checked="" type="checkbox"/> Complete. The Town of Rochester developed a "Community Wildfire Protection Plan" which was completed in 2008. The Fire Department Chief will contact GMNF for information about a possible update.

15. Consider installation of fire sprinkler systems in the closely spaced historic downtown structures.	<input checked="" type="checkbox"/> Complete/in process. The Pierce Hall Community Center has been equipped with sprinklers. The Rochester Public Library has plans for renovation, but probably will not require sprinklers.
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There are no current plans for new development in the Town of Rochester.

D. Existing Hazard Mitigation Programs, Projects & Activities

The Town of Rochester is currently engaged in the following hazard mitigation programs, projects and activities:

Community Preparedness Activities

- Annual update of Rochester's Basic Emergency Operations Plan (BEOP)
 - Current copy was updated and formally approved on 05/14/2013.
- Rochester, Vermont—Community Wildfire Protection Plan (2008)
- Citizens Emergency Response Team (CERT) Training
- Participation in the Local Emergency Planning Committee (LEPC) #12

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

Insurance Programs

- Participation in National Flood Insurance Program (NFIP)
 - Rochester's initial Flood Hazard Boundary Map was identified on 12/20/74 and their initial Flood Insurance Rate Map (FIRM) was dated 8/5/91. The Town's FIRM has been updated, and the current effective map date is 9/28/07. The Rochester Zoning Administrator serves as the NFIP Administrator.
 - Zoning Regulations adopted on 9/28/2009 contain their Flood Hazard Bylaw, and limitations/requirements for new development within the Special Flood Hazard Areas.

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

Land Use Planning

- Rochester Town Plan
 - Readopted on 04/30/2012. A new Town Plan is currently being drafted.
- Zoning Regulations
 - Adopted on 09/28/2009
 - Includes Flood Hazard Bylaw and limitations/requirements for development within the Special Flood Hazard Areas.
- Rochester's Hazard Mitigation Plan (Annex)
 - Adopted 04/27/2009
- Rochester's Well-Head Protection Plan

- Adopted 10/11/2002. Last amended 06/15/2012.
- Rochester Subdivision Bylaw
 - Adopted 11/22/2010
- Community Wildfire Protection Plan
 - Adopted 07/2008

Hazard Control & Protection of Critical Infrastructure & Facilities

- Culvert inventory completed by Two Rivers-Ottawquechee Regional Commission (last updated in 2009)
- The Town of Rochester maintains a list of culverts that is updated in-house each year.
- Upgraded multiple culverts since Tropical Storm Irene (Marsh Brook Road, Cemetery Road, Little Hollow Road, South Hollow Lane, North Hollow Lane, Moose Run Road, Oak Lodge Road and, Flanders Hill Road)
- Working with White River Partnership to improve culverts.

Education/Public Outreach

- Community Recovery Partnership Meeting
 - Organized by the State of Vermont and partnering organizations for the following towns—Rochester, Pittsfield, Stockbridge, Granville and Hancock—in the aftermath of Tropical Storm Irene (Aug. 2011). Meeting held on Jan. 30, 2012 in Rochester, VT.
- Rochester is participating in the Digital Economy project through the Vermont Council on Rural Development
 - The Town has applied for a grant to install an emergency wireless communication hotspot powered by solar power on the Town Office property.
- Work related to communications, new radios have been updated and installed in the school, school buses, Town highway trucks, and the Town Office. These entities now have a connected means of communication.

E. Plan Maintenance

This Plan (the Rochester Local Hazard Mitigation Plan) will be updated and evaluated annually at a May Selectboard meeting along with the review of their Basic Emergency Operations Plan (BEOP). 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.

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).

Updates and evaluation of this Plan by the Selectboard and the local Emergency Coordinator/Director will also occur within three months after every federal disaster declaration. The Town shall reference

the Local Hazard Mitigation Plan when working on Town Plan amendments or changes to the Town's bylaws.

The Two Rivers-Ottawaquechee Regional Commission (TRORC) will help with Plan updates if assistance is requested by the Town of Rochester and funding is available. If TRORC is unable to assist the Town, then Rochester's Town Clerk, Administrative Assistant, or Selectboard will update the Plan, or the Selectboard may appoint a committee of interested citizens (including the current local Emergency Coordinator/Director) to draft changes.

The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice in the municipal building, The Herald of Randolph and TRORC newsletter and blog inviting the public to the scheduled Selectboard (or specially scheduled) meeting. Additional stakeholders shall be invited to the meeting; these include: White River Valley Ambulance, Inc., a representative from Rochester Schools, the White River Partnership 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 Town Clerk.

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.

Rochester 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 Local Hazard Mitigation Plan will help the town to comply with the new community flood resiliency requirement for town plans adopted after July 2014.

It is also recommended the process work both ways and the Town review and incorporate elements of the Local Hazard Mitigation Plan when updating the municipal plan, zoning regulations, and flood hazard/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. By 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 Rochester 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 of Rochester, 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 Rochester 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 Rochester.¹ The top threats (bolded in the table, below) are then followed-up with discussion and mitigation strategies throughout the rest of this Plan.² 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.

¹ 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).

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

Hazard	Frequency of Occurrence	Warning Time	Potential Impact	Hazard Score
<i>Severe Weather (Thunderstorm, Lightning, High Winds, Hail, and Flooding)</i>	Highly Likely	None	Moderate	11
<i>Flash Flood/Flood/Fluvial Erosion</i>	Likely	3-6 hours	Major	10
<i>Extreme Cold/Snow/Ice Storm</i>	Highly Likely	3-6 hours	Moderate	10
<i>Hazardous Material Spill</i>	Occasionally	None	Major	10
<i>Water Supply Contamination</i>	Occasionally	None	Major	10
<i>Structure Fire</i>	Highly Likely	None	Minor	10
<i>Lightning</i>	Highly Likely	None	Minor	10
<i>High Wind</i>	Likely	3-6 hours	Moderate	9
<i>Wildfire</i>	Likely	None	Negligible	8
<i>Tornado</i>	Unlikely	None	Moderate	8
<i>Ice Jams</i>	Likely	None	Minor	8
<i>Hail Storm</i>	Likely	Minimal/None	Negligible	8
<i>Landslides/Mudslides</i>	Occasionally	None	Minor	8
<i>Hurricanes/Tropical Storms</i>	Occasionally	12+ hours	Major	7
<i>Earthquake</i>	Occasionally	None	Negligible	7
<i>Invasive Species/Infestation</i>	Highly Likely	12+	Minor	7
<i>Drought</i>	Occasionally	12+ hours	Minor	5
<i>Extreme Heat</i>	Occasionally	12+ hours	Minor	5
<i>Avalanche</i>	Unlikely	N/A	N/A	1
<i>Dam Failure (no dams in Rochester)</i>	N/A	N/A	N/A	N/A
<i>Tsunami (Vermont is landlocked)</i>	N/A	N/A	N/A	N/A
<i>Volcano (There are no active volcanoes in Vermont).</i>	N/A	N/A	N/A	N/A

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

- Severe Weather (Thunderstorm, Lightning, High Winds, Hail, and Flooding)
- Flash Flood/Flood/Fluvial Erosion
- Extreme Cold/Snow/Ice Storm
- Hazardous Material Spill
- Water Supply Contamination

****Note:** While there were six hazards that received a **Hazard Score** of “10” the Rochester Committee discussed the vulnerability of their Town to the hazards, taking into account the number of people that could be affected, and the infrastructure that could be damaged, and chose to eliminate “Structure Fire” and “Lightning” from further analysis.

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-#) when applicable. Hazards information was gathered from local sources (ex. town history book), 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 for 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	Anticipated/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. Severe Weather (Thunderstorm, Lightning, High Winds, Hail, Flooding)

More common than hurricanes or tropical storms are severe thunderstorms (usually in the summer), which can cause flooding as noted above, and are associated with lightning, high winds, hail and tornadoes. Hailstorms have occurred in Vermont, usually during the summer months. While local in nature, these storms are especially significant to area farmers, who can lose entire fields of crops in a single hailstorm. Large hail is also capable of property damage. 382 hail events were recorded between 1950 and 2008 in the state, making hail a regular annual occurrence in at least some parts of the state. Most of these events had hail measuring .75 inches, but many had hail at least 1.5 inches in size. The largest hail during the period was 3-inch hail that fell in Chittenden County in 1968 (NCDC). Tennis ball-sized hail was reported in the adjacent town of Chittenden during a storm in the summer of 2001. Thunderstorms can generate high winds, such as hit the region on July 6, 1999, downing hundreds of large trees in a few minutes.

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 **Severe Weather (Thunderstorm, Lightning, High Winds, Hail, Flooding)**.

In Rochester, severe weather is quite common, typically in the late spring and summer months when the region experiences high temperatures. Severe thunderstorms tend to bring other hazards such as high winds, hail, lightning, and flooding. These hazards are often experienced in combinations which create many unique weather and emergency management situations. Over the years, Rochester has been hit with high winds that have downed and uprooted numerous trees, and knocked out electricity to residents in the Town. Town-specific wind data could not be found, but the “Remarks” section of the NCDC Database helps to illuminate the impact strong winds can have on Rochester.

The following list indicates the history of occurrence with regard to this hazard in Windsor County, given the relatively small population of Rochester; town-specific data is limited. Federal disaster numbers are listed when appropriate. Damage estimates will only be provided when the weather event is only listed for the Town of Rochester, and if that data is available. In an attempt to capture the individual hazards that may arise, and the different circumstances caused by the hazards in concert, the separate hazards are documented in the table below.

History of Occurrences:

Severe Weather Date	Event Characteristics					Location	Extent
	Thunderstorm/ severe storm	Flooding	Hail	High Winds	Lightning		
06/25/2013— 07/11/2013 (DR 4140)	✓	✓				Rochester, County-wide	

Severe Weather Date	Event Characteristics					Location	Extent
	Thunderstorm/ severe storm	Flooding	Hail	High Winds	Lightning		
08/28/2011 (DR 4022 VT for period of 08/26/2011 – 09/2/2011)	✓	✓				Rochester, County-wide	Tropical Storm Irene. 9" of rain in Rochester according to local reports. Severe damage to state and town road infrastructure including VT Route 100. \$3,010,499.39 in damages according to FEMA's Public Assistance Database (captures at least 70% of the total damage).
08/21/2011	✓			✓		County-wide	
05/26/2011 - 05/27/2011 (DR 4001 VT)		✓				Rochester, County/region wide	
05/09/09	✓			✓		Rochester, County-wide	Wind damage downed trees and power lines, leaving approximately 180 customers in Rochester without power.
08/06/2008 DR 1790	✓	✓				Rochester, southern Green Mountains region.	3-5" of rainfall. Damage to road infrastructure. \$425,000 in damage.
06/29/2003	✓			✓		Rochester	Trees and power lines blown down by wind, resulting in the loss of power. \$5,000 in damage.
05/01/2003	✓			✓		Rochester	Tree limbs blown down by winds. \$5,000 in damage.
7/6/1973 (DR 397 VT)	✓	✓				Rochester, county-wide	8.53" reported in Rochester. Severe storms; landslides in region.

The Town of Rochester has experienced high wind events in the past. Thankfully, the damage caused by high winds has been relatively minimal. Often power outages occur as a result of trees and tree limbs falling on power lines. However, the utility companies currently serving the Town of Rochester, including Green Mountain Power, have followed a regular tree-trimming schedule. Rochester officials believe this is satisfactory to mitigate damage and the power outages caused by downed trees and tree limbs during a high wind event.

The main hazard caused by severe weather throughout the Town is flooding. Prior to the flooding from Tropical Storm Irene, spring of 2011 was particularly wet, and a pre-Memorial Day storm caused widespread flooding throughout Windsor County. The road and other infrastructure damaged during this flooding event included 32 roads, sewers, athletic fields, tennis courts, and a cemetery, among others. The following roads were among the most heavily damaged during Tropical Storm Irene: Little Hollow Road, North Hollow Road, Brook Street, Fiske Road, Marsh Brook Road, Bethel Mountain Road, and Bingo Road. During “regular” flooding events, there are two Town roads which flood regularly because of inundation flooding: Beans Bridge Road and Bingo Road. Beans Bridge Road is one of the most frequently flooded roads in the Town, having to be repaired 3-4 times a year, on average. All other Town roads are subject to erosional flooding when heavy rain events drop large amounts of rain in a short period of time.

In an attempt to improve the flow of floodwater through the Town, Rochester has upgraded culverts on the following roads: Marsh Brook Road, Cemetery Road, Little Hollow Road, South Hollow Lane, North Hollow Lane, Moose Run Road, Oak Lodge Road and, Flanders Hill Road. A 70-foot bridge spanning the White River on River Brook Drive was also replaced with a 90 foot bridge to permit larger quantities of water to flow through. The Town maintains an up-to-date culvert inventory, which it updates annually. The work to upgrade culverts remains in process.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/Probability
Severe Weather	Town wide for wind, hail, high winds, lightning and thunderstorm impacts; for “regular” inundation flooding: Beans Bridge Road and Bingo Road. All other roads may be subject to erosional flooding, especially in steep areas.	Town and private buildings, and utilities; culverts, bridges, road infrastructure	Most recent, Tropical Storm Irene- 5-7” across county (9” in Rochester according to local reports).**	From TS Irene: \$3,010,499.39 for Rochester from FEMA’s Public Assistance database.**	Highly likely

****Note:** The main hazard caused by severe weather is typically flooding (though not always). In addition, flooding is often the most expensive hazard caused by severe weather. Therefore, the Extent and Impact categories for Severe Weather will reflect the data reported in the Flash Flood/Flood/Fluvial Erosion, as it represents the higher limits of damage caused by severe weather.

2. Flash Flood/Flood/Fluvial Erosion

Flooding is one of the worst threats to Rochester's residents and infrastructure. Past instances of flooding in Rochester 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**.

Perhaps the worst flood disaster to hit the Town of Rochester, 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, flowing at an estimated 120,000 to 140,000 cubic feet per second (cfs) at West Hartford, Vermont. Like many towns in the region, the Town of Rochester received heavy precipitation.

A more recent flood 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, and 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 one week. The flooding caused by Tropical Storm Irene is considered to be the second greatest natural disaster in 20th and 21st century Vermont, second only to the Flood of 1927.

The Town of Rochester suffered major damage to property and infrastructure during Tropical Storm Irene, although no lives were lost. It is estimated that Tropical Storm Irene dropped a locally-reported 9 inches of rain in a very short span of time, and 5-7 inches across the county. Many of Rochester's roads and culverts were damaged by the storm, including parts of the following: Little Hollow Road, North Hollow Road, Brook Street, Fiske Road, Marsh Brook Road, Bethel Mountain Road, and Bingo Road. The county-wide damage totaled \$32.5 million, and Town-wide damage was over \$3 million. Following the flood damage, the state of Vermont and FEMA has been coordinating on the home buy-out process across the state. There are four home buy-outs in Rochester: two on North Main Street, one on Robinson Avenue and one on Quarry Hill Road.

Unfortunately, flooding is very common across the region, with many events impacting the Town of Rochester specifically. The following list indicates the history of occurrence with regard to this hazard in Windsor County, and, given the relatively small population of Rochester, town-specific data is somewhat limited. Federal disaster numbers are listed when appropriate.

History of Occurrences:

Date	Event	Location	Extent
06/25/2013— 07/11/2013 (DR 4140)	Flash flooding	Rochester, County-wide	
08/28/2011* (DR 4022 VT for period of 8/26/2011 – 9/2/2011)	Severe Flash Flooding	Rochester, County/region wide	5-7" of rain across region, significant damage to state and local roads/culverts/bridges. VT Route 100 was severely damaged, and as a result, isolated the Town of Rochester for days.
5/26/2011 – 5/27/2011 (DR 4001 VT)	Flash & riverine flooding	County-wide	3-5+” of rain county-wide
10/15/2010	Flooding	County-wide	
10/01/2010	Flooding	Rochester	4-5” of rain. Flooding along the upper reaches of the White River closed Route 100 just north of Rochester near Quarry Hill Road.
08/06/2008 (07/21/2008— 08/12/2008 (DR 1790 VT))	Flash flooding/ flooding	Rochester, County-wide	3-5” of rain across southern Green Mountains. Damage to road infrastructure.
07/09/2007— 07/11/2007 (DR 1715VT)	Flash flooding	County-wide	
5/15/2006	Flooding	County-wide	
04/04/2000	Flooding	Rochester; county-wide	Steady rain combined with melting mountain snows. Water was on VT Route 100 in Rochester in late morning/early afternoon. A mudslide was reported near VT Route 73 near Rochester.
06/27/1998	Flash flooding	Rochester, county/region wide	3-6” of rain. Extensive flooding occurred along the White River and its branches. In the Vermont towns of Rochester and Bethel, extensive flooding resulted in massive road damage and washouts.
6/28/1973 - 6/30/1973	Flooding	Rochester, county-wide	8.53” reported in Rochester.
11/2/1927 – 11/4/1927* ("The 1927 Flood")	Flash flooding	Rochester, county-wide	4-9” of rain across the region. Approximately 7” in Rochester.

The Town of Rochester Floodplain Overlay District prohibits new structures in the floodplain and places restrictions on other types of activities within the floodplain. It also specifies land, area and structural requirements in the Floodplain Overlay Districts. The town bylaw has a 50-foot setback prohibition of structures being located from the top of any river or perennial stream bank within the Overlay District. These buffers seek to protect the fragile riparian habitat, improve or maintain water quality and prevent soil erosion.

There are 32 residences and 13 commercial structures within the 500-year floodplain, which equals \$7,173,820 if all properties were damaged/destroyed in a severe flooding event. There are also a few

critical facilities for the town located in the floodplain, such as the Rochester Town Garage and Rochester Water System infrastructure. The 500-year floodplain was chosen as a basis for this analysis to demonstrate the large number of Rochester properties that are or may be vulnerable to flooding. In addition, the flooding that occurred as a result of Tropical Storm Irene is considered to be slightly less than or equal to a 500-year flood. Therefore, in order to be more forward-looking, the damage to structures in the 500-year floodplain area is documented in this plan.

Due to the development restrictions mountainous terrain places on an area, “at-risk populations,” such as children or the elderly, loss income housing and critical infrastructure may be located in flood hazard areas. Across Vermont, most child and elder care facilities are not registered with the State. Most child day care is private and in-home in Rochester and there are currently no licensed facilities in the Town. The Park House is a private elder care facility in Rochester, but it is not located in the floodplain. Finally, low-income housing is not registered with the State, and there are no mobile home parks in Rochester.

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 although small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Map), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be very erosive, causing damage to road infrastructure and to topographic features, including stream beds and the sides of hills and mountains. . In the Town of Rochester, there are 15 commercial or public structures, including a pump station, and 6 residential structures located in the fluvial erosion hazard area. The presence of undersized or blocked culverts can lead to further erosion and stream bank/mountain side undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently

A number of culverts have been replaced or upgraded since Rochester’s 2009 Annex was adopted. In an attempt to improve the flow of floodwater through the Town, Rochester upgraded culverts on the following roads: Marsh Brook Road, Cemetery Road, Little Hollow Road, South Hollow Lane, North Hollow Lane, Moose Run Road, Oak Lodge Road and, Flanders Hill Road. A 70-foot bridge was also replaced with a 90 foot bridge to permit larger quantities of water to flow through. There are two Town roads which flood regularly by inundation flooding: Beans Bridge Road and Bingo Road. All other Town roads are subject to erosional flooding when heavy rain events drop large amounts of rain in a short period of time.

The last official culvert inventory completed for the Town of Rochester was in 2009; however, Rochester updates its culvert inventory in-house each year. The process of upgrading culverts is in progress.

No development projects are planned in Rochester in areas that would be vulnerable to flooding. There are no repetitive loss properties in Rochester on FEMA’s NFIP list.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/Probability
Flooding	Regular inundation flooding: Beans Bridge Road and Bingo Road. Beans Bridge Road repaired 3-4 times per year. All other roads in the Town subject to erosional flooding.	Culverts, bridges, road infrastructure. 32 residential and 13 commercial and industrial buildings in 500 year floodplain.	Most recent, Tropical Storm Irene- 5-7" across county (9" in Rochester, according to local reports).	From TS Irene: \$3,010,499.39 for Rochester from FEMA's Public Assistance database.	Highly likely

3. Extreme Cold/Snow/Ice Storm

Winter storms are a regular occurrence in Vermont. However, severe winter storms can cause serious damage, including collapse of buildings due to overloading with snow or ice, brutal wind chills, downed trees and power lines and stranded vehicles. People can be at risk of freezing in extended power outages if they lack wood heat or backup power, and individuals shoveling large accumulations of snow can also be at risk from frostbite, hypothermia and heart attacks due to cold and overexertion. While snow removal from the transportation system is standard fare in Vermont winters, extreme snow or ice can close rail and road systems, further jeopardizing any stranded persons that are in danger of freezing or needing medical assistance.

Severe winter storms include a blizzard on February 15-17 in 1958 that dumped over 30 inches and resulted in 26 deaths in New England. On December 26-27 in 1969, another blizzard left 18-36 inches of snow in northwestern Vermont and a whopping 45 inches in Waitsfield. A string of storms in March 2001 hit the state, beginning with 15-30 inches on March 5-6 (later declared a federal disaster), 10-30 inches on the 22nd and 10-20 inches on the 30th. Recent years have seen wet snow storms that have leveled trees and caused widespread power outages.

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 **Extreme Cold/Snow/Ice Storm**.

The worst winter storm in terms of damage to hit the state recently was not a snow storm, but an ice storm. In January of 1998, just the right combination of precipitation and temperature led to more than three inches of ice in spots, closing roads, downing power lines, and snapping thousands of trees. This storm was estimated as a 200-500-year event. Power was out up to 10 days in some areas and 700,000 acres in of forest were damaged in Vermont. Amazingly, there were no fatalities in Vermont, unlike Quebec where 3 million people lost power and 28 were killed.

Over the past few winters, Rochester has received numerous snow storms that have dropped significant amounts of snow over a day or two, between 8" and 15". However, the details of these events and the damage they caused are overshadowed by winter weather events of the past. This is not to say such extreme events will not repeat themselves. It should be assumed that extreme winter weather events

will occur at some point in the future. The following table documents the occurrence of extreme cold/snow/ice storms in the Town of Rochester.

History of Occurrences:

Date	Event	Location	Extent
03/18/2013 – 03/19/2013	Winter storm	County-wide	8-14" of snow fell across the county, with higher amounts above 1000 ft. Numerous vehicle accidents.
02/27/2013— 02/28/2013	Winter storm	County-wide	Snow across the county, 6-12" of snow fell across the southern Green Mountains.
12/29/2012— 12/30/2012	Winter storm	County-wide	Snowfall totals across the county were generally 5-8".
03/01/2012	Winter storm	County-wide	Widespread 4-8" inches of snowfall occurred in Windsor county with 10-14" inches along the eastern slopes of the Green Mountains.
11/22/2011— 11/23/2011	Winter storm (heavy, wet snow mixed with rain and sleet)	Rochester, County-wide	10" of snow in Rochester, 6-12" across the county. Numerous vehicle accidents, scattered power outages due to heavy snow on trees.
03/06/2011— 03/07/2011	Winter storm	Rochester, County-wide	14" in Rochester, 4-16" across the county.
12/26/2010— 12/27/2010	Winter storm (Nor'easter)	County-wide	Snowfall totals of 6-15" with localized higher amounts occurred as well as considerable blowing and drifting of the snow due to north winds of 15 to 25 mph with gusts approaching 40 mph.
02/23/2010— 02/24/2010	Winter storm	County-wide	A heavy wet snow fell across Vermont that resulted in snowfall accumulations of 6 to 30 inches with the higher amounts in the higher terrain of central and southern Vermont. 50,000+ customers without power in the region.
12/09/2009	Winter storm	County-wide	6-12" of snow along the eastern side of the Green Mountains. 60-85 mph wind knocked down power lines and caused some structural damage.
02/26/2008 – 02/27/2008	Snow	Rochester, county-wide	9" between 02/16/08 and 02/17/08. Storm broke previously set all-time snow record for February (42.3" in 2008, as recorded at National Weather Service in Burlington, VT).
04/12/2007	Winter storm (heavy wet snow, sleet, rain)	Rochester, county/region wide	10" of snow. Dangerous road conditions. Some downed tree limbs and power lines.
04/04/2007	Winter storm (rain mixed with/turned into sleet/snow)	Rochester, county/region wide	7"+ of snow.
03/06/2007	Extreme cold/wind chill	Rochester, county/region wide	Very low temperatures accompanied by 15-20mph winds. 3/6/2007 morning low temperature in Rochester: -8 degrees; 3/7/2013 morning low: -21 degrees
02/15/2007	Snow	Rochester, county-wide	25" of snow total.

Date	Event	Location	Extent
01/19/2007	Snow	Rochester, county/region wide	6" of snow.
12/30/2006	Snow	Rochester, county/region wide	3"+ of snow. "Extremely dangerous" road conditions.
01/03/2003	Snow	Rochester, county wide	14" of snow.
01/07/1998 – 01/09/1998 (DR 1201 VT)	Ice Storm	Rochester, region-wide	Approximately .50-.99" of ice fell in Rochester.

Rochester is no stranger to winter weather and the hazards that it brings. Depending on the event, particularly with heavy, wet snow or ice, electricity may be knocked out for a few hours or days, creating loss of water supply and sewer service. The utility companies currently serving the Town of Rochester, including Green Mountain Power, have followed a regular tree-trimming schedule. Rochester officials believe this is satisfactory to mitigate damage and the power outages caused by downed trees and tree limbs during a heavy, wet snow or ice event. In the event of an extended power outage, the Town would open the emergency shelter, which has a generator.

Heavy, wet snow or large quantities of snow may also leave structures vulnerable to roof collapse. Roof collapse occurs when the structural components of a roof can no longer hold the weight of the snow. Flat roofs are most vulnerable to collapse because they do not drain well and the snow on the roof soaks up water like a sponge, increasing the weight that the roof must bear. More common it seems is the collapse of barns commonly used for livestock sheltering and other agricultural purposes. Unfortunately, livestock in the barn are often killed and equipment stored in the barn may be damaged or ruined. It is difficult to determine whether a residential structure or a barn would be rebuilt after a roof collapse because the decision to rebuild would likely depend on the extent of damage. The collapse of a barn roof is likely to be a total loss, and the collapse of a house roof may be a 50% loss. While roof collapse has not occurred in Rochester recently, very heavy snow in the region on February 14, 2007 resulted in the partial or total collapse of 20 or more barn roofs, and led to the deaths of more than 100 cattle.

In general, winter weather is most hazardous for travelers. Icy and snow-covered roads produce many instances of dangerous driving conditions and other situations. In Rochester, the mountainous terrain, steep slopes, and remoteness of some roads further complicate travel. The Town relies on Travel Advisories issued by the State of Vermont Department of Emergency Management Homeland Security and the National Weather Service to alert residents of dangerous travel weather. However, it is difficult to prohibit people from driving during winter weather events. As a result, emergency services personnel must always be prepared to provide assistance to stranded motorists or to those who have been in an accident.

Hazard	Location	Vulnerability	Extent	Estimated/ Potential Impact	Likelihood/ Probability
Extreme Cold/ Snow /Ice Storm	Town wide	The entire Town is vulnerable, including road infrastructure, town and privately owned buildings, utility infrastructure.	Snow fall has varied between 4" to 2'. Heavy snow and wind downed trees and power lines. Snow/ice contributed to hazardous driving conditions.	For roof collapse: Monetary damages will depend on each structure but, collapse of barn roof is often a total loss. This does not include the loss of livestock. Collapse of a house roof may be at a 50% loss. For car crashes due to poor driving conditions: minimal damage to vehicle to totaled vehicle. Health impacts could vary significantly.	Highly likely

4. Hazardous Materials Spill

Based on available VT Tier II data, there are three sites in town that have sufficient types and/or quantities of hazardous materials to require reporting.

Rochester's village is located on Route 100, which sees a moderate quantity of truck traffic. There are 276 residential and 65 commercial, industrial or public buildings within 1,000 feet of a potential HAZMAT spill

on Route 100 and Route 73. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$2,796,960. It should also be noted that the State of Vermont currently has 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.

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**.

The following data was retrieved from the Vermont Department of Environmental Conservation's Spill List.

History of Occurrences:

Date	Event	Location	Extent
10/16/2012	Drum of unknown petroleum found on riverbank, and leaking. Likely deposited by flooding on 08/28/2011	Route 100 South, across from Riverbend Farm	55 gallon drum (exact quantity leaked unknown)
07/09/2012	Drum of unspecified petroleum and 2 compressed gas cylinders found. Likely deposited during Tropical Storm Irene flooding.	Route 100, Tupper Terraces	55 gallon drum (exact quantity leaked unknown)
09/05/2011	Transformer oil release onto concrete and into soil by Central Vermont Public Service (CVPS), now Green Mountain Power.	Peavine Drive	10 gallons released

Date	Event	Location	Extent
09/04/2011	Drum of used motor oil spilled during Tropical Storm Irene flooding, leaving contaminated sediments all over floor.	Route 100, at VTrans Garage	55 gallon drum
07/22/2008	Oil in holding tank of wastewater treatment facility. Isolated tank from others and removed oil with pads.	Rochester Wastewater Treatment Facility	Unknown.
05/08/2007	Drum rusted through and leaked onto ground. Site in proximity of tributary to White River.	Fiske Road, Quarry Hill	Unspecified. Likely a 55 gallon drum.
09/25/1996	Gasoline found in monitoring well.	Main Street, Parrish Station	Unknown.
01/24/1993	Spill occurred due to broken pipe connection on kerosene tank.	Fiske Road	500 gallons

Although no major spills consisting of hundreds of gallons of hazardous material have occurred in the Town of Rochester, the potential for a major spill exists. The major highway along the eastern side of the Green Mountains is Vermont Route 100. Route 100 generally runs north through the Town of Rochester for 8.3 miles, entering in the southeastern corner and extending up to the upper-northwest portion of the Town. Therefore, the majority of hazardous materials transported through the area by tractor trailer occur along Route 100. The Village of Rochester has been built up along Route 100, creating the potential for a larger population and more infrastructure to be heavily impacted by a hazardous materials spill in or nearby the village center.

Route 73 intersects Route 100 in the Town of Rochester, just north of the village of Talcville, Vermont. Beginning at Route 74 near the Ticonderoga-Larrabees Point Ferry to New York, Route 73 travels east-west through the southern part of the Green Mountains before ending in the Town of Rochester. Approximately 9 miles of Route 73 is located within the Town of Rochester. With the exception of Route 125, Route 73 is one of the only east-west routes in the Rochester-Stockbridge- Pittsfield area. Therefore, it can be expected that trucks carrying hazardous materials into Rochester from the west will use Route 73. While much of the length of Route 73 in Rochester passes through the Green Mountain National Forest, a spill throughout this corridor could impact those living along Route 73 and east-west travel in the region.

In order to prepare for hazardous material spills in Rochester, all members of the Rochester Fire Department have up-to-date HAZMAT Awareness Level training. Additionally, some members are trained to the HAZMAT Operations Level. The last Operations training Fire Department that members participated was in 2010.

Hazard	Location	Vulnerability	Extent	Estimated/Potential Impact	Likelihood/Probability
Hazardous Materials Spill	Route 100 and 73 corridors	Road infrastructure, nearby structures,	Initially, local impacts only; but depending on material spilled, extent	There are 276 residential and 65 commercial, industrial or public buildings within 1,000 feet of a potential HAZMAT spill on	Occasionally

		Rochester Village	of damage may spread (ex. into groundwater)	Route 100 and Route 73. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$2,796,960.	
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5. 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. Additionally, groundwater contamination from another distant source could 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 has been copied from the Hazard Materials Spill discussed above because the spilling of any hazardous materials also has the potential to contaminate the water supply for the town of Rochester.

History of Occurrences:

Date	Event	Location	Extent
10/16/2012	Drum of unknown petroleum found on riverbank, and leaking. Likely deposited by flooding on 08/28/2011	Route 100 South, across from Riverbend Farm	55 gallon drum (exact quantity leaked unknown)
07/09/2012	Drum of unspecified petroleum and 2 compressed gas cylinders found. Likely deposited during Tropical Storm Irene flooding.	Route 100, Tupper Terraces	55 gallon drum (exact quantity leaked unknown)
09/05/2011	Transformer oil release onto concrete and into soil by Central Vermont Public Service (CVPS), now Green Mountain Power.	Peavine Drive	10 gallons released
09/04/2011	Drum of used motor oil spilled during Tropical Storm Irene flooding, leaving contaminated sediments all over floor.	Route 100, at VTrans Garage	55 gallon drum

Date	Event	Location	Extent
07/22/2008	Oil in holding tank of wastewater treatment facility. Isolated tank from others and removed oil with pads.	Rochester Wastewater Treatment Facility	Unknown.
05/08/2007	Drum rusted through and leaked onto ground. Site in proximity of tributary to White River.	Fiske Road, Quarry Hill	Unspecified. Likely a 55 gallon drum.
09/25/1996	Gasoline found in monitoring well.	Main Street, Parrish Station	Unknown.
01/24/1993	Spill occurred due to broken pipe connection on kerosene tank.	Fiske Road	500 gallons

The Village of Rochester has a public water system, the Rochester Water Supply System, which currently has about 180 connections and serves approximately 440 people. As a requirement of Vermont state law, the Rochester Water Supply System has developed a Wellhead Protection Plan. It was last amended on June 25, 2012. In the Wellhead Protection Plan, the potential sources of contamination are identified, as well as the actions that have been taken to minimize the risk of groundwater contamination. The Town's water supply well is located 216 feet away from Vermont Route 100, and it is recognized that the proximity of the well to Route 100 creates the potential for contamination in the event of a hazardous materials spill.

A Wellhead Protection Area has also been established. It 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 Rochester's Wellhead Protection Area 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 Route 100, demonstrates the threat of contamination facing the Rochester Water Supply System's wellhead, despite their well-intentioned efforts.

Private well contamination also threatens those residents and business owners who are not located in the village of Rochester, and maintain their own well for drinking water. As private wells are not required to develop a Wellhead Protection Plan or Wellhead 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 of Rochester 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	Estimated/Potential Impact	Likelihood/Probability
Water Supply Contamination	Village of Rochester, private homes and businesses located throughout the Town.	Approximately 440 people connected to the Rochester Water Supply 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. 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 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

VI. Mitigation

A. Excerpted Town Plan Goals & Objectives Supporting Local Hazard Mitigation

- To protect the quality of the White River and West Branch. (page 7)
- To consider the needs and capacities of the school system, fire department, rescue squad and law enforcement in our planning efforts. (page 7)

The Rochester Town Plan is expected to be updated in 2013, and will have a 5 year lifespan.

B. 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

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).

work together to provide assistance and resources to towns interested in pursuing hazard mitigation projects.

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, Rochester's need 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.

Strategies given a "High" prioritization indicate that 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 of Rochester understands that in order to apply for FEMA funding for mitigation projects that a project must meet more formal FEMA benefit cost criteria. The Town must have a FEMA approved Hazard Mitigation Plan as well.

The following strategies will be incorporated into the Town of Rochester's long-term land use and development planning documents. In addition, the Town 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 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.

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
All hazards	<i>Continue to work with Red Cross on maintaining operations of Emergency Shelter.</i>	Selectboard	Medium	Local resources/ Red Cross resources	1-3 years
	<i>Utilize social media to alert the public to hazards and hazardous situations.</i>	Selectboard/ Fire Department	Medium	Local resources	1-3 years
Flooding; Severe Weather	<i>Continue consideration to strengthen floodplain management/flood hazard regulations.</i>	Planning Commission	Medium	Local resources, with TRORC assistance, municipal planning grants	1-3 years

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
Flooding; Severe Weather	<i>Upgrade culvert at Brook Street Brook and Cushman Road.</i>	Selectboard/ Road Commissioner	Medium	Structures grants, HMGP-C, local resources	2-4 years
	<i>Upgrade culvert at Brook Street Brook and North Hollow Road.</i>	Selectboard/ Road Commissioner	High	Structures grants, HMGP-C, local resources	1-4 years
	<i>Upgrade culvert at Wing Brook and Maple Hill Road.</i>	Selectboard/ Road Commissioner	High	Structures grants, HMGP-C, local resources	1-4 years
	<i>Upgrade culvert at River Brook Drive.</i>	Selectboard/ Road Commissioner	Low	Structures grants, HMGP-C, local resources	2-5 years
	<i>Seek out and attend NFIP trainings offered by the State.</i>	Selectboard	Medium	Local resources	1-3 years
Severe Weather (wind); Extreme Cold/Snow/Ice Storm	<i>Clear and maintain town road rights-of-way, and work with local utilities to ensure that utility corridors are cleared and maintained.</i>	Selectboard/ Highway Department	Medium	Local resources/ highway budget	Yearly/1 year
Extreme Cold/Snow/Ice Storm	<i>Continue to plan for, budget and maintain town roads for safe winter travel.</i>	Selectboard/ Highway Department	High	Local resources	Yearly/1 year
	<i>Create list/plan and identify town residents who are vulnerable to severe winter weather, including freezing temperatures and power outages.</i>	Fire Department	High	Local resources	Yearly if necessar y/ 1-2 years
Hazardous Materials Spill	<i>Seek out and attend Operations training for members of the Fire Department.</i>	Fire Department	Medium	Local resources	1-2 years
	<i>Survey fuel oil tanks for proper anchoring or the need for improved anchoring.</i>	Fire Department	Low	Local resources and individual property owners	4-5 years

Hazard(s) Mitigated	Mitigation Action	Local Leadership	Prioritization	Possible Resources	Time Frame
Hazardous Materials Spill; Water Supply Contamination	<i>Acquire additional containment booms and spill containment equipment.</i>	Fire Department	Low	Local resources	4-5 years
Water Supply Contamination	<i>Continue to maintain and update Wellhead Protection Plan.</i>	Water System Operator	Low	Local resources	4-5 years

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
1 = <i>Unlikely</i> <1% probability of occurrence in the next 100 years 2 = <i>Occasionally</i> 1–10% probability of occurrence per year, or at least one chance in next 100 years 3 = <i>Likely</i> >10% but <100% probability per year, at least 1 chance in next 10 years 4 = <i>Highly Likely</i> 100% probable in a year	1 = More than 12 hours 2 = 6–12 hours 3 = 3–6 hours 4 = None—Minimal	1 = <i>Negligible</i> Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries 2 = <i>Minor</i> Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries 3 = <i>Moderate</i> Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities 4 = <i>Major</i> Severe property damage on a metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

Appendix B: Critical Stream Crossings

This critical crossings table 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	INV_FIPS	CATEGORY	STRUCTYPE	STRC_LBL	X_COORD	Y_COORD
MARSH BROOK RD		27075	C			-72.7981	43.9084
BROOK ST	401415001714151		O B	TS	B17	-72.8051	43.8751
MARSH BROOK RD	401415001914151		O B	TS	B19	-72.8123	43.9058
CORPORATION RD	101415002514151		O B	TL	B25	-72.8484	43.844
QUARRY HILL RD	401415002614151		O B	TS	B26	-72.8198	43.8979
W HILL RD	101415002814151		O B	TL	B28	-72.8992	43.853
BEANS BRIDGE RD	101415002914151		O B	TL	B29	-72.8103	43.8843
BINGO RD	101415003114151		O B	TL	B31	-72.8849	43.8715
BINGO RD	101415003214151		O B	TL	B32	-72.8773	43.8651
BINGO RD	101415003314151		O B	TL	B33	-72.9249	43.8797
RIVER BROOK DR	101415003414151		O B	TL	B34	-72.8087	43.8774
LIBERTY HL	101415003514151		O B	TL	B35	-72.8004	43.8387
STATE GARAGE RD	101415003614151		O B	TL	B36	-72.806	43.8585

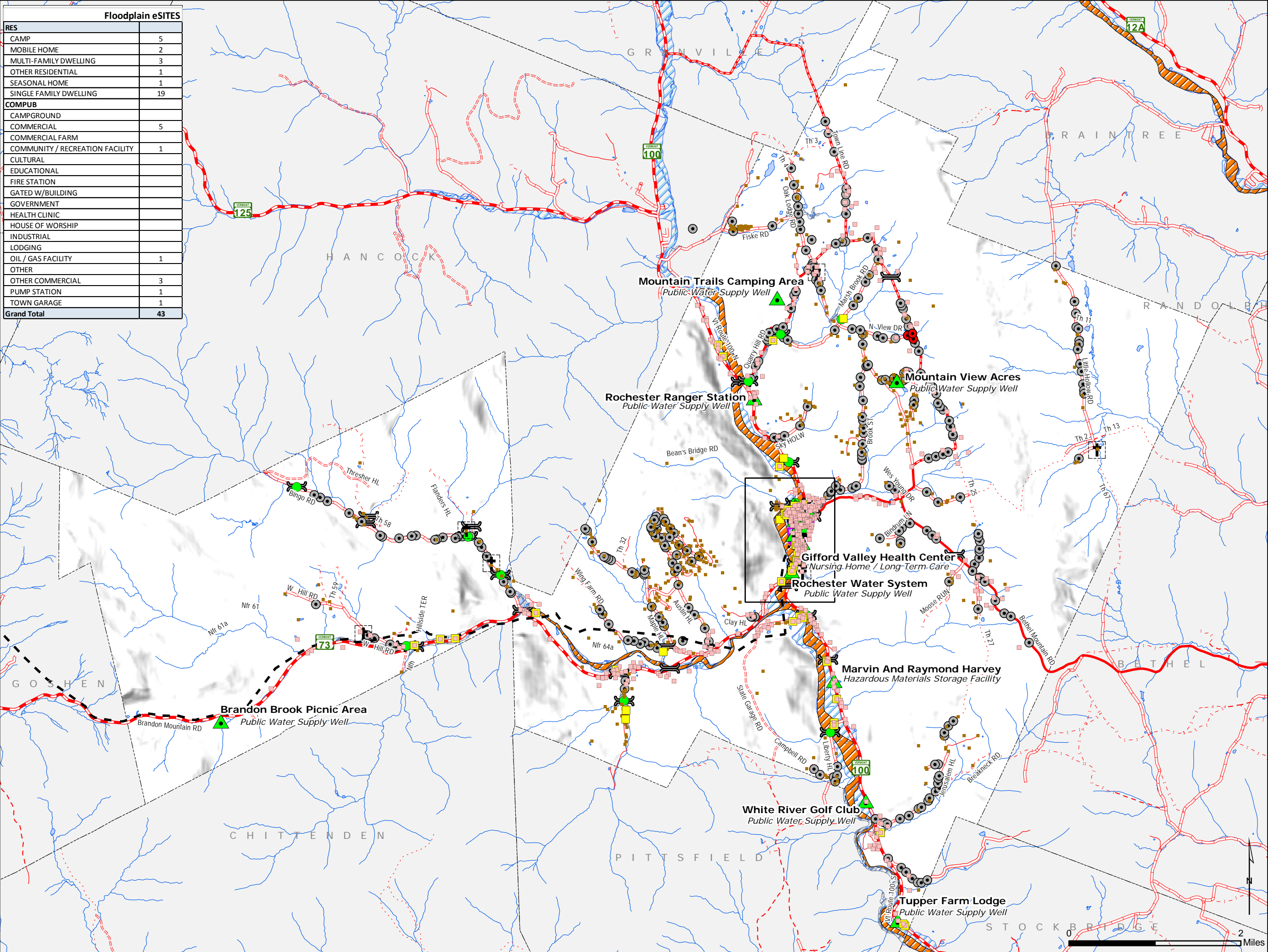
The critical crossings in the table below includes significantly undersized structures, usually culverts, which were identified from the ANR-DEC stream geomorphic assessment survey with openness ratios less than 50%. This measure refers to when structure's width is less than half of the stream bankfull 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	CATEGORY	STRUCTYPE	STRC_LBL	X_COORD	Y_COORD	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	AOTSTRUCT	OpennessR	ChannelWid
N View DR	C			-72.7827	43.9057	3	3	29		0.233103	4
N Hollow RD	C			-72.7814	43.9051	2	2	25		0.16	5
N Hollow RD	C			-72.7816	43.906	3	3	43		0.23814	12

Attachments

Attachment A: Maps of the Town of Rochester

Floodplain eSITES	
RES	
CAMP	5
MOBILE HOME	2
MULTI-FAMILY DWELLING	3
OTHER RESIDENTIAL	1
SEASONAL HOME	1
SINGLE FAMILY DWELLING	19
COMPUB	
CAMPGROUND	
COMMERCIAL	5
COMMERCIAL FARM	
COMMUNITY / RECREATION FACILITY	1
CULTURAL	
EDUCATIONAL	
FIRE STATION	
GATED W/BUILDING	
GOVERNMENT	
HEALTH CLINIC	
HOUSE OF WORSHIP	
INDUSTRIAL	
LODGING	
OIL / GAS FACILITY	1
OTHER	
OTHER COMMERCIAL	3
PUMP STATION	1
TOWN GARAGE	1
Grand Total	43



Hazard Mitigation Plan

Essential Services Map

Rochester, Vermont

- TH cls 1 (village VT rt)
- TH cls 2
- TH cls 2 gravel
- TH cls 3
- TH cls 3 gravel
- TH cls 4 gravel
- TH cls 4 primitive
- TH cls 4 impassable
- VT forest hwy
- trail
- private
- VT route
- US route
- US interstate
- Critical Facility
- Church
- Cemetery
- e911 in Floodplain
- e911 Within 1000' of Major Route
- e911 Address
- Critical Stream Crossing
- Culverts Under 18" Wide
- Significantly Undersized Structure
- Bridge
- Electric Transmission
- Village Center
- 500 Year
- 100 Year
- Floodway
- Village Inset Map

Flood Region:
Digitized from USDA Soil Conservation Service,
Tunbridge Flood Management Study
January 1991

Stream Geomorphic Assessment Data:
Obtained from the Data Management Sys.
Maintained by the VANR
River Management Program

Village Centers:
Designated by the State for,
historic tax credit and other benefits,
pursuant to 24 VSA sections 2793a

TWO RIVERS-OTTAUQUECHEE
REGIONAL COMMISSION

GIS Service Center
128 King Farm Rd
Woodstock, VT 05091
802-457-3188

trorc.org

