Annex #9 – Town of Waterville
Local Hazard Mitigation Plan
Adoption pending approval from FEMA received January 7, 2015
Adopted by the Selectboard March 2, 2015
Plan expires October 26, 2017

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Resolution

Approving the Waterville Local Hazard Mitigation Plan and Lamoille County Regional All-Hazard Mitigation Plan

The Selectboard of the Town of Waterville find that:

A) The adoption of a multi-hazard plan is required as a condition for communities to remain eligible for future Federal Emergency Management Agency (FEMA) mitigation grant funds.

B) The Town of Waterville has prepared the Waterville Local Hazard Mitigation Plan as an annex to the Lamoille County Regional All-Hazard Mitigation Plan in order to meet FEMA’s funding requirement, a copy of which is attached and incorporated herein by reference.

C) The Selectboard has reviewed and considered the Waterville Local Hazard Mitigation Plan and Lamoille County Regional All-Hazard Mitigation Plan.

D) The mitigation strategies and actions identified in the plan will be implemented as outlined in the Plan.

NOW THEREFORE,

BE IT RESOLVED BY THE SELECTBOARD OF THE TOWN OF WATERVILLE, A MUNICIPALITY OF THE STATE OF VERMONT, AS FOLLOWS:

Section 1. Based on the above findings, which are hereby adopted, the Waterville Local Hazard Mitigation Plan and Lamoille County Regional All-Hazard Mitigation Plan attached is approved as the official Multi-Hazard Mitigation Plan for the Town of Waterville.

Section 2. This resolution shall become effective immediately upon adoption.

The foregoing Resolution is hereby adopted this 2th day of March, 2015

Selectboard Chair

Selectboard Member

Selectboard Member

Town Clerk received 03-02-2015
1. Introduction and Purpose

1.1 Introduction

This Annex, when used with the appropriate sections of the Lamoille County Regional All-Hazard Mitigation Plan (RHMP), forms a comprehensive Local Hazard Mitigation Plan (LHMP) for the Town of Waterville. The plan has been reviewed, amended, and updated in its entirety to reflect changes in development, progress in local mitigation efforts, and changes in priorities since the adoption of the original plan in 2005.

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this plan is to provide all-hazards local mitigation strategies that make Waterville more disaster resilient.

Hazard mitigation is defined as any sustained action that reduces or eliminates long-term risk to lives and property resulting from the effects of natural and human-caused hazards. Based on the results of previous Project Impact efforts, FEMA, state, regional, and local agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities have opportunities to identify mitigation strategies and measures during each phase of Emergency Management-Preparedness: Response, Recovery and Mitigation. Hazards cannot be eliminated, but it is possible to identify what the local hazards are, where the hazards are most severe, and what local actions that can be taken to reduce the severity of incidents.

Hazard Mitigations Strategies and Measures alter the hazard by eliminating or reducing the frequency of occurrence, avert the hazard by redirecting the impact by means of a structure or land treatment, adapt to the hazard by modifying structures or standards, or avoid the hazard by stopping or limiting development and could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying and modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Proactive land use planning for floodplains and other flood-prone areas
- Proper road maintenance and construction
- Ensuring critical facilities are safely located
- Buyout and relocation of structures in harm’s way
- Establishing and enforcing appropriate building codes
- Dissemination of public information
1.2 Purpose

The purpose of this Local Hazard Mitigation Plan (LHMP) is to assist the Town of Waterville in identifying all hazards facing the community and in developing strategies to begin reducing risks from these identified hazards.

1.3 Planning Process

Since the adoption of the original LHMP in 2005, staff from LCPC and the town remained involved in the plan maintenance process through communication and support in the regular Local Emergency Planning Committee 11 (LEPC) meetings, participation in emergency response trainings and exercises (e.g. NIMS, LCERT), and actual hazard/disaster response and post event evaluation.

LCPC initiated the update of the RHMP and local annexes for each town in the county in 2009. Early in the process, the draft RHMP was posted on LCPC’s website and public comment was invited through announcement in the quarterly-edited LCPC newsletter. Notice of this opportunity was mailed to area businesses, Johnson State College, Copley Hospital and sent to each of the respective towns, along with a copy of their draft local annex.

LCPC also conducted a formal review of the Waterville LHMP in 2009 and worked with the town’s Emergency Management Director (EMD) to discuss the plan, assess changes in development trends, update progress in local mitigation efforts, and adjust mitigation priorities accordingly. To further engage the town, LCPC sent a letter detailing the plan development process and a copy of the partially updated LHMP, including emergency planning maps, to the EMD. The EMD distributed the information and coordinated a meeting with members of the Road Crew, Selectboard and other town officials to discuss the various hazards that affect the community.

Next, LCPC held a follow-up meeting with the Town Selectboard Chair, Emergency Management Coordinator, and Town Clerk to re-evaluate each section of the plan to confirm its continued accuracy and applicability. This review included the addition of new mitigation goals and strategies; evaluating progress made on goals and strategies in the previous local hazard mitigation plan; as well as updates to the town’s recent hazard history.

In December 2010, the draft LHMP was submitted to the State Hazard Mitigation Officer for review and sent to FEMA Region I for conditional approval later that month. Upon receipt of comments from FEMA Region 1 in August 2011, LCPC met with the Waterville Planning Commission– which holds monthly public meetings– to review mitigation priorities in the wake of the unprecedented flooding that impacted Vermont in the spring and late-summer of 2011. Each event triggered a federal disaster declaration for multiple counties across the state, including Lamoille (DR-1995 and DR-4022 respectively). In fall 2011, a revised draft of the Waterville LHMP Annex was posted on the LCPC website to invite public comment, where it remains to this date. Comments are accepted on an ongoing basis. The LHMP was re-evaluated throughout December 2012 – March 2013 in preparation for submission to FEMA. Concurrent with final updates of all ten local annexes, LCPC also invited public comment with notices in
local Town Clerk’s offices and advertisements in the Stowe Reporter and News & Citizen – the newspapers of record in Lamoille County. Copies of each LHMP were made available to interested residents at LCPC’s offices in Morrisville and in the respective Town Clerk’s offices.

Feedback received from the public, public officials, businesses, and emergency management officers was incorporated into the plan all stages. Gathering oral histories, prioritizing hazards and mitigation strategies, and discussing where the public needs are most relevant was used to form this plan. Without that input and support the plan would be lacking a crucial element and motivation for mitigation.

In addition to public input, information was utilized from the following sources:
- State of Vermont Hazard Mitigation Plan
- Regional All-Hazards Mitigation Plan
- Vermont Agency of Transportation
- Vermont Division of Emergency Management and Homeland Security
- Vermont Center for Geographic Information
- Waterville Municipal Plan 2009-2014
- Waterville Basic Emergency Operations Plan
- Emergency Response Guidebook
- Flood Insurance Rate Maps
- American Community Survey 2005-2010
- U.S. Census, 2010

After submitting the revised version in May 2013, the plan received conditional approval from FEMA Region I on **DATE**, pending adoption by the Waterville Selectboard. The Selectboard reviewed the final draft and adopted the plan **DATE**.

2. Community Background

Waterville is a rural residential community. The town is located in a small, low-lying valley between the steep hills and mountains, and is situated in the northwestern section of Lamoille County. It is bounded by Bakersfield on the north and west, Cambridge on the south, Belvidere and Johnson on the east and Fletcher and Cambridge on the west. The town has a planning board and a town plan. It has no zoning or subdivision regulations and does not participate in the NFIP. Vermont Route 109 is the only state highway in Waterville, which bisects the town and serves as the primary connection to Eden and Route 100 to the northeast and Cambridge and Route 108 to the west.

The main village center is located on Route 109. The population of Waterville has decreased from 697 in 2000 to 673 in 2010. This represents a population loss of approximately 3.4 percent over the last decade, in comparison to the 50 percent population increase from the previous 20 years. As of 2010, Waterville had 310 total housing units, including 242 single unit detached (78%) and 60 mobile homes (19%).
Due to the fact that the Town of Waterville does not require building permits, it is difficult to determine what share of new housing activity observed during the 2000s took place after the previous LHMP was adopted in 2005. Anecdotally, the economic recession of the late-2000s and ongoing volatility of the national housing market have depressed new construction for much of the last five years. While Waterville’s population reflected an overall decline, there have been no substantial changes in development patterns that would necessitate a major shift in mitigation priorities.

There is no town-supported water supply in Waterville, with most houses relying on individual springs or wells. The Waterville Water cooperative serves 22 houses in the village between the school and Nellie Chase house, drawing from an aquifer above the Nazarene Church. The Vermont Electric Cooperative, Inc., supplies electric service in Waterville. The Village of Enosburg Falls Electric Department shows a portion of its service area in Waterville, though the area is unpopulated and thus, there are no connections. There are local energy sources available, with wood being the most notable. Other energy sources are available through private companies.

Waterville shares emergency response services with nearby municipalities. Fire and rescue coverage is provided primarily by the Johnson Fire Department and Rescue Squad, which covers the towns of Johnson, Waterville, and Belvidere. The fire station is located on Route 15 in Johnson. Medical care is provided by Copley Hospital in Morrisville, a full service community hospital for acute, outpatient and long-term care. More specialized services are available in Burlington, Berlin, and Lebanon, New Hampshire. Other outpatient care is available at community clinics in neighboring towns. Waterville contracts with the Lamoille County Sheriff’s Office for 911 emergencies. The sheriff’s department then dispatches the appropriate service. Ambulance service is provided by Northern Emergency Rescue Service and the Cambridge Rescue Squad. Police service is provided by Vermont State Police.

The town has a Rapid Response Plan (RRP) and a Basic Emergency Operations Plan (BEOP), which was adopted on September 18, 2012. A preliminary hazard/vulnerable site analysis identifies the Waterville Elementary School as a high a risk population. Essential facilities identified in the RRP include the Town Offices and the Waterville Elementary School for an emergency operations center and the Waterville Elementary School and Town Hall as community shelters. There are also several bridges and buildings of historical interest.

The rural character of the town makes it necessary to have an automobile or other vehicle for transportation. The town of Waterville is unique in that the transportation infrastructure leading into and out of the town is essential in disaster/emergency response. During flooding events, the town can essentially become an island as all routes in the town have the potential to be under water. Route 118 from the northeast floods around the intersection with Route 109; Route 109 floods in Waterville; Hogback Road from Johnson is prone to flooding as well. The only other route into Waterville is Plot Road from Johnson, which is a Class 3 road that can be difficult for emergency vehicles to traverse during winter and mud season.
2.1 Previous FEMA-declared natural disasters

Since 1990 Waterville has received public assistance funding from FEMA for the following natural disasters:

- January 1996 (DR 1101) $4,965
- July 1997 (DR 1184) $15,713
- July 1998 (DR 1228) $18,766
- August 2004 (DR 1559) $19,911
- July 2008 (DR 1784) $11,860
- May 2012 (DR-4066) $63,000

**January 1996**: Mid-winter flood event brought statewide destruction of private and public property with eleven Vermont counties included in the declared disaster area. This event left more than 150 communities eligible for public assistance (FEMA-1101-DR-VT).

**July 1997**: Excessive rain in several northern Vermont counties caused flash flooding and destruction of public and private property (FEMA-1184-DR-VT). High velocity waters damaged many roads in Belvidere.

**July 1998**: Eleven of the fourteen Vermont counties experienced severe damage from excessive rainfall (FEMA-1228-DR-VT). The torrential rains came in much the same pattern as they had in the summer of 1997, but occurred further south than the 1997 floods. The flash flooding left many homes destroyed, roads and bridges damaged, and communities cut off from the rest of the state. Waterville suffered flood damage to road surfaces, culverts and ditches.

**August 2004**: (FEMA-1559-DR-VT): Severe thunderstorms on August 12, 29 and 30 caused flooding and washed out roads. A federal disaster was declared in Addison, Caledonia, Chittenden, Franklin, Lamoille, Orleans and Windham counties. The Town of Waterville received more than $19,911 in federal share funds for public assistance projects related to debris removal, brush cutting and chipping.

**July 2008**: (FEMA-1784-DR-VT): Severe storms (tornado) and flooding struck Waterville on July 18th. A federal disaster was declared on August 15, 2008. Waterville received $1186066 in federal public assistance funds to repair damage and debris removal resulting from a tornado.

**May 29, 2012**: Flash flooding, thunderstorms, heavy rain, and strong winds struck parts of Vermont, including Lamoille County, causing a federal disaster declaration (DR-4066) for Addison, Lamoille, and Orleans counties. Public Assistance funds were allocated to repair roads, bridges, and culverts. Waterville received $63,000 in Public Assistance funds for six road and highway projects.

3. Waterville Hazard Inventory / Vulnerability Assessment

The following assessment is based on the revised, 2007 State of Vermont HI/RA and Section 2 of the amended RHMP. The first column is a list of possible hazards that could affect the
community. The hazards were evaluated to have a Rare, Unlikely, Unusual, Likely, or Frequent frequency of being a threat to the community.

The **FREQUENCY** of occurrence is classified as shown:

- Rare: < 1% probability in the next 100 years; may never have occurred in Vermont.
- Unlikely: 1% to 4% probability in the next year, this type of event has occurred in Vermont.
- Unusual: 4% to 10% probability in the next year, or at least one chance in the next 100 years.
- Likely: 10% to 50% probability in the next year, or at least one chance in the next 10 years.
- Frequent: Greater than 50% probability in the next year; an event that occurs often but degree varies.

The **SEVERITY** (percentage of the community affected) of the hazard can be classed as follows:

- Minor: < 10% of properties damaged/Minimal disruption to quality of life.
- Serious: 10% to < 25% of properties damaged/Loss of essential facilities/services for up to 7 days/Few (< 1% of population) injuries possible.
- Extensive: 25% to 50% of properties damaged/Loss of essential facilities/services for > 7 days < 14 days/Major (< 10% of population) injuries/few deaths possible.
- Catastrophic: > 50% of properties damaged/loss of essential facilities/services for > 14 days/Severe (> 10% of population) injuries/multiple deaths possible.

The combination of the impact of the hazard (severity) and the frequency was used to determine the **COMMUNITY VULNERABILITY/RISK** as **High, Moderate or Low**.

The **WORST THREATS** to the community are designated with an asterisk *. The worst threats are those hazards with threats that have (a) frequent possibility of occurrence, and/or (b) catastrophic or extensive impact to your community.

3.1 Waterville HI/RA Matrix
Table I. Waterville HI/RA

<table>
<thead>
<tr>
<th>Possible Hazard</th>
<th>Frequency</th>
<th>Severity</th>
<th>Extent of Damage**</th>
<th>Community Vulnerability/ Risk</th>
<th>Most vulnerable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood inundation and flash floods*</td>
<td>Frequent</td>
<td>Catastrophic</td>
<td>Measured using the Jeffersonville Flood Gage of the Lamoille River.</td>
<td>High</td>
<td>Damage to roads, culverts, bridges, residences, and public facilities; potential water source contamination</td>
</tr>
<tr>
<td>Winter storms and ice storms*</td>
<td>Frequent</td>
<td>Extensive</td>
<td>Notable to Crippling</td>
<td>High</td>
<td>Property damage, road closures, loss of electricity from fallen trees, infrastructure damage, debris removal</td>
</tr>
<tr>
<td>Windstorms, incl. hurricanes and tropical storms*</td>
<td>Likely</td>
<td>Serious</td>
<td>Saffir-Simpson Scale Category 1, Beaufort Scale 8 or 9, Flood Gage reaching 450 feet</td>
<td>Moderate</td>
<td>Road closures and loss of electricity from fallen trees; other vulnerabilities associated with flooding</td>
</tr>
<tr>
<td>Structure Fire</td>
<td>Likely</td>
<td>Serious</td>
<td>Incipient to Growth stages; depends on age of structure</td>
<td>Moderate</td>
<td>Spread of fire through the Village Center (concentration of population centers) and housing complexes</td>
</tr>
<tr>
<td>Major highway and railroad accidents</td>
<td>Likely</td>
<td>Serious</td>
<td>Minimal</td>
<td>Moderate</td>
<td>Along state routes 109</td>
</tr>
<tr>
<td>Major wildfire/forest fire</td>
<td>Unusual</td>
<td>Extensive</td>
<td>Decay stage</td>
<td>Moderate</td>
<td>Widespread damage to structures and natural resources</td>
</tr>
<tr>
<td>Drought</td>
<td>Unusual</td>
<td>Serious</td>
<td>Degree and duration of meteorological dryness</td>
<td>Moderate</td>
<td>Private well failures, wildfires, agricultural losses</td>
</tr>
<tr>
<td>Tornado</td>
<td>Unusual</td>
<td>Serious</td>
<td>F1 or F2</td>
<td>Low</td>
<td>Road closures and loss of electricity from fallen trees; major structure damage</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Unlikely</td>
<td>Serious</td>
<td>Micro to Light (0 – 4.9)</td>
<td>Low</td>
<td>See VT Geological Survey HAZUS report (9/03)</td>
</tr>
<tr>
<td>Major hailstorm</td>
<td>Unlikely</td>
<td>Minor</td>
<td>2.00 in magnitude</td>
<td>Low</td>
<td>Damage to structures and other public and private property</td>
</tr>
<tr>
<td>Hazardous materials spill</td>
<td>Unusual</td>
<td>Extensive</td>
<td>Amount, seepage depth</td>
<td>Low</td>
<td>Expenditures to residences and general population</td>
</tr>
<tr>
<td>Landslide</td>
<td>Unusual</td>
<td>Minor</td>
<td>Richter scale; Beaufort scale; rainfall</td>
<td>Low</td>
<td>Damage to roads and structures</td>
</tr>
</tbody>
</table>

*Consistently significant hazards in Lamoille County

**Extent of damage measured using the following sources from the International Fire Service Training Center and National Climactic Data Center: Northeast Snow Impact Scale, Fujita Scale, and Richter Scale and based on the frequency, severity, and risk to the community using past trends.
3.2 Community Vulnerability Analysis by Hazard

Based on the results of interviews with local residents, a Hazard Questionnaire conducted during the 2005 planning development process, the history of disasters in town, and the Waterville HI/RA, the following hazards were identified consistently as significant threats to the community:

- Flood Inundation and Flash Flooding
- Windstorms
- Winter Storm/Ice Storm

Each of these threats has the potential to cause power outages, which may place lives and property in damage, especially during winter months. Overall, interviews indicate that the following hazards are listed as Likely, Frequent or Unusual in terms of **Frequency**: Winter Storm/Ice Storm, Flood Inundation and Flash Floods, Structure Fire, High Wind, Dam Failures and Highway-Transportation Accidents. In terms of **Severity**, the town rated these hazards as Catastrophic or Extensive: Flood Inundation and Flash Flood, Winter Storm/Ice Storm, Wildfire/Forest Fire, Hazardous Materials, Dam Failures.

The paragraphs below expand upon local vulnerabilities identified in the Waterville HI/RA. For a complete analysis of potential hazards facing the community refer to Section 2.4 of the RHMP.

**Flood Inundation and Flash Flooding**
The community vulnerability to a Flood is **High** based on the **Frequent** possibility (Near 100% probability in the next year) of an incident with the potential for **Catastrophic** (>50% of the community) impact.

Based on the results of utilizing GIS to overlay the digital FHBM with the location of structures in Waterville— which were GPS located for the development of the Enhanced 911 Emergency services dispatch system— nineteen (19) vulnerable locations were identified to have flood inundation potential, based on the 100-year floodplain. The estimated loss for damage to these properties was calculated by using the median housing value estimated by the 2005-2010 American Community Survey.

<table>
<thead>
<tr>
<th>Town</th>
<th>Median Housing Value</th>
<th>Structures in Floodplain (% of total)</th>
<th>Potential Flood Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterville</td>
<td>$162,800</td>
<td>19 (6.1)</td>
<td>$2,767,600</td>
</tr>
</tbody>
</table>

The Floodplain, Bridge and Culvert map (Tab a) identifies the areas of town that are within the 100-year floodplain. Generally, these include lands adjacent to the North Branch of the Lamoille River in southeastern Waterville. The Local Areas of Concern map (Tab c) identifies other areas of potential loss to infrastructure due to erosion and road flooding. Waterville historically has recorded numerous floods. Annual flood events are common in some form. Damage covers a wide range. The 1927 flood caused extensive damage in the community, including structural
damage, destruction of roads, bridges, railroad bed/bridges, and loss of crops and supply interruptions. The floods of 1984, 1995 and 1997 also caused significant damage. Roads, bridges, residences, and businesses along the North Branch of the Lamoille River have experienced repeated damage caused by flooding.

Floods are the most probable natural cause of emergencies or disaster in Waterville. High-elevation ponds and rivers have been one notable cause flooding in the past. Advance weather prediction is not always accurate and extreme precipitation can develop without adequate warning. Flooding, especially flash flooding, can impact areas in town that are located above designated floodplains. The mountainous areas in town are especially vulnerable to this phenomenon. Spring thaws and ice breakups may cause some lowland flooding. Summer or fall storms are more likely to be responsible for major flooding. Water contamination of private wells and springs is a potential problem during flood events. The town has no public water supply however the Village operates its own co-op and the well is monitored by Ross Environmental Associates out of Stowe.

National Flood Insurance Program

Waterville does not participate in the NFIP and thus has no repetitive loss properties. The town has no flood hazard bylaw and must have one in place in order for residents to apply for federally subsidized insurance. Historically, Waterville has elected not to enroll in NFIP due to the small extent of floodplain in the community and limited demand for flood insurance among residents. However, as of the fall 2011, LCPC is working with the Waterville Planning Commission to review the benefits and potential parameters associated with a flood hazard bylaw. These discussions are expected to be ongoing into 2014 as Waterville updates its town plan.

Winter Storm/Ice Storm

The community vulnerability to a Winter Storm/Ice Storm is High based on the Frequent (Near 100% probability in the next year) occurrence and the potential for Extensive (25% to 50% of the community) impact.

Winter storms with snow, ice, and freezing temperatures in various combinations are fairly commonplace in Waterville. The town is geared to handle most winter emergencies. A potential for emergency exists when such storms also result in the loss of electricity, leaving people without adequate heating capability. Heavy wet snows of early fall and late spring cause most power failures; however, ice storms can also cause power outages.

Due to the region’s mountainous terrain, it is not uncommon for precipitation to range from rain in the valley area to ice in the middle elevations with heavy snows in the higher terrain. This poses a major challenge to highway maintenance personnel. Waterville maintains snow removal equipment for all town highways, and Vermont Agency of Transportation maintains equipment for state highways. Snowfalls that are within normal snowfall limits are handled effectively; however, during heavy snowfall for extended periods of time, removal of snow becomes an issue. Historically, these events are not frequent and are short in duration. During such events, radio communications is maintained between highway crews and town emergency responders. Local construction equipment in the community has been used in the past to augment community
resources. Most residents are accessible during severe weather conditions, although access may be delayed. In the event of a winter emergency, the Highway Department will assist fire and ambulance crews by making private roads passable.

**Windstorms/High Winds**
Powerful windstorms represent a four-season hazard in Vermont. Impacts may vary from highly localized events, to storms causing widespread damage. These storms frequently damage structures, trees, and powerlines. In December 2010, a damaging windstorm in central and northwest Vermont led to a federal disaster declaration for Chittenden, Franklin, and Lamoille counties. Windstorms pose risk to the entire community.

Damaging winds and flooding may also be caused by hurricanes and tropical storms, which travel up the Atlantic coastline. While the risk to Vermont is not on par with the South Atlantic and Gulf Coast states, the associated rain and flooding caused by these storms has had devastating impacts locally. In 1938, a hurricane swept across New England, causing what was once cited as the worst flooding in the state’s history. In some regions, the 1938 hurricane was only recently eclipsed by the impact of Tropical Storm Irene, which devastated southern and central Vermont in August 2011 (Waterville was fortunate to have sustained minimal damage from Irene).

Windstorms and tropical storms can be measured using the following scales:

### Beaufort Scale

<table>
<thead>
<tr>
<th>Beaufort number</th>
<th>Wind Speed (mph)</th>
<th>Seaman's term</th>
<th>Effects on Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Under 1</td>
<td>Calm</td>
<td>Calm: smoke rises vertically.</td>
</tr>
<tr>
<td>1</td>
<td>1-3</td>
<td>Light Air</td>
<td>Smoke drift indicates wind direction; vanes do not move.</td>
</tr>
<tr>
<td>2</td>
<td>4-7</td>
<td>Light Breeze</td>
<td>Wind felt on face; leaves rustle; vanes begin to move.</td>
</tr>
<tr>
<td>3</td>
<td>8-12</td>
<td>Gentle Breeze</td>
<td>Leaves, small twigs in constant motion; light flags extended.</td>
</tr>
<tr>
<td>4</td>
<td>13-18</td>
<td>Moderate Breeze</td>
<td>Dust, leaves and loose paper raised up; small branches move.</td>
</tr>
<tr>
<td>5</td>
<td>19-24</td>
<td>Fresh Breeze</td>
<td>Small trees begin to sway.</td>
</tr>
<tr>
<td>6</td>
<td>25-31</td>
<td>Strong Breeze</td>
<td>Large branches of trees in motion; whistling heard in wires.</td>
</tr>
<tr>
<td>7</td>
<td>32-38</td>
<td>Moderate Gale</td>
<td>Whole trees in motion; resistance felt in walking against the wind.</td>
</tr>
<tr>
<td>8</td>
<td>39-46</td>
<td>Fresh Gale</td>
<td>Twigs and small branches broken off trees.</td>
</tr>
<tr>
<td>9</td>
<td>47-54</td>
<td>Strong Gale</td>
<td>Slight, structural damage occurs; slate blown from roofs.</td>
</tr>
<tr>
<td>10</td>
<td>55-63</td>
<td>Whole Gale</td>
<td>Seldom experienced on land; trees blown; structural damage occurs.</td>
</tr>
<tr>
<td>11</td>
<td>64-72</td>
<td>Storm</td>
<td>Very rarely experienced on land; usually with widespread damage.</td>
</tr>
<tr>
<td>12</td>
<td>73 or higher</td>
<td>Hurricane Force</td>
<td>Violence and destruction.</td>
</tr>
</tbody>
</table>

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**Saffir-Simpson hurricane wind scale**

<table>
<thead>
<tr>
<th>Category</th>
<th>Wind speeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five</td>
<td>≥70 m/s, ≥137 knots</td>
</tr>
<tr>
<td>Four</td>
<td>58-70 m/s, 113–136 knots</td>
</tr>
<tr>
<td>Three</td>
<td>43-49 m/s, 83–95 knots</td>
</tr>
<tr>
<td>Two</td>
<td>33-42 m/s, 64–82 knots</td>
</tr>
<tr>
<td>One</td>
<td>18–32 m/s, 35–63 knots</td>
</tr>
</tbody>
</table>

**Additional classifications**

- Tropical storm 39–73 mph, 63–118 km/h
- Tropical depression <38 mph, <62 km/h
Other Hazards

Major Highway and Railroad Accidents: The community vulnerability to a highway accident is Moderate based on the Likely (Near 100% probability in the next year) occurrence and the potential for Serious (few <1% of the population, injuries impact). Waterville is transected by VT Route 109, which serves as an inter-regional trucking and transportation corridor. Motorists travel at high speeds on the state highway network, creating potentially dangerous intersections with local roadways. The threat of a major highway accident is an ever-present possibility in communities across the United States. The threat of a major railroad accident is non-existent, as there are no active rail lines in Waterville.

Hail Storm: With Vermont’s variable weather patterns, hail is a four-season threat to both public and private property. While the likelihood of a severe hail storm is low, smaller storms may damage homes and automobiles. Hailstorms pose risk to the entire community.

Hazardous Materials (HAZMAT) Spill: In Vermont, businesses and facilities storing hazardous materials are required to file a report with Vermont Division of Emergency Management and Homeland Security (DEMHS) and their Local Emergency Planning Committee (LEPC), detailing the volume and type of substance (see Section 3.2.1). LEPCs receive funds from DEMHS to carry out planning and preparedness activities, including commodity flow studies to track the transport of hazardous substances and outreach to non-reporting HAZMAT storage sites. Hazardous material accidents are less likely but are of particular concern as Route 109 is a thruway for HAZMAT carriers and the proximity of critical facilities, schools and residences to the road creates potential for mass casualty incidents (more than 4 injured people) including motor vehicle accidents (particularly tour or school busses) where response agencies may be overburdened.

Structure Fire: The risk of large scale structure fires is moderate in Waterville. The most significant risks involve the village area and residences with long driveways that may prolong response time involved. Historically, structure fires have been isolated incidences, but they pose risk to the entire community. Mutual aid agreements with surrounding municipalities are in place for fire services.

Wild Forest Fire: Across much of Vermont, small wildland and brush fires are common, but the probability of major forest fire is very low. Peak wild fire season is in April, just after spring “green-up.” A second window of wildfire vulnerability typically occurs in early fall. Every town in Vermont has a designated Forest Fire Warden, who receives daily updates from the Division of Forestry during periods of elevated risk. The Division of Forestry also hosts annual Forest Fire Warden trainings at locations throughout the state. The risk of wildfires is most severe in outlying areas of development– away from the town’s major highways– where structures are surrounded by ignitable hard and softwood forests.

Drought: Droughts represent a hazard in late summer, when local spring and well levels are reduced to minimal flows. The local water table reached an all time low during the nationwide drought of 1988, however, recovery was fairly rapid. The town has no public water reservoirs if private wells go dry. Drought poses risk to the entire community.
Earthquake: According to the U.S. Geological Survey (USGS), the risk of earthquakes in Vermont and much of northern New England is rated moderate, compared with the high risk attributed to much of the West Coast and lower-Midwest. Lamoille County has not experienced any property damage or loss of life attributed to an earthquake in its history.

Landslides: The risk of a landslide is most often associated with flooding, erosion, and other impacts of heavy rain. Although landslides have caused property damage in the nearby Towns of Johnson and Cambridge in recent years, Waterville’s topography and rural development pattern leaves few homes and critical facilities exposed to the threat of a landslide.

Air crash: The potential for an air crash exists due to the proximity of the Morrisville-Stowe airport and the rugged terrain found in Waterville. The potential for development of the airport creates the possibility of larger aircraft to fly into town. Overall more training on this hazard is needed.

Impact of Power Shortage/Failure: One of the most common impacts of major natural disasters can be the prolonged loss of electricity, whether from localized damage to distribution systems or from remote impacts to generation and transmission facilities. Based on the rural character of the town and its concerns with transportation infrastructure in inclement weather, protracted loss of power could significantly endanger health and safety, have substantial economic consequences, or cause stress and severe inconvenience to the town’s residents and businesses. The shortage of energy and food supplies could threaten the welfare of the citizens of Waterville. The dependency upon out of state sources can become a problem when normal deliveries are interrupted. The VT Department of Health and Lamoille County Sheriff’s Department maintain a list of vulnerable populations who may require additional assistance during long term outages.

4.2.1 HAZMAT Sites

Data from the inventory maintained by LEPC #11 identifies no Tier II sites in the town of Waterville. A Tier II site is defined by federal law under the Emergency Planning & Community Right to Know Act (EPCRA) and is generally any facility which uses or possesses reportable quantities of chemicals requiring material safety data sheets by VOSHA, known human carcinogens, extremely hazardous substances, explosives which require licensing or certain threshold quantities of petroleum products.

According to the State’s Waste Management Interactive database, from 2005 to 2010 there were three incidents involving spills of #2 diesel/heating oil, kerosene, and hydraulic oil. As of November 2012, the following table lists the active waste sites in Waterville. This list includes petroleum as well as non-petroleum sites. Prior to database consolidation in 1991, different site numbering systems were used. In order to minimize confusion, the petroleum site numbering system was adopted. This system consists of a two or four digit prefix (year site was identified) and a four digit (site specific) number. All sites identified since January 1, 1991 have been consecutively numbered beginning with 91-1000. Sites identified prior to January 1, 1991, have
retained their previously assigned site identification numbers. Due to database requirements for a six digit site number, the non-petroleum sites identified prior to January 1, 1991 have a 77 prefix added to their previously assigned site identification numbers.

As of November 2012, the State’s Waste Management Interactive Database Lists the sites below:

Table III. Active Hazardous Waste Sites in Waterville (as of November 2012)

<table>
<thead>
<tr>
<th>Site#</th>
<th>Site Name</th>
<th>Address</th>
<th>Town</th>
<th>County</th>
<th>Priority</th>
<th>Discovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>20063486</td>
<td>Judevine Farm</td>
<td>4590 Plot Rd</td>
<td>Waterville</td>
<td>Lamoille</td>
<td>LOW</td>
<td>1/25/2006</td>
</tr>
<tr>
<td>921315</td>
<td>Waterville Garage</td>
<td>Main St</td>
<td>Waterville</td>
<td>Lamoille</td>
<td>MED</td>
<td>Unknown</td>
</tr>
<tr>
<td>951876</td>
<td>Waterville Wells</td>
<td>Route 109</td>
<td>Waterville</td>
<td>Lamoille</td>
<td>LOW</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

The State’s database lists no hazardous waste generators and one active underground storage tank facility location in the Town. The potential for severe pollution impacts to water quality and ecosystems exists from hazardous waste sites and/or from spills at facilities which use hazardous materials. Releases of hazardous materials from fixed site locations in Waterville are an Unusual occurrence.

The accompanying Areas of Local Concern map (Tab b) outlines the potential impact of a HAZMAT incident in terms of structures affected within a community from a fixed site and in terms of structures affected along a HAZMAT transportation corridor or route where an accident might occur.

When assessing community vulnerability, the impact of both fixed sites and transportation were considered. Using the Department of Transportation Emergency Response Guidebook, a 1,000 foot buffer was selected for fixed site facilities to determine the area of potential impact. For potential transportation incidents, a 500 foot buffer on each side of Class I and II roads was used to determine potential impact. In Waterville, there are no Tier II sites and thus no structures are within 1,000 feet of a Tier II site (Table III). Based on the median housing value for Waterville provided by the 2005-10 American Community Survey, the estimated potential loss for all properties within 500 feet of a major roadway is $11,736,400 (Table IV below).

Table IV. Waterville Potential Tier II Hazard Loss (fixed)

<table>
<thead>
<tr>
<th>Town</th>
<th>Median Housing Value</th>
<th>Structures within 1000’ of Tier II site (% of total)</th>
<th>Potential Tier II Hazard Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterville</td>
<td>$162,800</td>
<td>0 (0)</td>
<td>$0</td>
</tr>
</tbody>
</table>

Table V. Waterville Potential Tier II Hazard Loss (transportation)
<table>
<thead>
<tr>
<th>Town</th>
<th>Median Housing Value</th>
<th>Structures within 500’ of a major road (% of total)</th>
<th>Potential Tier II Hazard Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterville</td>
<td>$162,800</td>
<td>122 (37.0%)</td>
<td>$19,861,600</td>
</tr>
</tbody>
</table>

4.2.2 Transportation Hazards

No major intersections have been identified by the Vermont Agency of Transportation (VTrans) as having a history of accidents. A culvert study was conducted in 2004 and some culverts may fail during flooding events. Repair or replacement of culverts is almost always needed. LCPC is in the process of working with all of its member towns to update culvert inventories. All bridges located in town are identified on the Floodplain, Bridge and Culvert map (Tab a). Bridges with a federal sufficiency rating of less than 50 (out of 100) are also identified on the Areas of Local Concern Map (Tab b). Three (3) bridges in Waterville have a federal sufficiency rating of less than 50.

4.2.3 Areas of Local Concern

Although there are no Tier II sites in town, HAZMAT carriers do travel along Route 109 past the village, town offices, elderly housing, and the local school. There are five critical facilities in the town (Tab c), three of which are impacted by one known hazard. Known hazards include being within the 100-year floodplain, being within 500 feet of a major road, and being within 1,000 feet of a Tier II site (Tab b). Additional Areas of Local Concern include the Elementary School and Town Offices, which also serve as the town’s EOCs/emergency shelters, though neither has an emergency generator.

5. Mitigation Goals

5.1 Lamoille County Hazard Mitigation Goals

Goal 1: Implement State Hazard Mitigation goals as appropriate at the regional and local level.

Goal 2: Promote awareness of the relationship between the impacts of disaster events, land uses and infrastructure.

Goal 3: Encourage local hazard mitigation planning and projects.

Goal 4: Encourage municipalities to incorporate their Local Hazard Mitigation Plan (LHMP) into their municipal plan and bylaws.

Goal 5: Encourage municipalities to incorporate their LHMP projects into their municipal budget and/or capital plan and programs.

Goal 6: Plan and implement hazard mitigation projects.
Goal 7: Avoid land use investments in conflict with vulnerable areas.

5.2 Town of Waterville Hazard Mitigation Goals

The following goals were re-evaluated and re-affirmed by the local community as being valid and effective:

- Provide the technical support for, and aid in the development of, implementation protection mechanisms at the local level that will serve to avoid land use investments that would be, over time, endangered by, incompatible or in conflict with fluvial adjustment and erosion processes, and landslides
- Encourage hazard mitigation planning as a part of the Local Planning Process
- Endorse and support the implementation of the Lamoille County Hazard Mitigation goals

5.3 Planning and Development Guidelines that Support Hazard Mitigation

The current Waterville Town Plan was adopted on May 4, 2009. In a 2014 revision, Waterville integrated hazard mitigation planning efforts into its Town Plan goals and policies (Chapter VI: Local Services and Facilities). The town has not adopted zoning or subdivision regulations. In 1974, FEMA produced Flood Hazard Boundary Maps (FHBMs) for Waterville although to this point the town has elected not to enact a flood hazard bylaw. The Town Plan update process incorporated more awareness of hazards and what the community can do to improve resiliency. It also identified the following goals: consider adopting flood hazard regulations, install more dry fire hydrants to increase firefighting capacity in the community, and maintaining buffers between development and the river. Because this plan has not yet been adopted by the community, the town plan goals and policies in the existing 2009 plan are:

- The Town of Waterville should adopt Flood Hazard Regulations. Once the Town is enrolled in the National Flood Insurance Program, residents living in flood hazard areas will be able to obtain flood insurance.
- The Town of Waterville should explore the adoption of a vegetated buffer zone subject to review or according to state guidelines on both sides of the Kelley River and Taylor, Coddington, Judevine and Streeter Brooks.
- Waterville should explore the possibility of developing and implementing subdivision bylaws to ensure the preservation of the town’s rural character and to avoid the destruction of natural areas and resources through land fragmentation.

Further, the Town of Waterville’s Emergency Management Director has been active in integrating hazard mitigation projects into existing town functions. As a rural community with limited capacity, it is up to volunteers to continue pursuing funding mechanisms, trainings, and awareness raising to local leaders. The EMD has integrated this plan into the Local Emergency Operations Plan for Waterville, organized an American Red Cross Shelter Training, pursued grant funding for dry hydrant installation and a generator for the emergency shelter, encouraging ICS trainings for municipal officials, and by participating in the Local Emergency Planning Committee. Given Waterville’s lack of regulatory authority, these are the best methods by which to convey hazard mitigation strategy and prioritization.
5. Mitigation Strategies

5.1 Existing Hazard Mitigation Programs, Projects and Activities

The following is a list of anticipated or recently completed mitigation programs, projects or activities in the Town of Waterville. Additional mitigation strategies are outlined in Section 3 of the RHMP. Notes for each section describe the completed, deleted or deferred mitigation action as a benchmark for progress; if activities are unchanged, a description has been provided as to why no changes occurred, or are not necessary.

Community Preparedness Activities

- Complete yearly updates of the Basic Emergency Operations Plan and complete annual NIMS compliance survey. Ongoing. BEOP was adopted on September 18, 2012 and updates will occur on an ongoing basis.
- Participation at Local Emergency Planning Committee meetings and activities. Ongoing
- Support of mission and maintains members in the Lamoille County Community Emergency Response Team (CERT). Ongoing participation. CERT is in the process of being re-activated. Participation will be encouraged from Waterville residents.
- Ensure procedures are in place for rapid evacuation of essential facilities. A draft plan was created and the RPC and LEPC will continue work on this document during the existing planning cycle.
- Review and study the need for additional foam capability by the Fire Department to minimize the impact of a HAZMAT incident. Complete. Town of Johnson Fire Department now has foam capability.
- Ensure that all emergency response and management personnel receive HAZMAT Awareness training as a minimum. Ongoing. Trainings are accomplished through DEMHS and LEPC; EMD is participating in training.
- Continue to train public officials and local responders in the use of the Incident Command System. Ongoing. EMD has participated in ICS training.
- Continue to enhance training of the Emergency Management Director (EMD). Ongoing. EMD has been receiving training and training will continue through LEPC and DEMHS supported activities.
- Integrate additional mitigation measures in local land use planning. Ongoing. Town adopted a new Town Plan in 2009 that encourages participation in NFIP and designating a flood hazard district that prohibits new development in the plan policies and recommendations. The plan update, starting in 2013, will address mitigation measures the Town can undertake if it so chooses.
- Consider a floodplain management ordinance and work towards enrolling the town in the National Flood Insurance Program. Ongoing. Town is not currently participating in NFIP; LCPC will continue to work with the Town Selectboard and Planning Commission on flood hazard planning.
Financial and Tax Incentives

- Annual investment of local tax dollars in highway mitigation projects. **Ongoing**
- Use of State and Federal funding for mitigation projects and activities. **Ongoing**

Hazard Control and Protective Works

- Develop a Highway Maintenance Program (culvert survey & replacement, ditching along roadways, cutting vegetation to allow visibility at intersections). **Ongoing with regularly scheduled maintenance.**
- County-wide mutual aid agreement for emergency road work. **Ongoing.** Discussions about creating an intermunicipal agreement to provide emergency road services would benefit Waterville given its limited highway maintenance capabilities.

Land Use Planning/Management

- Municipal Development Plan adopted May 3, 2009 **Ongoing.** A plan update began in February 2013 and is nearing completion as of March 2014.

Protection/Retrofit of Infrastructure and Critical Facilities

- Mapping of Critical and Essential Facilities. **Remapped as of 2012.**

Public Awareness, Training & Education

- Use this plan for Hazard Identification and Mapping; include all public partners. **Since the first plan iteration, the disaster/declaration and response process has informed Town operations and the general public concerning the need for infrastructure and systems evaluation, monitoring and documentation especially as related to floods, winter storms, and power outages. This process will continue as public discussion, input and funding options for hazard mitigation projects are brought forward to the Selectboard. Additionally, all local and regional partners will use disaster events as a trigger to evaluate and improve the efficacy of this plan and necessary mitigation efforts. Each town will also play a role in the plan maintenance process spelled out in the Lamoille Regional All-Hazard Mitigation Plan.**
- Institute an Emergency Preparedness Education Program in the school. **Complete.** Waterville Elementary School completed an Emergency Plan in 2007. Ongoing actions will continue in this planning cycle through the LEPC activities.
- Enhance public education and outreach regarding the National Flood Insurance Program. **Ongoing.** The RPC held 3 county-wide workshops on the NFIP program and flood hazards for municipal officials in 2007.
- Support Family and Community Disaster Preparedness. **Deferred from last planning cycle.** Progress was made on emergency preparedness planning to address local educational institutions and special populations. In this planning cycle efforts will focus on community notification of evacuation plans and mitigation resources.
- Participate in HAZMAT Drills involving all elements of the community to practice procedures associated with a simulated HAZMAT incident. **Police Department and Fire Department participated in drills during previous planning cycle. Drills will be an ongoing function of the LEPC during this planning cycle with EMD participation encouraged.**
• Continue community support of and participation in the Lamoille County CERT and LEPC #11. Ongoing participation. CERT is in the process of being re-activated. Participation will be encouraged from Waterville residents. The EMD is very active in the LEPC 11 and attends meetings regularly, contributing valuable information to the group.

• Collaborate with American Red Cross and LCPC to complete shelter surveys and shelter agreements. Completed. A representative from the American Red Cross visited Waterville in September 2010 to execute a shelter agreement for Waterville Elementary School and the Town Offices.

Public Protection

• Survey and designation of shelter(s). Completed. Town has received American Red Cross certification for shelters at the Waterville Elementary School and Waterville Town Hall.

• Emergency communications and information systems (NOAA weather receivers, Emergency Alert System (EAS)). Ongoing

• Auxiliary Power for School (Emergency Operations Center/Shelter). Deferred action. Efforts are ongoing to secure funding to purchase a generator for the EOC/shelter.

• Hazard Vulnerability Assessments. Ongoing assessments following exercises and real events.

• Review and modify evacuation and sheltering plans based on the results of drills and exercises or procedures implemented in an actual incident, share results with community. Efforts will continue following planned drills and exercises by LEPC.

• Identify a Commodity Point of Distribution (CPOD). Completed. Waterville Elementary School has been designated a CPOD location in the event of catastrophic emergency where supplies must be brought in.

• Work with local and regional providers to develop informational database on special needs populations and elderly residents. Ongoing. In 2009 a partnership of health, human services, and emergency response agencies and organizations developed a notification card to be used by special populations. This self-reporting card was distributed to the public and returned to the Lamoille County United Way. Locations of self-reporting persons have been mapped, and the maps and information are stored at dispatch locations and shared with responders on an as-needed basis. Lamoille County’s program has become a model for a statewide effort in Vermont. Currently, methods are being developed for maintaining the database.

Science and Technology

• Stream Geomorphic Assessments to identify flood and erosion hazards. Ongoing. Two rivers were completed at various stages in Waterville during the previous planning cycle: North Branch of the Lamoille River and Judevine River.
  ○ North Branch – The stream geomorphic assessment tool and windshield survey were completed (Phase 1). A Phase 1 Report and Phase 2 assessment (in-stream study) for sections of the North Branch will be completed in the next planning cycle.
5.2 Identified Hazard Mitigation Programs, Projects and Activities

The following identified programs, projects and activities are new and/or planned for the Town of Waterville and complement Section 3 of the Lamoille County Regional All-Hazard Mitigation Plan. In Waterville, the major concern is the impact of a serious flooding and/or snow or ice storm incident where power may be out and transportation routes to the town would be impacted, effectively leaving the general public and special needs populations at risk due to delayed response time. Partners involved in completing these projects are identified in parentheses following the description.

Ultimately, hazard mitigation priorities are determined by Waterville’s ability to finance and implement these activities within the town’s existing tax base. When weighing investments in hazard mitigation, Waterville will prioritize projects that generate the highest cost-benefit ratio for the greatest number of residents. See Appendix C for more information on these projects.

- Annually review the Waterville Culvert Inventory to assess existing infrastructure and continue progress in system upgrades, maintenance and implementation to ensure safe and available access to roads. Also, incorporate the results into a new map. An update to the Waterville Culvert Study will provide the town with valuable information on where investments in new structures are needed to mitigate future flood damages and ice jam damages caused by undersized and failing culverts.
• Complete Fluvial Geomorphic Assessment work on specified rivers to provide actions that can reduce the risk of infrastructure damage due to fluvial erosion during flood and flash flood events.
  o North Branch (Phase 1 report, Phase 2 assessment for sections of the North Branch).
  o Judevine Branch (Phase 1 report)
  o A geomorphic assessment will support existing and future development by accommodating the river’s fluvial movement.
  o Ice jams and flooding can be mitigated through this action.

• Purchase back-up generator for the Waterville Elementary School emergency shelter
  o A generator for the emergency shelter is a critical piece in Waterville’s emergency preparedness and mitigation activities. Because Waterville is served by one power company, if there is a power outage, it will affect many residents in town. A generator would complement past mitigation activities to prepare the town for a major emergency requiring opening a shelter. The generator is useful for ice storms, flooding, and summer-related weather events (tornadoes, etc.).

• Develop an emergency early warning system for population of village
  o Assess the feasibility of a siren warning system for the village area and “reverse” E911 call system to alert residents. This is a present and future mitigation activity.
  o Mitigates year-round damage from year-round weather events or hazardous materials spills (not limited to any specific time of year).

• Install additional dry hydrants for fire suppression.
  o Additional dry hydrants will mitigate potential damage caused by a fire outbreak. Because there is a limited water supply in Waterville, dry hydrants provide necessary firefighting capabilities in rural communities with limited infrastructure. They also allow for disbursed firefighting capability to accommodate the rural settlement pattern in Waterville. More dry hydrants will accommodate existing and future growth patterns.
  o Fires are common in the winter in Vermont given the reliance on woodstoves and wood-burning heating devices. Fires may also occur in the summer due to drought or dry conditions.

• Continue working with the Waterville Planning Commission and Selectboard to explore the benefits of developing flood hazard regulations and enrolling in the National Flood Insurance Program (NFIP). Joining NFIP would have several benefits, including mitigating future damages to structures built within the FEMA delineated floodplain and allowing all residents to purchase subsidized flood insurance.
  o This will mitigate future damage to property and people for existing and future development in Waterville.
Other mitigation measures that should be considered by communities and families/individuals are listed by type of mitigation strategy in section 3.4 and mitigation by hazard type in section 3.5 of the RHMP. Potential funding sources by hazards type are found in section 3.6 of the plan.

6. Plan Maintenance Process

6.1 Monitoring, Evaluating, and Updating the Plan

The Waterville LHMP will be evaluated and updated regularly by the Waterville Planning Commission, with technical assistance from LCPC staff. Any significant disaster event will prompt a review of this plan between members of the Planning Commission and LCPC. At the very minimum, the plan will be amended as required within five years from the date of FEMA approval.

The LEPC will also perform a mid-cycle review of the Lamoille County Regional All-Hazard Mitigation Plan and its corresponding LHMPs within three years of adoption. This review will determine the effectiveness of the regional and municipal programs and reflect changes in land development or programs that may affect mitigation priorities. Ultimately, the long-term success of this and other LHMPs is dependent on the availability of funding to implement mitigation priorities.

6.2 Incorporation into Existing Planning Mechanisms

During the update and re-adoption processes for the Town Plan, bylaws, and/or regulations, the Town and LCPC will provide guidance and recommendations to the respective Town Boards for the incorporation and integration of state, regional and local hazard mitigation goals and strategies into the specific programs and practices described in these other planning mechanisms.

Specific opportunities for the Town to incorporate this Plan’s mitigation strategies into their own planning mechanisms include but are not limited to:

- Municipal comprehensive plans
- Municipal capital budgets
- Transportation improvement programs
- Mutual aid agreements

In order to effectively incorporate mitigation strategies into these existing planning mechanisms, it is important to demonstrate how these approaches maximize benefit to the entire community. This can be achieved through the utilization of a cost-benefit analysis, which quantifies the benefits of mitigation against anticipated losses. Such an analysis is an integral part of prioritizing potential mitigation strategies and actions, and is also a requirement for submitting future FEMA mitigation grant applications.

6.3 Continued Public Involvement

There are four principal avenues for broad public comment that include:
• Community involvement through the local and regional planning process relating to updating existing planning mechanisms
• Participation at the regular LEPC meetings (LEPC meetings are typically attended by a variety of parties: first responders, municipal officials, non-profit health care agencies, disaster assistance groups, communications industry officials and Tier II HAZMAT operators)
• Posting of the RHMP and local annexes on the LCPC webpage for public comment
• Town-level meetings and trainings where awareness issues are raised. As a small community, Waterville is able to bring people together for decision-making. A recent American Red Cross shelter training coordinated efforts between Waterville and Belvidere to broaden shelter training and planning efforts in both communities.

The general public will be notified of review and update efforts over the next five years through press releases to local newspapers, social media, announcements by local radio stations, and updates to the LCPC website. As the Town Plan is updated in 2013, efforts will be made to encourage public participation in the update process. This opportunity will allow for a community discussion to focus on land use planning as a mitigation strategy, in order to utilize regulatory and non-regulatory tools. Additionally, LCPC will reach out to other regional stakeholders, including the Lamoille Mutual Aid Association and Lamoille County Sheriff’s Department, to ensure mitigation planning efforts align with the county’s public safety interests.

Appendix A. Town of Waterville Supplemental Data and Maps

Floodplain, Bridge and Culvert Map (Tab a)
Areas of Local Concern Map (Tab b)
Critical Facilities Map (Tab c)
For planning purposes only. Not for regulatory interpretation.

Lamoille County Planning Commission
PO Box 1637, 52 Portland Street
Morrisville, VT 05661
802.888.4548  f 802.888.6938
www.lcpcvt.org
October 2011

Legend

BRIDGE
CULVERT
RIVER / STREAM
LAKE / POND
100 YEAR FLOOD

Data Sources: 2010 Bridge and Culvert Data from the Vermont Center for Geographic Information and VTrans; 100 Year Flood from the Lamoille County Planning Commission.
### Appendix B. Action Evaluation and Prioritization Matrix

<table>
<thead>
<tr>
<th>Mitigation Action</th>
<th>Responds to significant (likely or high risk) hazard</th>
<th>Likelihood of funding</th>
<th>Protect threatened infrastructure</th>
<th>Implemented quickly</th>
<th>Socially / Politically acceptable</th>
<th>Technically Feasible</th>
<th>Administratively Realistic</th>
<th>Reasonable cost to benefit</th>
<th>Environmentally sound</th>
<th>TOTAL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Fluvial Geomorphic Assessment work on the North Branch and Judevine River</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>Annually review the Culvert Inventory to assess existing infrastructure and continue system planning</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>43</td>
</tr>
<tr>
<td>Add emergency generator to the Waterville school emergency shelter</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>Develop an emergency early warning system for population of village</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Install additional dry hydrants for fire suppression</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>Consider adopting flood hazard regulations to limit damage to property and people for flood-prone areas.</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>26</td>
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</table>
### Appendix C. Implementation Schedule for Prioritized Mitigation Projects

<table>
<thead>
<tr>
<th>MITIGATION ACTION</th>
<th>WHO (LEADERSHIP)</th>
<th>WHEN (TIMEFRAME)</th>
<th>HOW (FUNDING SOURCE)</th>
<th>HAZARD BEING MITIGATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Fluvial Geomorphic Assessment work on the North Branch and Judevine River</td>
<td>LCPC, ANR</td>
<td>3 years – by 2016</td>
<td>State &amp; Federal Grants</td>
<td>Flood, Landslides</td>
</tr>
<tr>
<td>Annually review the Culvert Inventory to assess existing infrastructure and continue system planning</td>
<td>Town of Waterville Highway Foreman, LCPC</td>
<td>Annually; 1 year (2015)</td>
<td>Town of Waterville, VT Agency of Transportation</td>
<td>Flood</td>
</tr>
<tr>
<td>Add emergency generator to the Waterville school emergency shelter</td>
<td>Town of Waterville (School, Municipal, EMD), LCPC</td>
<td>1-3 years (2015-2017)</td>
<td>DEMHS, Town of Waterville</td>
<td>Power Outage, Winter Storms, Floods; All</td>
</tr>
<tr>
<td>Develop an emergency early warning system for population of village</td>
<td>Town of Waterville Fire Department, LCPC</td>
<td>1-3 years (2014-2016)</td>
<td>DEMHS, Town of Waterville</td>
<td>All</td>
</tr>
<tr>
<td>Install additional dry hydrants for fire suppression – to mitigate fire damage</td>
<td>Town of Waterville Fire Department, LCPC</td>
<td>1-2 years</td>
<td>Better Backroads, Town of Waterville</td>
<td>Fire</td>
</tr>
<tr>
<td>Consider adopting flood hazard regulations to limit damage to property and people for flood-prone areas.</td>
<td>Town of Waterville Planning Board</td>
<td>1 – 5 years</td>
<td>State (Municipal Planning Grant), HMGP</td>
<td>Flood</td>
</tr>
</tbody>
</table>