

**Annex #9 – Town of Waterville
Pre-Disaster Hazard Mitigation Plan**

Adopted November 14, 2005

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1. Introduction and Purpose

1.1 Introduction

This appendix, when used with the appropriate sections of the basic plan, is an All-Hazard Mitigation Plan for the Town of Waterville.

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 strategy that makes the communities of Lamoille County more disaster resistant.

Hazard Mitigation is any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Based on the results of previous Project Impact efforts, FEMA and state 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 all of the other phases of Emergency Management – Preparedness, Response and Recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where the hazards are most severe and identify local actions that can be taken to reduce the severity of the hazard.

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 & modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying & 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 & relocation of structures in harms way
- Establish & enforce appropriate building codes
- Public information

1.2 Purpose

The purpose of this Hazard Mitigation Plan is to assist local governments identify all hazards facing the county and their community and identify strategies to begin reducing risks from identified hazards.

1.3 Planning Process

The approach followed the Hazard Mitigation protocol established by FEMA for the conduct of this study according to the following plan:

- Gather initial available data & conduct interviews
- Gather additional relevant data
- Analyze interview information and all pertinent data gathered according to FEMA Hazard Analysis Protocol
- Produce Draft report w/recommendations & supporting data
- Obtain feedback from LCPC, Towns, and LEPC #11
- Present Findings and submit Final Report

During the conduct of the study, we followed these steps in the Hazards Inventory/Risk Analysis:

1. Determine past hazards
2. Determine possible future hazards
3. Determine likely hazards
4. Determine community vulnerability (Human & Economic) for each hazard. Each identified hazard was analyzed with respect to the following criteria:
 - a. Probability of occurrence
 - b. Effect of the potential disaster on people and property
 - c. Predictability of the hazard
 - d. Frequency of occurrence
 - e. Speed of onset of the potential disaster
 - f. Duration of the disaster
 - g. Scope and intensity of the potential disaster
 - h. Controllability of the incident
 - i. Protective Action Options
5. Determine any in-place or planned hazard reduction or mitigation efforts.
6. Make recommendations

1.4 Public Involvement

During the summer and fall of 2003 LCPC sent out various notices, announcement, and articles to all town and local officials describing the need for PDM planning and participation in the development of the PDM plan. In November of 2003 LCPC sent a letter detailing the PDM plan development process, sample hazard analysis questions and emergency planning maps to the town's emergency management coordinator (EMC). The EMC distributed the information and coordinated a meeting with members of the Planning Commission, Road Crew, Selectboard and other town officials to discuss the various hazards that affect the community and respond to the Hazard Analysis questionnaire. The EMC submitted the completed forms to LCPC in the Summer of 2004. A rough draft of the local hazard mitigation plan for the town of Waterville was provided to the Town in February 2005 for their review and comment. Once reviewed by the working group of the town, the plan was submitted to the State Hazard Mitigation Officer for review in February of 2005 and submitted to FEMA Region I for conditional approval in May of 2005. The plan received conditional approval from FEMA Region I on September 16, 2005 pending adoption by the Town Selectboard. The Town Selectboard reviewed the final draft and adopted the plan on November 14, 2006.

2. Mitigation Goals

2.1 Lamoille County Hazard Mitigation Goals

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

Goal 2: Promote an awareness amongst municipalities, residents and business in the county of the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and stormwater management and the planning and development of various land uses.

Goal 3: Encourage hazard mitigation planning as a part of the Regional and Municipal Planning Processes. Ensure that regionally-initiated mitigation measures and projects are consistent with municipal plans and the capacity of municipalities to implement them. Ensure that mitigation measures are sympathetic to the natural features of rivers, streams and other surface waters; historic resources; and character of neighborhoods.

Goal 4: Encourage municipalities to formally incorporate their individual Local All-Hazard Mitigation Plan into their municipal plan as described in 24 VSA, Section 4403(5), as well as incorporate their proposed mitigation actions into their various bylaws, regulations and ordinances, including, but not limited to, zoning bylaws and subdivision regulations and building codes.

Goal 5: Encourage municipalities to formally incorporate elements of their Local All-Hazard Mitigation Plan, particularly their recommended mitigation strategies, into their municipal operating and capital plans & programs, especially, but not limited to, as they relate to public facilities and infrastructure, utilities, highways and emergency services.

Goal 6: Plan for and implement hazard mitigation programs and projects that result in a reduced loss of life and injury during hazardous events, and a reduction of financial losses by municipalities, residents, and businesses due to disaster.

Goal 7: Provide the technical support for, and aid in the development of implementation protection mechanisms at the regional 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.

2.2 Town of Waterville Hazard Mitigation Goals

- 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

2.3 Town Plan Goals that support Hazard Mitigation

The Waterville Town Plan was adopted September 22, 2003. Primary Town Plan goals that support hazard mitigation are:

- Encourage preservation of Waterville's natural resources and scenic beauty, including water resources, open land, mountaintops and ridges, forest and agricultural land, trails and views
- Encourage citizens to be informed and engaged in the Waterville community
- Coordinate local planning with neighboring town and Lamoille County

3. Community Background

Waterville 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 commission and has a town plan. It has no zoning or subdivision regulations. One state highways run

through the Town of Waterville. VT Route 109 bisects the town and serves as the major route connecting Waterville 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 grown to 705 in 2000. This represents an increase of 50% in 20 years. As of 2000, Waterville had 284 year-round housing units. These included 222 single-family units, 23 multi-family units, 56 manufacture homes, and 3 in a recreational vehicle. There is no town-supported water supply in Waterville, most houses in Waterville have individual springs or wells. The Waterville Water cooperative serves 22 houses in the village between the school and Nellie Chase house. Its aquifer is 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 although 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.

In Waterville, 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. This is a 54-bed full service community hospital for acute, outpatient and long-term care. More specialized services are available in Burlington, Berlin, and Hanover, New Hampshire. Other outpatient care is available at other community clinics available in neighboring towns. Northern Emergency Rescue Service and Cambridge Rescue provides ambulance services for the town of Waterville. Waterville contracts with the Lamoille County Sheriff's Office for 911 emergencies. The sheriff's department then dispatches the appropriate service. Police service is provided by Vermont State Police.

The town has a draft Emergency Operations Plan (EOP) and a preliminary hazard/vulnerable site analysis identifies the Waterville Elementary School as high a risk population. Essential facilities identified in the Rapid Response Plan (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. Route 118 from the northeast floods around the intersection of 118 and 109. Route 109 floods in Waterville and the Hogback Road from Johnson is prone to flooding as well. The only other route into Waterville would be from the plot road from Johnson but this is a class 3 road and travel for emergency vehicles during mud season would be problematic.

3.1 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

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 surface, culverts and ditches.

3.2 Previous Technological Disasters

Waterville houses no Tier II hazardous Material Sites. Since January of 2001 nine (9) incidents involving hazardous materials have occurred and involved mostly heating oil or other petroleum products. There was one incident of a potential white powder substance that was refuted and one incident of a water supply break in.

A significant potential for severe pollution impacts to water quality and ecosystems exists from hazardous waste sites. The future likelihood of such an event, however, is unquantifiable. Listed below is the October 2004 update of Active Vermont Hazardous Sites. In 1991, the Hazardous Sites database and the Petroleum Sites database were consolidated. This list includes petroleum as well as non-petroleum sites. Prior to database consolidation, 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.

This list identifies sites that are listed on the National Priorities List (Superfund) using an asterisk. Also, any active site that is listed on the federal CERCLIS also appears on this list. The Vermont Hazardous Sites List Abbreviation KEY is listed below.

Active Hazardous Waste Sites, Waterville, October 2004

921315 - - - Waterville Garage - - - Main St - - - Waterville - - Surface Water Impact, Monitoring Ongoing

951876 - - - Waterville Wells - - - Route 109 - - - Waterville - - Contaminated water supply, monitoring ongoing.

Vermont Hazardous Sites List Abbreviation KEY	
*	* Indicates a National Priorities List (Superfund) Site
ACL	Alternative Concentration Limits
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation & Liability Act Information System
DEC	Department of Environmental Conservation
EPA	Environmental Protection Agency
EPI	Environmental Priorities Initiative
ESA	Environmental Site Assessment
ESI	Expanded Site Inspection
EXPRESSWAY	Investigation proceeding without state approved workplan
GW	Groundwater
HRS	Hazardous Ranking System
IP	In Progress
LF	Landfill
LSI	Listing Site Inspection
MW	Monitoring Well
NPL	National Priorities List
NUS	Nuclear Utility Services (EPA Contractor)
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PCS	Petroleum Contaminated Soil
RCRA	Resource Conservation & Recovery Act
RFA	RCRA Facility Assessment
RP	Responsible Party
RI/FS	Remedial Investigation/Feasibility Study

ROD	Record of Decision
SI	Site Inspection
SIP	Site Inspection Prioritization
SMS	Sites Management Section
SSI	Screening Site Inspection
SVE/SVS	Soil Vapor Extraction/Soil Vapor System
SW	Surface Water
UST	Underground Storage Tank
VSPS	Vermont Sites Priority System

4. Waterville Hazard Inventory / Vulnerability Assessment

The following is based on the State HI/RA and Section 2 of the Regional PDM Plan. The first column is a list of possible hazards that could affect the community. The hazards were evaluated to have an *Unlikely*, *Possible*, *Likely*, or *Highly Likely* frequency of being a threat to the community.

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

- *Unlikely*: < 1% probability in the next 100 years.
- *Possible*: 1% to 10% probability in the next year, or at least one chance in the next 100 years.
- *Likely*: 10% to 100% probability in the next year, or at least one chance in the next 10 years.
- *Highly Likely*: Near 100% probability in the next year.

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

- *Negligible*: < 10% of properties damaged/minimal disruption to quality of life.
- *Limited*: 10% to < 25% of properties damaged/loss of essential facilities/services for up to 7 days/Few (< 1% of population) injuries possible.
- *Critical*: 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) highly likely of occurrence, and/or (b) critical or catastrophic impact to your community.**

4.1 Waterville HI/RA Matrix

Table I. Waterville HI/RA

Possible Hazard	Likelihood	Impact	Community Vulnerability	Most vulnerable
Flood*	Highly likely	Catastrophic	High	Roads, culverts, bridges, residences
Flash flood*	Highly likely	Critical	High	Roads, residences, water source contamination
Power Shortage Failure*	Highly Likely	Catastrophic	High	Special needs populations, critical facilities.
Winter Storm/Ice Storm*	Highly Likely	Critical	High	Loss of access, loss of power, property damage
Highway and Railroad Accidents	Likely	Limited	Moderate	3 major intersections identified history of accidents including hazardous materials
Hazardous materials	Possible	Critical	Moderate	Residences, general population
Structure Fire	Likely	Limited	Moderate	High population centers, elderly housing,
Dam Failures	Possible	Critical	Moderate	Roads, structure, residents
Wildfire/Forest Fire	Possible	Critical	Moderate	Structures, public facilities, power infrastructure
Hurricane	Possible	Limited	Moderate	High winds, floods, power failure
Water Supply Contamination	Possible	Limited	Moderate	Wellhead protection areas, residences, businesses
Air crash	Possible	Limited	Moderate	Residents
High Wind	Likely	Limited	Moderate	Trees down, loss of power, limited road access
Drought	Possible	Limited	Moderate	Private well failures, wildfires
School safety issues	Possible	Negligible	Low	Hazmat incidents, children
Earthquake	Possible	Limited	Low	See VT Geological Survey HAZUS report (9/03)
Landslide	Possible	Negligible	Low	Roads and Structures
Tornado	Unlikely	Limited	Low	Structures, power lines
Chemical and/or Biological Incident	Unlikely	Negligible	Low	General population, Environment
Radiological Incident	Unlikely	Limited	Low	UPS trucks: largest carrier of radiological materials
Terrorism	Unlikely	Negligible	Low	Kidnapping

* Consistent significant hazards to Lamoille County

4.2 Community Vulnerability Analysis by Hazard

Based on the results of local community interviews and Hazard Questionnaire, the history of disasters in the town, and the Waterville HI/RA the following hazards were identified consistently as significant threats to the jurisdiction:

In Waterville, the interviews indicate that the following hazards are listed as Likely or Highly Likely or Medium-High in terms of **Likelihood**: Winter Storm/Ice Storm, Flooding and Flash Floods, Structure Fire, Power Shortage/Failure, High Wind, Dam Failures and Highway/Transport Accidents. In terms of **Vulnerability**, the town rated these hazards as Critical or Catastrophic or Medium-High: Flood, Winter Storm/Ice Storm, Wildfire/Forest Fire. The “Worst Threats” were identified as being:

- Flood and Flash Flooding
- Power Shortage/Failure
- Winter Storm/Ice Storm

The following analysis will focus on those hazards considered as being a significant or consistent threat to the town. Other hazards that have been identified in the HI/RA above and were not considered to be significant hazards are not included in the vulnerability analysis below. For a complete analysis of potential hazards facing the community refer to Section 2.4 of the Regional PDM plan.

Flood and Flash Flooding

The community vulnerability to a Flood is HIGH based on the Highly likely 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 FIRM flood maps with the location of structures in Waterville, which were GPS located for the development of the Enhanced 911 Emergency services telephone dispatch system, Seventeen (17) vulnerable locations were identified to have potential of flooding based on the 100-year flood zone. The estimated loss for damage to these properties was calculated by using the median housing value from the 2000 U.S. Census.

Table II. Waterville Potential Flood Loss

Town	Median Housing Value	Structures in Floodplain (% of total)	Potential Flood Loss
Waterville	\$96,200	17 (5.7%)	\$1,635,400

The Floodplain, Bridge and Culvert map (Tab a) identifies the areas of town that are within the 100-year floodplain. The local areas of concern map (Tab c) identifies other areas of potential loss to infrastructure due to erosion and road flooding. High Priority culverts have not been identified as no exists and no culvert study has been completed. 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, 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.

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. Water contamination of private wells and springs is a potential problem during flood events. In the case of an extreme flood, the North Branch of the Lamoille River can overtop its banks causing potential problems.

The Town of Waterville does not participate in the NFIP. The town has no flood hazard ordinance and must have one in place in order to apply for the insurance. LCPC is continuing to work with the town on developing a flood hazard ordinance.

Winter Storm/Ice Storm

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

Winter storms and Ice events are common in the community. Waterville encounters varying levels of snow and ice during the winter months. Due to the rapid change in elevation, 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 interesting events for highway maintenance personnel.

Damage has resulted in structural damage to residences and businesses in the past. Normally damage is result of heavy snow causing roof failures. Ice events and heavy wet snows have caused numerous power outages due to power line damage.

Roadways closed due to heavy snows are opened as quickly as possible. Waterville maintains snow removal equipment for all town highways, and State of 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 events such as this, radio communications is maintained between highway crews and town emergency responders. Emergency response personnel are assisted by highway equipment, however documented events have occurred where this response has been delayed.

Local construction equipment in the community has been used in the past to augment community resources. Most residents are accessible during severe weather conditions, however access may be delayed.

Power Shortage/Failure

The community vulnerability to a Power Shortage/Failure is HIGH based on the Highly Likely (Near 100% probability in the next year) occurrence and the potential for Limited (10% to <25% of the community) impact. Residences and Critical Facilities are most likely to be affected. One of the most common impacts of major natural disasters can be the prolonged loss of electrical power, 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 maintains a list of vulnerable populations who may require additional assistance during long term outages. Vermont Electric Co-op respond to power outages and the town is dependant upon them prolonged power outages in the areas of Coddling Hollow Road and Plot Road are common as they are often the first places to lose power and the last to get fixed. No emergency generators are located at the EOC's or shelters

Other Hazards

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 limited (> 50% of the community) impact. **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.

High Winds are possible in Waterville. A **Hurricane** hit Vermont in 1938. Most windstorms result in downed trees, damaged phone and power lines, and crop losses. **Drought** can be a problem in late summer with local springs and well levels reduced to minimal flows. Water table reached an all time low during the nationwide drought of 1988, however recovery was fairly rapid. The town has no water reservoirs in town if private wells go dry. **Earthquakes** have been felt in Waterville and remain a geological possibility but are not a frequent event. The risk of large scale **structure fires** is moderate in Waterville. The most significant risks involve the village area and residence with long driveways that may prolonged response time involved. Mutual aid agreements with surrounding municipalities are in place. **Wildfires** have occurred in the past with minimal damage involved. The potential for wildfires exists although the town has adequate equipment and mutual aid agreements in place to respond appropriately.

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. **School safety** issues involving bussing problems during natural hazards and Indoor air quality problems are also a potential threat.

4.2.1 HAZMAT Sites

Regarding Hazardous Materials the following data from the inventory maintained by LEPC #11 identifies no Tier II sites in the town of Waterville.

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 site and transportation were considered. Using the 2000 Emergency Response Guidebook, a 1000 foot buffer was selected. For fixed site facilities, a 1000 foot radius circle was drawn around that site 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. Of the 298 structures within the town 0 structures are within 1000 feet of a Tier II site. Structures include all residential, commercial and public buildings in a town. Structures are only counted once. This means that if a house is within 1000' of three Tier II sites, it is only counted once, not three times. Based on the median housing value for Waterville, provided by the 2000 U.S. Census, the estimated potential loss for all properties within 1000 feet of a Tier II is \$0. The estimated potential loss for all properties within 500 feet of a major roadway is \$28,667,600.

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

Town	Median Housing Value	Structures within 1000' of Tier II site (% of total)	Potential Tier II Hazard Loss
Waterville	\$96,200	0 (0%)	\$0

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

Town	Median Housing Value	Structures within 500' of a major road (% of total)	Potential Tier II Hazard Loss
Waterville	\$96,200	118 (40%)	\$28,667,600

4.2.2 Transportation Hazards

No major intersections have been identified by VTRANS as having a history of accidents. A culvert study has not been conducted, however culverts frequently fail during flooding events and repair or replacement is almost always needed. LCPC is in the process of working with the town in conducting a culvert studies. All bridges located in town are identified on the Floodplain, Bridge and Culvert (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. No Bridges in Waterville have a federal sufficiency rating of less than 50.

4.2.3 Areas of Local Concern

No Tier II sites are located in town however HAZMAT carriers due travel along Route 109 and the village location houses the town offices, elderly housing, the EOC and the local school.

There are 4 critical facilities in the town (Tab c.) with 0 of the critical facilities located within 1,000 feet of a Tier II site and 3 critical facilities that are impacted by 1 known hazards. Known hazards are 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 Concern include the 2 EOC's, the Elementary School and the Town offices. The emergency shelters include the Elementary School and the Town Hall neither shelter has backup generators. Other vulnerable sites include the Waterville Elementary School

5. Mitigation Strategies

5.1 Existing Hazard Mitigation Programs, Projects and Activities

The following is a list of ongoing or recently completed programs, projects or activities in the Town of Waterville. Additional Mitigation Strategies are outlined in Section 3 of the Lamoille County PDM plan.

Community Preparedness Activities

- Current RRP/EOP is completed
- Emergency Response and Management Staff attending professional training sessions
- Regularly scheduled maintenance programs ongoing (culvert survey & replacement, ditching along roadways, cutting vegetation to allow visibility at intersections)

- Participation at Local Emergency Planning Committee meetings and activities
- Support of mission and maintains members in the Lamoille County Community Emergency Response Team (CERT)

Financial and Tax Incentives

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

Hazard Control and Protective Works

- Highway maintenance Programs (culvert survey & replacement, ditching along roadways, cutting vegetation to allow visibility at intersections)

Insurance Programs

- Participation in NFIP

Land Use Planning/Management

- Municipal Development Plan adopted September 22, 2003

Protection/Retrofit of Infrastructure and Critical Facilities

- Mapping of Critical and Essential Facilities

Public Awareness, Training & Education

- Hazard Identification and Mapping
- Community NFIP outreach through county planning commission

Public Protection

- Survey and designation of shelter(s)
- Emergency communications and information systems (NOAA weather receivers, Emergency Alert System (EAS))
- Auxiliary Power for School (Emergency Operations Center/Shelter)
- Hazard Vulnerability Assessments

Science and Technology

- Stream Geomorphic Assessments, Phase I
- Traffic calming and alternate transportation project

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 PDM 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 affected 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.

Community Preparedness Activities

1. Finalize the Enhanced Emergency Operations Plan with specific emphasis on a method of early warning and notification and coverage of terrorism events (EMD, LEPC, RPC)

2. Ensure procedures are in place for rapid evacuation of essential facilities (EMD, RPC)
3. Review and study the need for additional foam capability by the Fire Department to minimize the impact of a HAZMAT incident (LEPC, RPC, FD)
4. Ensure that all emergency response and management personnel receive HAZMAT Awareness training as a minimum (SB, RPC, PD, FD)
5. Continue to train public officials and local responders in the use of the Incident Command System (SB, RPC, LEPC, PD, FD)
6. Continue to enhance training of the Emergency Management Director (EMD)
7. Integrate additional mitigation measures in local land use planning and ordinance development processes (PC, TA, SB)
8. Develop and adopt floodplain management ordinances for the town and work towards enrolling the town in the National Flood Insurance Program (PC, SB, RPC)

Public Awareness, Training, Education

1. Use this plan for Hazard Identification and Mapping, include public partners (All)
2. Institute an Emergency Preparedness Education Program in the school (LEPC, RPC)
3. Enhance public education and outreach regarding the National Flood Insurance Program (RPC)
4. Support Family and Community Disaster Preparedness (LEPC)
5. Conduct HAZMAT Drills involving all elements of the community to practice procedures associated with a simulated HAZMAT incident (LEPC, RPC, EMD, PD, FD)
6. Continue community support of and participation in the Lamoille County CERT and LEPC #11 (LEPC, SB, TA, PD, FD, HWY)
7. Collaborate with American Red Cross chapter to assist with community education programs and shelter agreements (EMD, LEPC, RPC)

Public Protection

1. 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 (EMD, RPC, LEPC)
2. Work with local and regional providers to develop informational database on special needs populations and elderly residents (LEPC, RPC)

Science, Technology and Structural

1. Fluvial Geomorphic and Landslides Hazard Assessment to evaluate landslide and flood potential in Waterville (RPC, ANR)
2. Implementation of a Waterville Culvert Study to assess condition of culverts and opportunities for replacement (HWY, SB, RPC)
3. Added emergency generators to the EOC and emergency shelter (RPC, LEPC)
4. Provide more emergency equipment and early warning systems for population of villages (RPC)
5. Increase quantity of emergency equipment such as pumps, generators and drinking water storage systems to mitigate risk to community from flooding events (EMC, RPC, FD, WD)

Key:

EMC- Emergency Management Coordinator
SB- Selectboard
TA- Town Administrator
TC- Town Clerk
HWY- Highway Department
PC- Planning Commission
FD- Fire Department
PD- Police Department
WD- Water Department
ED- Electric Department
AA- Administrative Assistant
PW- Public Works
RPC- Regional Planning Commission
LEPC- Local Emergency Planning Committee
ANR- Agency of Natural Resources River Mgmt. Program

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 Lamoille County Multi-Jurisdictional All Hazards Mitigation Plan.

Potential funding sources by hazards type are found in section 3.6 of the Lamoille County Multi-Jurisdictional All Hazards Mitigation Plan.

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)

Appendix B. Action Evaluation and Prioritization Matrix

Action Evaluation and Prioritization Matrix Town: Waterville

5 = Excellent 4 = Good 3 = Average 2 = below average (or unknown) 1 = poor

Mitigation Action	Responds to significant (likely or high risk) hazard	Likelihood of funding	Protect threatened infra-structure	Implemented quickly	Socially / Politically acceptable	Technically Feasible	Administratively Realistic	Reasonable cost to benefit	Environmentally sound	TOTAL SCORE
Fluvial Geomorphic and Landslides Hazard Assessment to evaluate landslide and flooding potential in Waterville	5	4	5	4	5	5	5	5	5	43
Implementation of a Waterville Culvert Study to assess condition of culverts and opportunities for replacement	5	4	5	4	5	5	5	5	5	43
Added emergency generators to the EOC and emergency shelter	3	4	4	3	5	4	3	3	3	32
Provide more emergency equipment and early warning systems for population of villages	5	4	5	3	5	4	5	5	3	44
Increase quantity of emergency equipment such as pumps, generators and drinking water storage systems to mitigate risk to community from flooding events	4	3	5	3	4	4	4	4	4	35

Appendix C. Implementation Schedule for Prioritized Mitigation Projects

MITIGATION ACTION	WHO (LEADERSHIP)	WHEN (DEADLINE)	HOW (FUNDING SOURCE)	HAZARD BEING MITIGATED
Fluvial Geomorphic and Landslides Hazard Assessment to evaluate landslide and flooding potential in Waterville	LCPC, VT Agency of Natural Resources	2007	PDM-C Planning, State & Federal Grants	Flood Landslides
Implementation of a Waterville Culvert Study to assess condition of culverts and opportunities for replacement	Town of Waterville, LCPC	2006	Town of Waterville, VT Agency of Transportation	Flood
Added emergency generators to the EOC and emergency shelter	Town of Waterville, LCPC	2007	Homeland Security, FEMA, State of Vermont, Town of Waterville	All
Provide more emergency equipment and early warning systems for population of villages	Town of Waterville, LCPC	2007	Homeland Security, FEMA, State of Vermont, Town of Waterville	All
Increase quantity of emergency equipment such as pumps, generators and drinking water storage systems to mitigate risk to community from flooding events	Town of Waterville, LCPC	2007	Homeland Security, FEMA, State of Vermont, Town of Waterville	All