# Town of New London, New Hampshire

# **Hazard Mitigation Plan Update 2012**



Upper Valley Lake Sunapee Regional Planning Commission

Town of New London Hazard Mitigation Committee

Ice Storm – December 2008

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# I. INTRODUCTION

### A. BACKGROUND

The New Hampshire Homeland Security & Emergency Management (NH HSEM) has a goal for all communities within the State of New Hampshire to establish local hazard mitigation plans as a means to reduce future losses from natural or human-made hazard events before they occur. The NH HSEM has provided funding to the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC), to update local Hazard Mitigation Plans with several of its communities. UVLSRPC assisted the Town of New London in preparation of their first plan which was approved by FEMA on February 22, 2008. The UVLSRPC began updating the Hazard Mitigation Plan in March 2012. The *New London Hazard Mitigation Plan* serves as a strategic planning tool for use by the Town of New London in its efforts to reduce future losses from natural and/or human-made hazard events before they occur.

The New London Hazard Mitigation Committee prepared the *New London Hazard Mitigation Plan* update with the assistance and professional services of the UVLSRPC under contract with the New Hampshire Homeland Security & Emergency Management operating under the guidance of the Federal Emergency Management Agency (FEMA). After a public meeting held in the New London Town Offices, the New London Board of Selectmen adopted the updated plan. A copy of the adoption can be found in Appendix E.

### **B. PURPOSE**

The New London Hazard Mitigation Plan is a planning tool for use by the Town of New London in its efforts to reduce future losses from natural and/or human-made hazards. This plan does not constitute a section of the Town Master Plan, nor is it adopted as part of the Zoning Ordinance. However, this plan will be referenced within the Town Master Plan as a resource, and the Hazard Mitigation Plan will be used when developing and amending town regulations and ordinances to restrict development in hazard-prone areas.

### C. HISTORY

On October 30, 2000, President Clinton signed into law the Disaster Mitigation Act of 2000 (DMA 2000). The ultimate purpose of DMA 2000 is to:

- Establish a national disaster mitigation program that will reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from disasters, and
- Provide a source of pre-disaster mitigation funding that will assist States and local governments in accomplishing that purpose.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section: 322 – Mitigation Planning. This places new emphasis on local mitigation planning. It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition to receiving Hazard Mitigation Grant Program (HMGP) project grants. Local governments should review and if necessary, update the mitigation plan annually. A five-year update is required to continue program eligibility.

### *Why develop a Mitigation Plan?*

Planning ahead to lessen or prevent a disaster will reduce the human, economic, and environmental costs. The State of NH is vulnerable to many types of hazards, including floods, hurricanes, winter storms, wildfires, wind events, and earthquakes. All of these types of events can have significant economic, environmental, and social impacts. The full cost of the damage resulting from the impact of natural hazards – personal suffering, loss of lives, disruption of the economy, and loss of tax base – is difficult to quantify and measure.

### **D. SCOPE OF THE PLAN**

The scope of the *New London Hazard Mitigation Plan* includes the identification of natural hazards affecting the Town, as identified by the New London Hazard Mitigation Committee. The hazards were reviewed under the following categories as outlined in the State of New Hampshire Hazard Mitigation Plan. The Committee has determined that landslides and subsidence are not risks in New London.

- Dam Failure
- Flooding
- Hurricane
- Tornado & Downburst
- Thunderstorm/Lightning/Hail

- Erosion
- Severe Winter Weather
- Earthquake
- Extreme Heat
- Drought

- Wildfire/Urban Fire
- Natural Contaminants
- Hazardous Materials Spill
- Terrorism
- Public Health

### E. METHODOLOGY

Using the *Guide to Hazard Mitigation Planning for New Hampshire Communities* (2002) developed by the Southwest Regional Planning Commission (SWRPC), the New London Hazard Mitigation Committee, in conjunction with the UVLSRPC, developed the content of the updated *New London Hazard Mitigation Plan* by tailoring the nine-step process set forth in the guidebook to a ten-step process as appropriate for the Town of New London. Many FEMA resources and multiple State and Federal websites were also used

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as well. The Committee held a total of four posted meetings beginning in April 2012 and ending in August 2012. All meetings were posted at the Town Offices inviting the general public. A notice was placed in the local paper, the Intertown Record, to invite the public to work meetings. Notices were sent to the Town Offices of neighboring towns to invite town officials. There were no public attendees at the meetings from New London, and no one inquired about the process. One student from a neighboring town attended to learn more about hazard mitigation. It is anticipated that there may be more interest at the Select Board meeting to adopt the plan. For the meeting agendas see Appendix C: Meeting Documentation.

The public will continue to have the opportunity to be involved in future revisions as meetings will be posted publicly. The New London Board of Selectmen adopted the Plan, contingent upon FEMA final approval at a public meeting, as shown in Appendix E.

There is an opportunity for partnerships between local boards, most notably the Board of Selectmen and the Planning Board, to implement the recommendations in this Plan.

- The Town of New London participates in Mutual Aid agreements with neighboring communities for police, fire, highway, and hazardous materials spills. Appendix F provides available agreements.
- The office of the New Hampshire Homeland Security and Emergency Management had an opportunity to participate in and comment on this planning process, as well as review the draft plan.

The following hazard mitigation meetings were vital to the development of this Plan:

March 20, 2012 – Introduction April 17, 2012 May 2, 2012 June 19, 2012 August 13, 2012

To complete the update of this Plan, the Hazard Mitigation Committee revisited the following planning steps. The format of the plan was changed to accommodate the most recent requirements since the original plan was completed. Each section was reviewed and revised during the Committee meetings and by research of the various relevant departments of the Town.

### **Step 1: Identify and Map the Hazards (April 2012)**

Committee members identified areas where damage from natural disasters had previously occurred, areas of potential damage, and human-made facilities and infrastructure that were at risk for property damage and other risk factors. A GIS-generated base map provided by the UVLSRPC was used in the process.

### Step 2: Determine Potential Damage (April 2012)

Committee members identified facilities that were considered to be of value to the Town for emergency management purposes, for provision of utilities and services, and for historic, cultural and social value. A GIS-generated map was prepared to show critical facilities identified by the New London Hazard Mitigation Committee. A summary listing of "Critical Facilities" is presented in Chapter IV. Costs were determined for losses for each type of hazard.

### Step 3: Identify Mitigation Plans/Policies Already in Place (May 2012)

Using information and activities in the handbook, the Committee and UVLSRPC staff identified existing mitigation strategies which are already implemented in the Town related to relevant hazards. A summary chart and the results of this activity are presented in Chapter VI.

### **Step 4: Identify the Gaps in Existing Mitigation Actions and Progress from the 2008 Plan (May 2012)**

Existing strategies were then reviewed for coverage, effectiveness and implementation, as well as need for improvement. Some strategies are contained in the Emergency Action Plan and were reviewed as part of this step. The result of these activities is presented in Chapter VI. In addition, reference is made to the 2008 Plan suggested improvements and if not completed, explanations of why they were not completed.

### **Step 5: Determine New Actions to be Taken (May 2012)**

During an open brainstorming session, the Hazard Mitigation Committee developed a list of other possible hazard mitigation actions and strategies for the Town of New London. Ideas proposed included policies, planning, and public information. A list of potential mitigation strategies can be found in Chapter VII. Some new actions may have been suggested in the 2008 plan. This is noted as appropriate in Table VII-1

### **Step 6: Evaluate Feasible Options (June 2012)**

The Hazard Mitigation Committee evaluated strategies based on eight criteria derived from the criteria listed in the evaluation chart found on page 27 of the *Guide to Hazard Mitigation Planning for New Hampshire Communities*. The eight criteria used for evaluation of potential mitigation strategies are listed in Chapter VII. Each strategy was rated (high (3), average (2), or low (1)) for its effectiveness in meeting each of the eight criteria (e.g., Does the mitigation strategy reduce disaster damage?). Strategies were ranked

by overall score for preliminary prioritization then reviewed again under step eight. The ratings of the potential mitigation strategies can be found in Chapter VII.

### Step 7: Coordinate with other Agencies/Entities (Annually)

UVLSRPC staff reviewed the New London Master Plan. This was done in order to determine if any conflicts existed or if there were any potential areas for cooperation. Town staff that is involved in preparing the updated Emergency Operations Plan participated in the hazard mitigation meetings to avoid duplication and to share information.

### Step 8: Re-evaluate and Determine Priorities (June 2012)

The Committee reviewed the prioritization list from the 2008 plan in order to make changes and determine a final prioritization for existing hazard mitigation action improvements and proposed new actions. These are provided in Chapter VIII.

### Step 9: Develop Implementation Strategy (June 2012)

Using the chart provided under step nine of the *Guide to Hazard Mitigation Planning for New Hampshire Communities*, the Committee created an implementation strategy which included person(s) responsible for implementation (who), a schedule for completion (when), and a funding source and/or technical assistance source (how) for each identified hazard mitigation action. The prioritized implementation schedule can be found in Chapter VIII.

### Step 10: Adopt and Monitor the Plan

UVLSRPC staff compiled the results of steps one through nine in a draft document, as well as helpful and informative materials from the *State of New Hampshire Natural Hazard Mitigation Plan* (2010), which served as a resource for the *New London Hazard Mitigation Plan*. The process for monitoring and updating the Plan can be found in Chapter IX.

### F. HAZARD MITIGATION GOALS

The Town of New London Hazard Mitigation Committee reviewed the hazard mitigation goals for the State of New Hampshire, and revised them for New London. The goals were reviewed again during the update of the plan and determined to remain mostly valid although some goals were combined and the goal to reduce the Town's liability with respect to natural and man-made hazards was eliminated as it seemed redundant.

They are as follows:

- 1. To identify, introduce and implement cost effective Hazard Mitigation measures so as to accomplish the Town's goals and to raise awareness and acceptance of hazard mitigation opportunities generally.
- 2. To improve upon the protection of the general population, the citizens, and visitors of the Town of New London from natural and human-made hazards.
- 3. To reduce the potential impact of natural and human-made disasters to:
  - the Town of New London's Critical Support Services,
  - Critical Facilities in the Town of New London,
  - the Town of New London's infrastructure,
  - private property,
  - the Town's economy,
  - the Town's natural environment, and
  - the Town's specific historic treasures and interests.
- 4. To improve the Town's Disaster Response and Recovery capability as a hazard mitigation strategy to be prepared for emergencies and reduce their impact.

### G. ACKNOWLEDGEMENTS

The following people participated in the update of this plan as the Hazard Mitigation Committee:

Don Bent, Town of New London Health Officer Peter Berthiaume, Colby Sawyer College, New London Kelly Collins, Assistant Principal, Kearsarge Regional Elementary School Chad Denning, Town of New London Emergency Management Director and Recreation Director Michael doCurral, Director Facilities Department, Kearsarge Schools Pamela Drewniak, New London Hospital Larry Elliott, Kearsarge Regional Elementary School Jerry Frew, Kearsarge Regional Elementary School Nancy Friese, Director Council on Aging Kim Hallquist, Town Administrator Richard Lee, Public Works Director Jay Lyon, Town of New London Fire Chief Jeanie Plant, Caring Animal Partners Dave Seastrand, Town of New London Police Chief Don West, Kearsarge Regional Elementary School Kent Wheeler, New London Hospital

Nancy St. Laurent, NH Homeland Security and Emergency Management Office Victoria Davis, Upper Valley Lake Sunapee Regional Planning Commission

The Hazard Mitigation Committee is composed of local officials, representatives from state agencies (NH HSEM), citizens of New London and staff representatives of the UVLSPRC for meeting facilitation and plan development. Neighboring communities, agencies, businesses, academia, non-profits and other interested parties were invited to participate through the public posting of meeting times and agendas, by invitation or by public notice in the local newspaper. Historical information, relevant data and potential future mitigation strategies were contributed by all parties involved in the planning process. For a record of all meeting topics see Appendix C: Meeting Documentation. The staff representative of the UVLSRPC gathered all information from local officials, agency representatives and public input and compiled the information to develop the Plan.

# **II. COMMUNITY PROFILE AND DEVELOPMENT TRENDS**

### A. **INTRODUCTION**<sup>1</sup>

The Town of New London, NH is located in the Lake Sunapee region. Springfield, Wilmot, Sutton, Newbury, and Sunapee border New London. Its area is



### Figure 1: Locus Map of New London

<sup>&</sup>lt;sup>1</sup> Town of New London Master Plan (2011) and discussions with Committee.

New London straddles the major watershed divide between the Connecticut River to the west and the Merrimack River to the east. New London is located at the top of three major watershed, and therefore, is the headwaters for these downstream and river systems: Sugar River Watershed, Warner River Watershed, and Blackwater River Watershed.

Water bodies in New London cover 2,061 acres or about 13% of the total area of New London. These include Lake Sunapee, Little Lake Sunapee, Pleasant Lake, Otter Pond, Goose Hole Pond, Messer Pond, and Clark Pond. There are just over 11.5 miles of perennial and intermittent watercourses in town.

New London's wetlands are valuable for mitigating flooding events and erosion. Because of their soils and vegetation, wetlands act as a giant sponge during periods of high runoff and flooding, controlling the rate of runoff downstream and slowing floodwaters. In late summer, this stored water is slowly released, maintaining stream flows downstream. New London has three wetlands designated as prime wetlands: the Philbrick-Cricenti Bog, the Esther Currier Wildlife Management Area at Low Plain, and the Goose Hole Marsh. It is estimated that approximately 11% of New London's land area is wetland.

As part of the National Flood Insurance Program (NFIP), Flood Hazard Boundary Maps were prepared for the Town in 1986 and updated in 2010. The maps identified the 100-year floodplain areas which are shown on the hazards map in Appendix D. There are bands of flood zones around Lake Sunapee, Little Lake Sunapee, Clark Pond, Messer Pond, Pleasant Lake, as well in other areas of town.

# B. MUNICIPAL INFRASTRUCTURE

The Town of New London has an inter-municipal agreement with the Town of Sunapee for wastewater treatment. An 11-mile long force main from New London to Sunapee was completed in 1981. There are two pump stations along this route: one located at the site of the old treatment plant in New London and one in Georges Mills in Sunapee. There is also a meter vault at the town line to measure flows from New London. There are additional public and private pumping stations. An estimated 30% of the residential dwelling units are served by this system. The remaining units have private septic systems.

New London is served by a municipal water system which is owned by the New London-Springfield Water System Precinct. Precinct boundaries generally encompass the village center and the surrounding area. Areas outside the precinct boundaries are served by private on-site wells.

The Water Precinct is now supplied by six gravel packed wells located on Colby Point on Little Sunapee Lake in the Town of Springfield. The water from the wells is fed directly into the water distribution system via a water line connecting to the existing line

located in the Twin Lake Villa Road. A one million gallon water storage tank is located along the Kidder Brook in Springfield and is situated next to the existing water storage reservoirs which will be retained for emergency use. The entire water system can be fed by gravity from the new storage tank. About 36% of New London dwelling units are served by the water system.

A booster pump station and water storage tank on the Colby-Sawyer campus was installed in 2006. This now provides a back-up water supply should service be interrupted on the main water line from Springfield.

# C. DEVELOPMENT TRENDS

New London has the fourth highest population density in the region (behind Lebanon, Claremont, and Hanover, in that order), yet when one crosses into Town by any one of over half a dozen approaches, one has the impression of a rural community. With a relatively small land area and a comparatively large population, New London's population density is quite high in comparison to neighboring towns. Only Sunapee comes close in comparing population density. The population density in New London is also higher than the density of the County and the State.

New London has experienced a steadily increasing population for at least forty years. New London's rate of increase, however, has been faster than the State, as a whole, and many of its neighboring communities. During the 1990s alone, New London's annual population growth rate was 2.6%, about 2.5 times the state or regional rate of increase.

The Colby Sawyer College student enrollment has risen steadily, from a low of 408 in 1985 to the peak enrollment to date of 986 in 2003. The anticipated peak enrollment is estimated by College officials to be about 1,100.

Increasingly, available sites for development are constrained by steep slopes, exposed ledge, wetlands and other natural features. These sites are more expensive to develop and increase the community's vulnerability to natural hazards such as flooding, erosion, forest fire, and other events. These developments also challenge the capabilities and efficiency of emergency response services in town, as they are often more remote and difficult to access.

In 1994, the New London Planning Board conducted a build-out analysis. Consultants for New London recently revised the estimates based on changes to the Zoning Ordinance and determined the following results:

• The Town land area and regulations may accommodate up to 4,374 residential units. This is approximately 2,071 dwelling units more than the 2010 Census count of 2,303 dwelling units.

• The total population under full build-out conditions could reach 9,000, which is more than double the 2010 Census count of 4,397 persons.

Future development will include student housing on Cottage Lane which is before the Planning Board at the time of this update. There are also two very large farms in town which could potentially be developed in the future. These are located at Lake Sunapee Road and Morgan Hill Road. None of these areas are in hazard areas.

Area	1980	1990	2000	2010
New London	2,935	3,180	4,116	4,397
Newbury	961	1,347	1,702	2,072
Springfield	532	788	945	1,311
Sunapee	2,312	2,559	3,055	3,365
Sutton	1,091	1,457	1,544	1,837
Wilmot	725	935	1,144	1,358
Merrimack County	98,302	120,240	136,225	146,445
New Hampshire	920,475	1,109,252	1,235,786	1,316,470
New Hampshire	920,475	1,109,252	1,235,786	1,316,470

#### **Table II-1: AREA POPULATION TRENDS**

Source: US Census

#### **Table II-2: POPULATION PROJECTIONS FOR NEW LONDON**

	1980	1990	2000	2010	2020	2030
Population 2,236	2.935	3,180	4,116	4,397	5,070	5,460
Decade Change in Population	31.3%	8.3%	29.4%	6.8%	15.3%	7.7%

Source: 1970 – 2010 from US Census; 2020 – 2030 projections from U.S. Census

	1	990	20	2000		2005		2010		2020	
Population Category	Winter	Summer									
Year-Round Population	2,653	2,653	3,490	3,490	3,573	3,573	4,386	4,386	5,313	5,313	
Colby-Sawyer Students	527		626		714		730	730	803		
Tourist Accommodations	258	506	258	506	258	506	258	258	258	506	
Summer Residents		1,798		1,463		1,430				1,296	
Gordon Research Conference		250		250		250				250	
Seasonal Population Estimate	3,438	5,207	4,374	5,709	4,545	5,759	5,359	5,374	6,539	7,365	

#### Table II-3: NEW LONDON POPULATION BY SEASON, 1990-2020

Sources: Town of New London Master Plan, December 27, 2011

# **III. HAZARD IDENTIFICATION**

The New London Hazard Mitigation Committee reviewed the list of hazards provided in the *State of New Hampshire Hazard Mitigation Plan*, and some hazard history for the State of New Hampshire and Merrimack County in particular. A list of past hazard events in New London, Merrimack County, and the State of New Hampshire can be found in the following discussion and tables. After reviewing this information and the Emergency Operations Plan, the Committee conducted a Risk Assessment. The resulting risk designations are provided in the heading of each hazard table below as well as a more detailed discussion further into this chapter.

### A. WHAT ARE THE HAZARDS IN NEW LONDON?

New London is prone to a variety of natural and human-made hazards. The hazards that New London is most vulnerable to were determined through gathering historical knowledge of long-time residents and Town officials; research into the CRREL Ice Jam Database, FEMA and NOAA documented disasters, and local land use restrictions; and from the input of representatives from state agencies (NH HSEM). The hazards affecting the Town of New London are dam failure, flooding, hurricane, tornado and downburst, thunderstorm (including lightning and hail), erosion, severe winter weather (including extreme cold and ice storms), earthquake, drought, extreme heat, wildfire, natural contaminants to air and water, hazardous materials spills, potential terrorism, and public health hazards. Each of these hazards and the past occurrences of these hazards are described in the following sections. Hazards that were eliminated from assessment are those that have not had a direct impact on the Town of New London and are not anticipated to have an impact as determined by the Hazard Mitigation Committee, representatives from state agencies and citizens of the Town of New London.

Hazards eliminated from consideration include Expansive Soils, Subsidence, Landslides, and Snow Avalanches. Elimination is due to factors such as topography, soils, and location of development not conducive to these hazards.

Natural Contaminants was added to reflect radon as examined in the State Plan and also including other natural contaminants found in the State. Erosion was added even though it is often related to flooding. It can be related to simple rain storms and development without proper precautions. Drought and Extreme Heat were added as these are potential hazards though they have not occurred frequently.

### **B. DESCRIPTIONS OF HAZARDS**

An assessment of each hazard relevant to New London is provided below. An inventory of previous and potential hazards is provided. Past events are shown in the following tables and the potential for future events is then discussed and shown on a map in Appendix D. The "risk" designation for each hazard was determined after evaluations discussed later in this chapter.

- Dam Failure
- Flooding
- Hurricane
- Tornado & Downburst
- Thunderstorm/Lightning/Hail

- Erosion
- Severe Winter Weather
- Earthquake
- Extreme Heat
- Drought

- Wildfire/Urban Fire
- Natural Contaminants
- Hazardous Materials Spill
- Terrorism
- Public Health

Dam failure results in rapid loss of water that is normally held by the dam. These kinds of floods pose a significant threat to both life and property. Appendix D is a map with the location of dams within New London. There are no mapped inundation areas.

**Dam Failure** 

	DAMS – POTENTIAL FAILURE: LOW/MEDIUM RISK									
Dam #	Class	Dam Name	Water Body	Owner (Past or Present)	Status	Туре	Impound- ment Area in Acres	Height of Dam (Ft)	Drainage Area in Acres	
176.01	L	Goose Pond Dam	Little Sunapee Br	Donald Catino	active	С	15.000	12.00	8.80	
176.02	Н	Pleasant Lake Dam	Trib. Blackwater River	Town of New London	active	Е	606.000	11.00	11.30	
176.03	NM	Blackwater River Dam	Blackwater River	Ralph Lapham	active	С	1.000	9.00	8.10	
176.04	L	Hayes Dam	Blackwater River	Town of New London	active	Е	2.000	12.00	11.30	
176.05	NM	Little Sunapee Dam	Little Sunapee	NH Water Resources Council	active	С	488.000	5.50	6.40	
176.06	NM	Recreation Pond Dam	Unnamed stream	Thomas C. Richards	active	С	0.050	7.00	0.00	
176.07	NM	Recreation Pond Dam	Unnamed stream	Thomas C. Richards	active	С	0.100	6.00	0.00	
176.08	NM	Recreation Pond Dam	Unnamed stream	Thomas C. Richards	active	С	0.030	4.00	0.00	
176.09	NM	Clevelands Dam	Trib Cascade Br	James C. Cleveland	active	Е	1.000	14.00	0.00	
176.10		Farm Pond Dam	Natural swale	James C. Cleveland	Not built	Е	0.750	16.00	0.08	

DAMS – POTENTIAL FAILURE: LOW/MEDIUM RISK									
Dam #	Class	Dam Name	Water Body	Owner (Past or Present)	Status	Туре	Impound- ment Area in Acres	Height of Dam (Ft)	Drainage Area in Acres
176.11	NM	Murray Pond Dam	Trib Little Lake Sunapee	Murray Pond Assoc	active	Е	5.000	8.00	0.00
176.12	NM	Currier Wildlife Pond Dam	Trib Cascade Brook	Gerald Gold	active	Е	0.300	12.00	0.00
176.13		Hilltop Place Trust Dam	Runoff	Hilltop Place Trust	exempt	Е	0.500	2.00	0.02
176.14	L	Colonial Operating Dam	Trib Otter Pond	Snolsen, Inc.	active	Е	0.750	8.00	0.03
176.15		Lake Sunapee Country Club Dam	Hunting Brook	Lake Sunapee Country Club	Not built	Е	0.400	9.00	1.17
176.16	NM	Gray Dam	Runoff	Anne Gray	active	Е	0.160	8.50	0.01
176.17	NM	Lake Sunapee Country Club Dam	Hunting Brook	The Seasons at Lake Sunapee Country Club	active	Е	0.900	8.00	0.84
176.18		Cricenti's Market Pond Dam	Runoff	Cricenti's Market	exempt	Е	0.100	2.00	0.01
176.19	NM	Country Club Dam	Hunting Brook	Lake Sunapee CC Dev Corp	active	Е	0.300	6.00	0.78
176.20	NM	Todd Farm Subd Detention Pond 1 Dam	Runoff	Todd Farm Assoc.	active	Е	0.330	13.50	0.01
176.21		Todd Farm Subd Detention Pond Dam	Runoff	Todd Farm Assoc.	Not built	Е	0.600	25.00	0.14
176.22	NM	Deming Wildlife Pond 1 Dam	Whitney Brook	Charles Deming	active	Е	0.800	7.00	0.07
176.23	NM	Deming Wildlife Pond 2 Dam	Whitney Brook	Charles Deming	active	Е	1.900	9.00	0.22
176.24	NM	Recreation Pond Dam	Unnamed stream	Eugene Caggiano	active	C/E	0.500	4.60	0.00
176.25	NM	Columbus Ave. Detention Pond Dam	Trib Lake Sunapee	Town of New London	active	С	2.300	9.00	0.54
Source: T emergent – Signific	Source: Dam information provided by the NH Dam Bureau in 2007 and updated by the Committee in 2011; Significant & High Hazard dams must have an emergency action plan. The State of New Hampshire classifies dams into the following four categories: Blank- Non-Active; NM – Non-menace; L – Low hazard; S – Significant hazard; H – High Hazard; E-Earth; C-Concrete ; NB-Not Built								

### Past Dam Failure Events

There have been no dam failures in New London or any surrounding towns which impacted New London. Several dams are rated by the State as "non-menace" or "low" hazard structures. This means there is no possibility for loss of life if any of these dams fail. A "low" hazard dam failure could cause some structural damage to buildings and roads though a "non-menace" dam failure would not. There are 16 non-menace dams and three low hazard dams. There is one dam that was recently changed from a "significant" hazard to a "high" hazard. This means there is a high hazard potential because the dam is in a location and of a size that failure or mis-operation of the dam would result in any of the following: Major economic loss to structures or property; structural damage to roads; major environmental; or public health losses; and probable loss of human life. These rankings were assigned by the NH Department of Environmental Services.

The inundation areas for the "high" hazard dam is shown on a map in Appendix D. Typically, any dam of significant or high hazard potential must submit an inundation plan and inundation area map to the State in case of dam failure. The inundation area for the Pleasant Lake Dam inundation area is shown on the map in Appendix D.

It does not appear from mapping resources that there are dams located in surrounding towns that would impact the Town of New London if they were to fail. There are a few dams in Springfield with flow into New London, but none are rated as significant or high hazard risk.

### Potential Future Dam Failure Events

According to the State's Mitigation Plan (2010), Merrimack County has a low risk of dam failure. The Committee determined dam failure is a low/medium risk in New London.

### Flooding

Flooding is the temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination, and can disrupt travel routes on roads and bridges.

Floods in the New London area are most likely to occur in the spring due to the increase in rainfall and snowmelt; however, floods can occur at any time of the year. A sudden winter thaw or a major summer downpour can cause flooding. Floodplains indicate areas potentially affected by flooding. There are several types of flooding.

<u>100-Year Floods</u> The term "100-year flood" does not mean that flooding will occur once every 100 years, but is a statement of probability to describe how one flood compares to others that are likely to occur. What it actually means is that there is a one percent chance of a flood in any given year. These areas were mapped for all towns in New Hampshire by FEMA.

<u>River Ice Jams</u> Ice forming in riverbeds and against structures presents significant hazardous conditions when storm waters encounter these ice formations which may create temporary dams. These dams may create flooding conditions where none previously existed (i.e., as a consequence of elevation in relation to normal floodplains). Additionally, there is the impact of the ice itself on structures such as highway and railroad bridges. Large masses of ice may push on structures laterally and/or may lift structures not designed for such impacts.

<u>Rapid Snow Pack Melt</u> Warm temperatures and heavy rains cause rapid snowmelt. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

<u>Severe Storms</u> Flooding associated with severe storms can inflict heavy damage to property. Heavy rains during severe storms are a common cause of inland flooding.

Beaver Dams and Lodging Flooding associated with beaver dams and lodging can cause road flooding or damage to property.

<u>Bank Erosion and Failure</u> As development increases, changes occur that increase the rate and volume of runoff, and accelerate the natural geologic erosion process. Erosion typically occurs at the outside of river bends and sediment deposits in low velocity areas at the insides of bends. Resistance to erosion is dependent on the riverbank's protective cover, such as vegetation or rock riprap, or its soils and stability.

### Past Flooding Events

Appendix D is a map which shows the locally identified flood area and the Flood Insurance Rate Map of Special Flood Hazard Areas. The following tables provide a list of floods in the State, County, and New London.

Riverine flooding is the most common disaster event in the State of New Hampshire, according to the State of New Hampshire Natural Hazards Mitigation Plan. According to the Plan: "Localized street flooding occasionally results from severe thundershowers, or over larger areas, from more general rain such as tropical cyclones and coastal "northeasters." More general and disastrous floods are rare but some occur in the spring from large rainfall quantities combined with warm, humid winds that rapidly release water from

the snowpack...General flooding is also caused by major hurricanes that closely follow major rainstorms... As a result, New Hampshire has a high flood risk. (*State of NH Natural Hazards Mitigation Plan, Pages 12-13*)"

The following table lists past flood events. Note that Table III-5 for Erosion events also includes some flooding events.

Hazard	Date	Location	Description of Areas Impacted	Damages
Flood	November 3-4, 1927	Statewide	NA	Unknown
Flood	March 11-21, 1936	NH State; Along Connecticut River	Damage to roads. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather. River overflow.	Unknown
Flood/Hurr icane	September 21, 1938	Statewide	Flooding in several locations	Unknown
Flooding	June 15-16, 1943	Upper CT River	Intense rain exceeding four inches	
Flooding	August 1955	CT River Basin	Heavy rains caused extensive damage throughout basin	
Flooding	July – Aug 1986	Statewide	Severe summer storms: heavy rains, tornados flash flood, and severe winds (FEMA DR-771-NH)	
Flood / Severe Storm	April 16, 1987	Cheshire, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, & Sullivan Counties, NH	FEMA Disaster Declaration # 789-DR (Presidentially Declared Disaster). Flooding of low-lying areas along river caused by snowmelt and intense rain.	\$4,888,889 in damage.
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	FEMA Disaster Declaration #876-DR. Flooding caused by a series of storm events with moderate to heavy rains.	\$2,297,777 in damage.
Flooding	August 19, 1991	Statewide	Hurricane Bob - effects felt statewide	
Flooding	October - Nov. 1995	North/West NH	Grafton County Declared: FEMA DR-1144-NH	
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties, NH	FEMA Disaster Declaration # 1077- DR. Flooding caused by heavy rains; related to Hurricane Lily	\$2,341,273 in damage.
Flood	December 17, 2000	New London to Andover	NOAA recorded heavy rains and snow melt causing river overflows	
Flood	October 26th	Cheshire, Grafton,	FEMA Disaster Declaration #1610-DR. Severe storms and	\$30,000,000 in damages.

Table III-2: FLOODING – FEMA DISASTER DECLARATIONS, LOCAL RECOLLECTIONS & CRREL ICE JAM INFORMATION

Hazard	Date	Location	Description of Areas Impacted	Damages
	2005	Merrimack, Sullivan, and Hillsborough Counties	flooding.	
Flood	May 13 -17, 2006	Belknap, Carroll, Grafton, Hillsborough, Rockingham, Strafford Counties	FEMA Disaster Declaration #1643-DR	Unknown
Flood	April 16, 2007	Statewide	FEMA Disaster Declaration #1695. Severe storms and flooding; Counties Declared: all; several road washouts in New London	\$27,000,000 in damages; 2,005 home owners and renters applied for assistance in NH.
Flood	July 24, 2008	Central and Southern NH; Counties Declared: Belknap, Carroll, Merrimack, Rockingham, and Strafford	FEMA DR 1782	Severe storms, tornado, and flooding
Flood	August 14, 2008	Central Northern NH; Counties Declared: Belknap, Carroll, Coos, and Grafton	FEMA Disaster Declaration #1787	\$3 million in public assistance; primary damage to roads
Flood	March 14-31, 2010	Statewide	FEMA DR-1913; severe storms & flooding; Declared Counties: Hillsborough and Rockingham Counties	75% federal match
Flood	May 26-30, 2011	Coos and Grafton Counties	FEMA-4006-DR Federal assistance for Coos and Grafton Counties and hazard mitigation statewide	\$1.8 million in public assistance; primary impact to roads and bridges
Flood	May 29-31, 2012	Cheshire County	FEMA DR-4065: severe storm and flood event	
Flood	Frequent to Annual	New London	Elkins Lake area; Forest Acres Road; Bog Road; Stoneybrook Road; King Hill Road (state); Little Sunapee Road (State); Columbus Avenue, Lamson Lane, Otter Pond	

# Potential Future Flooding Events

According to the State's Mitigation Plan, flooding is a high hazard risk in the county. The Committee determined flooding is a low/medium risk in New London.

The Town of New London has been a participant in the National Flood Insurance Program since July 16, 1991 and the current effective NFIP map is dated April 2010. There are about 123 residential buildings (108 homes, 15 outbuildings exclusively) and 2 buildings at Twin Lakes Village within the "Special Flood Hazard Areas." A map in Appendix D displays the "Special Flood Hazards Areas." There are currently 14 NFIP flood insurance policy holders in the Town of New London with a total insurance value of just over \$3 million. Total losses that have been paid out are \$13,500. There are no repetitive loss claims.

### Hurricane

A hurricane is an intense tropical weather system with a well-defined circulation and maximum sustained winds of 74 mph (64 knots) or higher. Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye" is generally 20 to 30 miles wide, and the storm may extend outward 400 miles. As a hurricane nears land, it can bring torrential rains, high winds, and storm surges. A single hurricane can last for more than 2 weeks over open waters and can run a path across the entire length of the eastern seaboard. August and September are peak months during the hurricane season that lasts from June 1 through November 30. Damage resulting from winds of this force can be substantial, especially considering the duration of the event, which may last for many hours (*NH Natural Hazard Mitigation Plan*; FEMA website).

The Saffir-Simpson Hurricane Wind Scale provides categories of sustained winds by miles per hour: 1 - 74-95 mph; 2 - 96-110 mph; 3 - 111-129 mph; 4 - 130 - 156 mph; and 5 - 157 mph or higher. Categories 3 -5 are considered to be major wind events that can cause devastating to catastrophic damage.

### Past Hurricane Events

There have been several hurricanes over the years which have impacted New England and New Hampshire. These are listed below. The Hurricane of 1938 substantial property damage and downed trees blocked roads.

HURRICANES AND TROPICAL STORMS - MEDIUM RISK								
Hazard	Date	Location	Description of Areas Impacted	Damages				
Hurricane	August, 1635	n/a		Unknown				
Hurricane	October 18-19, 1778	n/a	Winds 40-75 mph	Unknown				
Hurricane	October 9, 1804	n/a		Unknown				
Gale	September 23, 1815	n/a	Winds > 50mph	Unknown				
Hurricane	September 8, 1869	n/a		Unknown				
The Great New England Hurricane	September 21, 1938	Southern New England	Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total storm losses of \$12,337,643 (1938 dollars). 186 mph maximum winds.	Unknown				
Hurricane (Carol)	August 31, 1954	Southern New England	Category 3, winds 111-130 mph. Extensive tree and crop damage in NH, localized flooding	Unknown				
Hurricane (Edna)	September 11, 1954	Southern New England	Category 3 in Massachusetts. This Hurricane moved off shore but still cost 21 lives and \$40.5 million in damages throughout New England. Following so close to Carol it made recovery difficult for some areas. Heavy rain in NH	Unknown				
Hurricane (Donna)	September 12, 1960	Southern and Central NH	Category 3 (Category 1 in NH). Heavy flooding in some parts of the State.	Unknown				
Tropical Storm (Daisy)	October 7, 1962	Coastal NH	Heavy swell and flooding along the coast	Unknown				
Tropical Storm (Doria)	August 28, 1971	New Hampshire	Center passed over NH resulting in heavy rain and damaging winds	Unknown				
Hurricane (Belle)	August 10, 1976	Southern New England	Primarily rain with resulting flooding in New Hampshire. Category 1	Unknown				
Hurricane (Gloria)	September, 1985	Southern New England	Category 2, winds 96-110 mph. Electric structures damaged; tree damages. This Hurricane fell apart upon striking Long Island with heavy rains, localized flooding, and minor wind damage in NH	Unknown				

### Table III-3: HURRICANES & TROPICAL STORMS

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HURRICANES AND TROPICAL STORMS - MEDIUM RISK					
Hazard	Date	Location	Description of Areas Impacted	Damages	
Hurricane (Bob)	August 19, 1991	Southern New England	Structural and electrical damage in region from fallen trees. 3 persons were killed and \$2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR	Unknown	
Hurricane (Edouard)	September 1, 1996	Southern New England	Winds in NH up to 38 mph and 1 inch of rain along the coast. Roads and electrical lines damaged	Unknown	
Tropical Storm (Floyd)	September 16-18, 1999	Southern New England	FEMA DR-1305-NH. Heavy Rains; New London received damage	Unknown	
Hurricane (Katrina)	August 29, 2005 & continuing	East Coast of US and more	FEMA-3258-EM. Heavy rains and flooding devastating SE US	Unknown	
Tropical Storm (Tammy)	October 5-13, 2005	East Coast of US	Remnants of Tammy contributed to the October 2005 floods which dropped 20 inches of rain in some places in NH.	Unknown	
Tropical Storm (Irene)	August 26 – September 6, 2011	East Coast of US	FEMA-4026-DR for Coos, Carroll, Grafton, Strafford, Belknap, Merrimack and Sullivan Counties; EM-3333; trees down in New London; there was time to clean culverts so little road damage; EM-333 Hillsboro, Rockingham, and Cheshire Counties	\$2 Million primarily for roads and bridges	

### Potential Future Hurricane Events

Hurricane events will affect the entire Town. It is impossible to predict into the future what damage will occur in the Town. According to the State's mitigation plan, Merrimack County has a medium risk for hurricanes. The Committee determined the hurricane risk to be medium in New London.

#### **Tornado & Downburst**

"A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. These events are spawned by thunderstorms and, occasionally by hurricanes, and may occur singularly or in multiples. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. Most vortices remain suspended in the atmosphere. Should they touch down, they become a force of destruction." (*NH Natural Hazard Mitigation Plan*). The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. Most tornadoes are in the F0 to F2 Class. Building to modern wind standards provides significant property protection from these hazard events. New Hampshire is located within Zone 2 for Design Wind Speed for Community Shelters, which suggests that buildings should be built to withstand 160 mph winds.

Significantly high winds occur especially during tornadoes, hurricanes, winter storms, and thunderstorms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during severe wind occurrences. A downburst is a severe, localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories: 1. Microburst, which covers an area less than 2.5 miles in diameter, and 2. Macroburst, which covers an area at least 2.5 miles in diameter. Most downbursts occur with thunderstorms, but they can be associated with showers too weak to produce thunder.

#### Past Tornado & Downburst Events

The following table displays tornadoes occurring in Merrimack County. The New London Hazard Mitigation Committee could not recall any tornado events that have impacted the Town of New London.

TORNADOES & DOWNBURSTS – MEDIUM RISK					
Date         Fujita Scale         Damages					
Tornado	September 9, 1821	Intense in NH	Killed 6 people; crossed Lake Sunapee		
Tornado	July 14, 1963	F1	No deaths or injuries; costs unknown		
Tornado	June 27, 1964	F0	No deaths or injuries; costs unknown		
Tornado	August 11, 1966	F2	No deaths or injuries; costs unknown		
Tornado	August 25, 1969	F1	No deaths or injuries; costs unknown		
Tornado	May 31, 1972	F1	No deaths or injuries; costs unknown (Merrimack County)		
Tornado	July 21, 1972	F1	No deaths or injuries; costs unknown		
Tornado	May 11, 1973	F2	No deaths or injuries; costs unknown		
Tornado	June 11, 1973	F0	No deaths or injuries; costs unknown		

#### Table III-4: TORNADOES AND DOWNBURSTS IN OR NEAR MERRIMACK COUNTY

TORNADOES & DOWNBURSTS – MEDIUM RISK				
	Date	Fujita Scale	Damages	
Tornado	August 15, 1976	F1	No deaths; 5 injuries; costs unknown (Merrimack County)	
Tornado	August 13, 1999	F1	No deaths or injuries; costs unknown	
Tornado	July 6, 1999	F2	No deaths or injuries; costs unknown (Merrimack County); in New London two roofs	
			blown off structures; power outages,; downed trees, utility pole, and wires	
Tornado	Summer 2006	NA	Began in Barnet, VT and moved to Monroe, NH	
Tornado	April 15, 2007	NA	Numerous trees were knocked down in Enfield, NH	
Tornado	July 24, 2008	(EF 2)	Numerous trees and utility poles down and tearing down houses near Concord; 1	
	fatality and 2 injuries			

Source: The Tornado Project web site and the State of NH Multi-Hazard Plan (October 2010)

#### Potential Future Tornado & Downburst Events

It is impossible to predict where a tornado or wind event will occur or what damage it will inflict. The FEMA website places the State of NH in the Zone 2 Wind Zone which provides that a community shelter should be built to a 160 mph "design wind speed." According to the State's mitigation plan, Merrimack County has a high risk for tornadoes. The Committee determined there is a medium risk for tornadoes and downbursts in New London.

#### Thunderstorms

A thunderstorm is a rain shower during which you hear thunder. Since thunder comes from lightning, all thunderstorms have lightning. A thunderstorm is classified as "severe" when it contains one or more of the following: hail three-quarter inch or greater, winds gusting in excess of 50 knots (57.5 mph), or a tornado. Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. When the hail particle becomes heavy enough to resist the updraft, it falls to the ground. The resulting wind and hail can cause death, injury, and property damage.

An average thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Winter thunderstorms are rare because the air is more stable, strong updrafts cannot form because the surface temperatures during the winter are colder.

Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the

sun. Fires are a likely result of lightning strikes, and lightning strikes can cause death, injury, and property damage. It is impossible to predict where lightning will strike.

### Past Thunderstorm Events

On June 9, 2007, a severe thunderstorm produced 0.88" hail in New London. On May 26, 2010, a thunderstorm produced 0.75" hail in New London. (*from NOAA web site*)

### Potential Future Thunderstorm Events

It is inevitable that thunderstorms will occur in New London's future. Lightning, hail, or wind from a thunderstorm could impact the entire Town. It is not possible to estimate possible damage. According to the State's mitigation plan, Merrimack County has a medium risk of a lightning hazard. The risk for future thunderstorm damage was determined by the Committee to be low/medium risk in New London.

### Erosion

Soil erosion, although a natural process, can be greatly accelerated by improper construction practices. Because of the climate in New Hampshire and the general nature of our topography, eroded soils can be quickly transported to a wetland, stream, or lake. The New Hampshire Department of Environmental Services (DES) regulates major construction activities to minimize impacts upon these resources. A properly conducted construction project should not cause significant soil erosion.

Soil becomes vulnerable to erosion when construction activity removes or disturbs the vegetative cover. Vegetative cover and its root system play an extremely important role in preventing erosion by: (1) Shielding the soil surface from the impact of falling rain drops; (2) Reducing the velocity of runoff; (3) Maintaining the soil's capacity to absorb water, and (4) Holding soil particles in place.

Because of the vegetation's ability to minimize erosion, limiting its removal can significantly reduce soil erosion. In addition, decreasing the area and duration of exposure of disturbed soils is also effective in limiting soil erosion. The designer must give special consideration to the phasing of a project so that only those areas actively under construction have exposed soils. Other factors influencing soil erosion are: (1) Soil types, (2) Land slope, (3) Amount of water flowing onto the site from up-slope, and (4) Time of year of disturbance.

### Past Erosion Events

There have been several erosion events in New London, most recently in August 2008, April 2007, and October 2005. Many were primarily road washes associated with flooding and are addressed in that section. Repairs have many completed on many of these problem areas or they are in the works with the exception of the projects listed in the following table.

#### Table III-5: EROSION AREAS

Date	Location/Hazard	Description	Damages
Once every	Bog Road at Messer Pond	Road is low	Washouts due to flooding or major storm event
several years			
Most springs	Stoney Brook Road	Low, flat road in wetland	Shoulders wash out
Most springs	Columbus Avenue	Culverts undersized, road low, and shoulders unstable; road in	Road washout in spring and after storm event
		low, flat area surrounded by wetland	
Most springs	Lamson Lane	Needs ditch work and culverts too small for water	Road washout – mitigation work in progress

### Potential Erosion Events

Due to the topography and types of soils of the town, there is always potential for erosion. As properties are developed there will be less vegetative buffer to protect the town from erosion during rainstorms. The State plan does not provide a risk analysis for erosion. The Committee determined that erosion is a low/medium risk in New London.

### Severe Winter Weather

Ice and snow events typically occur during the winter months and can cause loss of life, property damage, and tree damage.

<u>Heavy Snow Storms</u> A heavy snowstorm is generally considered to be one which deposits four or more inches of snow in a twelvehour period... A blizzard is a winter storm characterized by high winds, low temperatures, and driving snow. According to the official definition given in 1958 by the U.S. Weather Bureau, the winds must exceed 35 miles per hour and the temperatures must drop to 20°F (-7°C) or lower. Therefore, intense Nor'easters, which occur in the winter months, are often referred to as blizzards. The definition includes the conditions under which dry snow, which has previously fallen, is whipped into the air and diminishes visual range. Such conditions, when extreme enough, are called "white outs."

<u>Ice Storms</u> Freezing rain occurs when snowflakes descend into a warmer layer of air and melt completely. When these liquid water drops fall through another thin layer of freezing air just above the surface, they don't have enough time to refreeze before reaching the

ground. Because they are "supercooled," they instantly refreeze upon contact with anything that that is at or below 0 degrees C, creating a glaze of ice on the ground, trees, power lines, or other objects. A significant accumulation of freezing rain lasting several hours or more is called an ice storm. This condition may strain branches of trees, power lines and even transmission towers to the breaking point and often creates treacherous conditions for highway travel and aviation. Debris impacted roads make emergency access, repair and cleanup extremely difficult.

"<u>Nor'easters</u>" Nor'easters can occur in the eastern United States any time between October and April, when moisture and cold air are plentiful. They are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surfs that cause severe beach erosion and coastal flooding. A Nor'easter is named for the winds that blow in from the northeast and drive the storm up the east coast along the Gulf Stream, a band of warm water that lies off the Atlantic coast.

There are two main components to a Nor'easter: Gulf Stream low-pressure system (counter-clockwise winds) generate off the coast of Florida. The air above the Gulf Stream warms and spawns a low-pressure system. This low circulates off the southeastern U.S. coast, gathering warm air and moisture from the Atlantic. Strong northeasterly winds at the leading edge of the storm pull it up the east coast. As the strong northeasterly winds pull the storm up the east coast, it meets with cold Arctic high-pressure system (clockwise winds) blowing down from Canada. When the two systems collide, the moisture and cold air produce a mix of precipitation.

Winter conditions make Nor'easters a normal occurrence, but only a handful actually gather the force and power to cause problems inland. The resulting precipitation depends on how close you are to the converging point of the two storms. Nor'easter events which occur toward the end of a winter season may exacerbate the spring flooding conditions by depositing significant snow pack at a time of the season when spring rains are poised to initiate rapid snow pack melting. *Past Extreme Winter Weather Events* 

Extreme winter weather events occur annually in New London, but usually have minimal impacts on infrastructure and property. There are a few areas in town where extreme cold impacts road conditions and causes hazardous driving. There are three particular areas: on Route 103 and Lakewood Manor Road on the west side of Lake Sunapee, on Park 10 Road, and on Route 103 at the intersection with Mountain Road. The higher elevation of New London relative to neighboring towns produces more severe winter weather conditions. The following table provides a list of past extreme winter weather events in New Hampshire and New London.

### Table III-6: EXTREME WINTER WEATHER

EXTREME WINTER WEATHER – MEDIUM/HIGH RISK				
Hazard	Date	Location	Description of Areas Impacted	Damages
Ice Storm	December 17-20, 1929	New Hampshire	Unprecedented disruption and damage to telephone, telegraph and power system. Comparable to 1998 Ice Storm (see below)	Unknown
Ice Storm	Dec. 29-30, 1942	New Hampshire	Glaze storm; severe intensity	Unknown
Blizzard	February 14-17, 1958	New Hampshire	20-30 inches of snow in parts of New Hampshire	Unknown
Snow Storm	March 18-21, 1958	New Hampshire	Up to 22 inches of snow in south central NH	Unknown
Snow Storm	December 10-13, 1960	New Hampshire	Up to 17 inches of snow in southern NH	Unknown
Snow Storm	January 18-20, 1961	New Hampshire	Up to 25 inches of snow in southern NH	Unknown
Snow Storm	February 2-5, 1961	New Hampshire	Up to 18 inches of snow in southern NH	Unknown
Snow Storm	January 11-16, 1964	New Hampshire	Up to 12 inches of snow in southern NH	Unknown
Blizzard	January 29-31, 1966	New Hampshire	Third and most severe storm of 3 that occurred over a 10- day period. Up to 10 inches of snow across central NH	Unknown
Snow Storm	December 26-28, 1969	New Hampshire	Up to 41 inches of snow in west central NH; ice storm took out power for a week in nearby towns.	Unknown
Snow Storm	February 18-20, 1972	New Hampshire	Up to 19 inches of snow in southern NH	Unknown
Snow Storm	January 19-21, 1978	New Hampshire	Up to 16 inches of snow in southern NH	Unknown
Blizzard	February 5-7, 1978	New Hampshire	New England-wide. Up to 25 inches of snow in mid-NH	Unknown
Ice Storm	January 8-25, 1979	New Hampshire	Major disruptions to power and transportation	Unknown
Snow Storm	February, 1979	New Hampshire	President's Day storm	Unknown
Ice Storm	February 14, 1986	New Hampshire	Fiercest ice storm in 30 yrs in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to New London NH	Unknown

EXTREME WINTER WEATHER – MEDIUM/HIGH RISK				
Hazard	Date	Location	Description of Areas Impacted	Damages
Extreme Cold	November-December, 1988	New Hampshire	Temperature was below 0 degrees F for a month	Unknown
Ice Storm	March 3-6, 1991	New Hampshire	Numerous outages from ice-laden power lines in southern NH	Unknown
Snow Storm	February/March 1993	New Hampshire	New London residents remember 3 storms with 36" of snow ( <i>per 2006 plan</i> )	Unknown
Snow Storm	1997	New Hampshire	Power outages due to heavy snowfall	Unknown
Ice Storm	January 15, 1998	New Hampshire; heavily impacted in New London	Federal disaster declaration DR-1199-NH; in New London it hit everywhere except Pleasant Lake; no power for about a week; boundaries to town closed off; one-lane roadway; tree cleanup with large crews made up of NH HSEM, other towns, local contractors, etc.	20 major road closures, 67,586 without electricity, 2,310 without phone service, \$17+ million in damages to Public Service of NH alone; in New London it hit everywhere except Pleasant Lake
Snow Storm	March 5-7, 2001	New Hampshire	Heavy snow.	In New London, four roofs damaged, two total collapsed; significant staff time for cleanup
Snow Storm	December 6-7, 2003	New Hampshire	Heavy snow. Federal Disaster Declaration FEMA-3193- NH	Unknown
Snow Storm	February 10-12, 2005	New Hampshire	Heavy snow. Federal Disaster Declaration FEMA-3208- NH	Unknown
Flooding	April 15, 2007	New Hampshire	Debris removal. Federal Disaster Declaration FEMA- 1695-DR-NH	Unknown
Ice Storm	December 2008	New Hampshire	Debris removal. FEMA DR-1812; power outages in New London	\$15 Million
Wind Storm	February 23 – March 3, 2010	New Hampshire	FEMA DR-1892; Federal funding to Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan Counties; power loss	\$2 Million
Snow Storm	March 6-7, 2011	New Hampshire	Heavy snow.	Unknown
Snow Storm	October 29-30, 2011	Statewide	EM-3344; FEMA-4049 Hillsborough & Rockingham Counties; no power outages in New London	Unknown

EXTREME WINTER WEATHER – MEDIUM/HIGH RISK					
Hazard	Date	Location	Description of Areas Impacted	Damages	
Ice Storm	January 27, 2012	Region	Power outages in New London	Unknown	

### Potential Future Severe Winter Events

All areas of New London are at risk from ice storms, but particularly the higher elevations. There has been frequent loss of power and road and tree damage. There is the potential for severe winter damage every year. The event would affect the entire Town.

According to the State's mitigation plan, Merrimack County has a high risk for severe winter weather. The Committee determined severe winter weather to be a medium/high risk in New London.

### Earthquake

New England is considered a moderate risk earthquake zone. An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and cause landslides, flash floods and fires. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and the Mercalli scale.

#### Past Earthquake Events

The following is a list of earthquakes which impacted New England, New Hampshire, and New London. *Potential Future Earthquake Damage:* 

A United States Geographic Survey mapping tool on the web (geohazards.cr.usgs.gov/ projects) projects a 5 - 6 peak ground acceleration (pga) with 10% probability of exceedance in 50 years for the Town of New London. This pga rating is equivalent to a Modified Mercalli Intensity of "V" with moderate perceived shaking and very light potential damage. An earthquake event would impact the entire Town. Two inactive fault lines cross into southwest New London, but it is believed they pose no threat.

According to the State's mitigation plan, Merrimack County has a medium/high risk for earthquakes. The Committee determined the risk to be low in New London.
EARTHQUAKES – LOW RISK					
	Location	Magnitude	Damage/Notes		
February 5, 1663	St. Lawrence River area	NA	Eastern Canada and New England		
October 29, 1727	New London, MA	NA	Widespread damage Massachusetts to Maine; aftershocks for several months		
September 16, 1732	St. Lawrence Valley	NA	Felt at Piscataqua; centered near Montreal with much damage		
November 18, 1755	Cape Ann, MA	NA	Much damage to Boston; felt from Chesapeake Bay to Halifax, NS		
November 9, 1810	Exeter, NH	Intensity VI	Felt in Kennebunkport and Portland		
November 18, 1872	Concord, NH	"Moderate"	Felt in adjacent towns and Laconia		
December 19, 1882	Concord, NH	"Moderate"	Buildings shook in Dover and Pittsfield.		
January 18, 1884	Contoocook	"Moderate"	NA		
November 23, 1884	Concord, NH	"Heavy"	Felt in MA, CT, and NY		
May 1, 1891	Concord, NH	"Mild Tremor"	Felt in Cambridge and Melrose, MA		
October 9, 1925	SE NH and ME	NA	Moderate damage		
March 18, 1926	Manchester, NH	Intensity V	Buildings rocked in New Ipswich		
March 8, 1927	Concord, NH	"Small, localized"	Felt lightly in Cheshire and Hillsborough Counties		
April 25, 1928	Northern NH	"Violent" in some places	Extended in to Maine and Vermont		
November 18, 1929	Grand Banks, NL	7.2	All of NH felt minor effects		
November 1, 1935	Timiskaming, Canada	6.25 (Intensity V)	Many places in NH reported the shock		
December 20, 1940	Ossipee, NH	Both earthquakes 5.5	Damage to homes, water main rupture; impacted CT, ME, MA, NH, RI,		
December 24, 1940	Ossipee, NH	(Intensity VII)	VT & NJ; many aftershocks		
June 26, 1964	Meriden, NH	Reached intensity VI	Slight damage in Bradford, NH and Springfield, VT		
June 15, 1973	NH/Quebec border	4.8	NA		
January 19, 1982	West of Laconia, NH	4.5	NA		
Late 1980s	New London	NA	Residents remember an event; no structural damage		
September 26, 2010	New Hampshire	3.4	Centered in Boscawen, NH		
August 23, 2011	Central Virginia, East Coast	5.8	Felt in New London		

#### Table III-7: EARTHQUAKES

Source: earthquake.usgs.gov/earthquakes/states/new\_hampshire/history.php for eathquakes through 1964. NH Multi-Hazard Mitigation Plan, 2010 for 1973-1982; earthquake.usgs.gov/earthquakes (12/13/11)

#### **Extreme Heat**

Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. These event conditions may impact the health of both humans and livestock.

### Past Extreme Heat Events

The Committee members do not recall anyone in the town having issues with extreme heat. The following table lists the extreme heat events in the past which included the Northeast and New Hampshire.

#### **Table III-8: EXTREME HEAT**

Date	Location	Description	Damage
July, 1911	New England	11-day heat wave in New Hampshire	Unknown
Late June to September, 1936	North America	Temps to mid 90s in the northeast	Unknown
June - August, 1999	Northeast	Mean temperatures well above long-term average	Unknown
Early August, 2001	New Hampshire	Mid 90s and high humidity	Unknown
August 2-4, 2006	New Hampshire	Regional heat wave and severe storms	Unknown
July 2010	Northeast	Regional heat wave	Unknown

### Potential Future Extreme Heat Events

Extreme heat would impact the entire city though those with air conditioning in their homes would have less impact. The costs of extreme heat are most likely to be in human life. The elderly are especially susceptible to extreme heat. The State did not develop a county risk factor for extreme heat in its *NH Hazard Mitigation Plan*. The Committee determined extreme heat to be a low/medium risk in New London.

#### Drought

A drought is defined as a long period of abnormally low precipitation. The effects of drought are indicated through measurements of soil moisture, groundwater levels and stream flow; however, not all of these indicators will be low during a drought. Costs can include loss of agricultural crops and livestock.

#### Past Drought Events

The following is a list of past drought events which impacted the State and New London.

#### Table III-9: DROUGHT

DROUGHT – <i>LOW/MEDIUM</i> RISK						
Date	Location	Description	Damages			
1929-1936	Statewide	Regional. Recurrence Interval 10 to $> 25$ years	Unknown			
1939-1944	Statewide	Severe in southeast and moderate elsewhere. Recurrence Interval 10 to > 25 years	Unknown			
1947-1950	Statewide	Moderate. Recurrence Interval 10 to $> 25$ years	Unknown			
1960-1969	Statewide	Regional longest recorded continuous spell of less than normal precipitation. Encompassed most of the Northeastern US. Recurrence Interval > 25 years	Unknown			
2001-2002	Statewide	Third worst drought on record. May have had dug wells go dry in New London.	Unknown			

Source: State of NH Multi-Hazard Mitigation Plan, October 2010

### Potential Future Drought Events

Drought will affect the entire Town. The damage will depend upon the crops being grown at the time of the drought. No cost has been assigned to residential wells going dry though new wells may have to be dug or drilled. Water bans are often instituted when summer residents substantially increase the population in town.

According to the State's mitigation plan, Merrimack County has a medium risk for drought. The Committee determined drought to be a low/medium risk in New London.

# Wildfire/Urban Fire

Wildfire is defined as any unwanted and unplanned fire burning in the forest, shrub or grass. Wildfires are frequently referred to as forest fires, shrub fires or grass fires, depending on their location. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. The threat of wildfires is greatest where vegetation patterns have been altered by past unsafe land-use practices, fire suppression and fire exclusion. Vegetation buildup can lead to more severe wildfires.

Increased severity over recent years has decreased capability to extinguish wildfires. Wildfires are unpredictable and usually destructive, causing both personal property damage and damage to community infrastructure, cultural and economic resources.

Negative short term effects of wildfires include destruction of timber, forage, wildlife habitats, scenic vistas and watersheds. Some long term effects include erosion and lowered water quality.

There are many types and causes of fires. Wildfires, arson, accidental fires and others all pose a unique danger to communities and individuals. Since 1985, approximately 9,000 homes have been lost to urban/wild land interface fires across the United States (Northeast States Emergency Consortium: www.nesec.org). The majority of wildfires usually occur in April and May, when home owners are cleaning up from the winter months, and when the majority of vegetation is void of any appreciable moisture making them highly flammable.

The threat of wildland fires for people living near wildland areas or using recreational facilities in wilderness areas is real. Dry conditions at various times of the year and in various parts of the United States greatly increase the potential for wildland fires. Advance planning and knowing how to protect buildings in these areas can lessen the devastation of a wildland fire. To reduce the risk to wildfire, it is necessary to consider the fire resistance of structures, the topography of property and the nature of the vegetation in the area.

## Past Wildfire Events

There is strict enforcement of outside burning and fire permits. The greatest danger is weather driven during periods of drought especially in spring before the grass has greened up. Although there has only been one recent fire in the northern part of town, the area is very steep, heavily forested, and is largely inaccessible. A lightning fire on July 21, 2012 only burned two acres, but could easily have gotten out of hand and burned a much larger area.

### Potential Future Wildfire Events

There are many large, contiguous forest tracts in New London. Where development interfaces with the forested areas is called the "urban interface." These are the areas where structures could be impacted by a wildfire. The Committee considers all structures within New London to be in an urban interface, and wildfire could affect the entire Town in structural and timber loss. However, the risk for urban fire is very small as New London has a very active commercial sprinkling system. According to the State's mitigation plan, the county has a high probability of wildfire.

Prolonged drought increases the likelihood of such events. Due to ice and wind storms in recent years, there is substantial fuel in the forests for wildfires.

In New London, the Forest Conservation District at the Wilmot line is very sparsely population and difficult to access.

The Committee determined that the risk of wildfire and urban fire in New London is medium.

#### Natural Water & Air Contaminants

Radium, radon and uranium are grouped together because they are radionuclides, unstable elements that emit ionizing radiation. These three particular substances are a health risk only if taken into the body by ingestion or inhalation. They occur naturally in the environment, uranium and radium as solids in rock while radon exists as a gas. Radionuclides are undetectable by taste, odor, or color, so only analytical testing can determine if they are present in water. Because they are associated with rock, wells drilled into bedrock are more likely to contain elevated levels of radionuclides than shallow or dug wells.

Radon gas can also be found in the soil. Openings between the soil and buildings, such as foundation cracks and where pipes enter, provide conduits for radon to move into structures. The difference in air pressure, caused by heated indoor air moving up and out of buildings, results in a flow of soil gas toward the indoors, allowing radon to potentially accumulate in structures. Air quality in a home can also be tested for radon.

There are many other natural contaminants which can render drinking water unsafe such as arsenic. The Drinking Water and Groundwater Bureau of the NH Department of Environmental Services has several fact sheets available to address these natural materials and suggests which materials to be included in testing. See their list of fact sheets at <u>http://www.des.state.nh.us/dwg.htm</u>.

#### Past Natural Water & Air Contaminant Events

There have been no known events related to natural water and air contamination in New London although there has been radon recorded in the area.

#### Potential Future Natural Air & Water Contaminant Damage:

Although there are no known records of illness that can be attributed to radium, radon, or uranium or other contaminants in New London, residents should be aware that they are present. Houses with granite and dirt cellars are at increased risk to radon gas infiltration. According to the table above, Merrimack County radon levels are below the mean average for the State. According to the State's mitigation plan, Merrimack County has a medium probability of a radon related hazard.

In addition radium, radon, and uranium as well as other natural materials can be present in drinking water. Residents, especially with bedrock wells, should be aware of the possibility of water contamination and the availability of testing and remediation. The Committee determined that the risk of natural contaminants is a low/medium risk in New London.

RADON							
County	# Tests	G. Mean	Maximum	% > 4.0 pCi/l	% > 12.0 pCi/l		
Belknap	744	1.3	22.3	14.4	1.3		
Carroll	1042	3.5	478.9	45.4	18		
Cheshire	964	1.3	131.2	15.6	2.3		
Coos	1072	3.2	261.5	41	17		
Grafton	1286	2.0	174.3	23.2	5.2		
Hillsborough	2741	2.1	202.3	29.6	6.8		
Merrimack	1961	2.0	152.8	25.2	6		
Rockingham	3909	3.0	155.3	40	9.5		
Strafford	1645	3.4	122.8	44	13		
Sullivan	466	1.4	29.4	15.7	2.1		
STATEWIDE	15860	2.4 pCi/L	478.9 pCi/L	32.4	8.6		

#### Table III-10: RADON

Source: Summary Table of Short-term Indoor Radon Test Results in NH's Radon Database 11/04/2003

#### **Hazardous Materials Spills**

Hazardous materials spills or releases can cause damage of loss to life and property. Short or long-term evacuation of local residents and businesses may be required, depending on the nature and extent of the incident. There are two types of potential spills: on-site or during transportation through town.

#### Past Hazardous Waste Spill Events

There have been no significant hazardous waste spills in New London—only minor spills at fuel tanks. There have been faulty underground storage tanks which have been cleaned up.

#### Potential Future Hazardous Waste Spill Events

There conceivably could be other spills near any home or business in New London during to home heating fuel delivery. The property owner is responsible for clean-up. The State oversees these reported spills. There are several fuel tanks in New London including the gas stations, the marina, and the Town Highway Garage, the New London Hospital and Colby Sawyer College Ivey Science Center (limited). The New London Hospital would have other hazardous materials related to medical services.

Also, Route 11, 114, and 103A are major travel routes through the town where trucks could be transporting hazardous materials.

The State Plan did not provide a hazard risk ranking for hazardous materials spills. The Committee determined that the risk of hazardous materials spills is a low/medium risk for on-site spills and medium/high for transportation spills in New London.

### Terrorism

Terrorism has been defined in many ways. The word terrorism is derived from the Latin term "terrere" which means to frighten. Under current United States law, set forth in the US Patriot Act, acts of domestic terrorism are those which: "(A) involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any State; (B) appear to be intended— (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the conduct of a government by mass destruction, assassination, or kidnapping; and (C) occur primarily within the territorial jurisdiction of the United States."

# Past Terrorism Events

There have been no terrorism events within New London in the past.

### Future Terrorism Events

The facilities with the greatest public threat would be the water supply and public buildings. There is also the potential for impact by terrorists if they are traveling to an intended target and have an accident or are stopped by law enforcement in New London.

The State did not provide a county hazard risk for terrorism. The Committee determined that the risk of terrorism is a low/medium risk in New London.

# **Public Health**

Public Health concerns include contamination to drinking water, infectious diseases like meningitis, and insect-borne diseases. There are many gathering places for people where diseases could be transferred. The Colby Sawyer College, Kearsarge Elementary School, and the New London Hospital are all potential sites for the spread of contagious disease. The Greater Sullivan County Public Health Emergency Plan is constantly being updated and is referenced for more information.

### Past Public Health & Infectious Disease Events

There have been no known major public health or infectious disease events in New London.

### Future Public Health & Infectious Disease Events

There is always the potential for public health issues such as infectious disease especially due to a large transient population of summer residents and tourists. New strains of diseases are continually found, and the Town will always need to be prepared for new and known infectious diseases.

Colby Sawyer College may also be a facility likely to spread disease such as neuroviruses, tuberculosis, and meningitis. Statistically speaking, meningococcal meningitis strikes fewer than 3,000 people in the United States each year, many of them college students or children under age one, but while the bacterial infection is relatively rare, it is also deadly, killing 10 to 12 percent of those it infects, sometimes within hours. The disease attacks and shuts down major organs and prevents blood from circulating to limbs, causing tissue to die. Among survivors, 20 percent suffer brain damage, kidney disease, loss of hearing or sight, limb amputations or other severe complications.

The disease is spread through air droplets and direct contact with someone who is infected. College students, particularly freshmen living in dorms, are at increased risk because of their lifestyle. They are living away from home for the first time and many share everything from drinks to drags off cigarettes. And too many late nights of studying and partying can leave their immune systems rundown and vulnerable.

The Committee determined that the risk for public health is low in New London.

# C. HAZARD RISK RATINGS

The Town of New London Hazard Mitigation Committee reviewed each potential hazard and rated the probability of occurrence and vulnerability (cost if the hazard actually occurs) to come up with an overall risk rating. The ratings were based on past occurrences of hazards affecting the State of New Hampshire, Merrimack County, and the Town of New London. Severe Winter was ranked at a medium/high risk in New London. New London has made recent efforts to reduce the vulnerability to hazards such as culvert replacements and town-wide dissemination of public information to prepare for emergencies.

### **Assessing Probability**

The process involved assigning a number to each hazard type based on its potential of occurring determined using the committee's knowledge of past events:

- 1 Unlikely: may occur after 25 years
- 2 Possible: may occur within 10-25 years
- 3 Likely: may occur within 10 years

An n/a score was given if there was insufficient evidence to make a decision. To ensure some balance with a more scientific measurement, the plan also identifies the probability of occurrence from the State Hazard Plan as shown in Table III-10. For comparative purposes the Low rating was given a designation of "1," the Medium rating a designation of "2," and the High rating a designation of "3." These figures are shown in Table III-12. Table III-11 shows the probabilities determined for the County within the 2010 State Plan.

Flood	Dam Failure	Drought	Wildfire	Earth- quake	Land- slide	Radon	Tornado	Hurricane	Lightning	Severe Winter	Avalanche
Н	L	М	Н	M/H	М	М	Н	М	М	Н	L

#### Table III-11: PROBABILITY OF HAZARD IN MERRIMACK COUNTY FROM STATE PLAN, 2010

### Assessing Vulnerability

A relative scale of 1 to 3 was used to determine the impact and cost for human death and injury, property losses and damages, and business/agricultural impact: 1 -limited damage and cost; 2 -moderate amount of damage and cost, and 3 -high damage and cost.

	Human Impact	Property Impact	Economic Impact	Vulnerability
Committee Assessment of Vulnerability	Probability of death or injury	Physical losses and damages	Cottage businesses & agriculture	Avg. of human/ property/ business impact
Dam Failure	3	3	1	2.3
Flooding	1	2	1	1.3
Hurricane	2	3	3	2.6
Tornado & Downburst	2	2	2	2.0
Thunderstorm/Lightning/Hail	1	1	1	1.0
Erosion	1	1	1	1.0
Severe Winter/Ice Storms	2	3	3	2.6
Earthquake	1	2	2	1.6
Extreme Heat	2	1	1	1.3
Drought	1	1	1	1.0
Wildfire/Urban Fire	1	2	2	1.6
Natural Contaminants	1	1	2	1.3
HazMat Spills	1	2	1	1.3
Terrorism	2	2	2	2.0
Public Health	2	1	1	1.3

#### Table III-12: COMMITTEE ASSESSMENT OF VULNERABILITY

# Assessing Risk

The averages of each vulnerability and probability were multiplied to arrive at the overall risk the hazard has on the community. The overall risk or threat posed by a hazard over the next 25 years was determined to be high, medium, or low. Table III-12 provides the result of this evaluation.

HIGH (3): There is strong potential for a disaster of major proportions during the next 25 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 25 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the Town's emergency management training and exercise program.

MEDIUM (2): There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate this hazard. This hazard should be included in the Town's emergency management training and exercise program.

LOW (1): There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate this hazard. This hazard need not be specifically addressed in the Town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

Hazards	Probability based on Committee Review	Vulnerability based on Committee Review	Risk Rating (Probability x Vulnerability)	Risk
Dam Failure	1	2.3	2.3	Low/Medium
Flooding	2	1.3	2.6	Low/Medium
Hurricane	2	2.6	5.2	Medium
Tornado/Downburst	2	2.0	4.0	Medium
Thunderstorm	3	1.0	3.0	Low/Medium
Erosion	3	1.0	3.0	Low/Medium
Severe Winter	3	2.6	7.8	Medium/High
Earthquake	1	1.6	1.6	Low
Extreme Heat	3	1.3	3.9	Low/Medium
Drought	2	1.0	2.0	Low/Medium
Wildfire/Urban Fire	3	1.6	4.8	Medium
Natural Contaminants	3	1.3	3.9	Low/Medium
Haz Mat	2	1.3	2.6	Low/Medium
Terrorism	1	2.0	2.0	Low/Medium
Public Health	1	1.3	1.3	Low
	0-1.9 Low 2-3.9 Low/	/Med 4-5.9 Medium 6-7.9 Med/I	High 8-9 High	

 Table III-13:
 RISK ASSESSMENT

# **IV. CRITICAL FACILITIES & LOCATIONS**

The Critical Facilities list identified by the Hazard Mitigation Committee is divided into three categories. The first category contains facilities needed for emergency response in the event of a disaster. The second category contains non-emergency response facilities that are not required in an event, but that are considered essential for the everyday operation of the Town of New London. The third category contains special facilities and structures that the Committee wishes to protect in the event of a disaster. All facilities could be subject to earthquakes. Most would be subject to hurricanes, tornados or downbursts and lightning or hail, and severe winter weather causing ice damage; these are included in the following tables as "Town-wide Events" since these hazards are not specific to the facility. Current values were obtained from Town tax records using the figures for main structures plus assessed value for accessory structures for 2011.

Critical Facility	Specific Hazard Vulnerability	Building Value	Comments
New London Fire Department	HazMat, Town-wide Events	\$504,000	
Highway Garage Facility	HazMat, Town-wide Events	\$470,000	
Kearsarge Regional Elementary School	Town-wide Events	\$4,300,000	Emergency Shelter
Whipple Memorial Town Hall	Town-wide Events	\$815,000	Police Station, Animal Shelter, and Warming & Cooling Station
Water Treatment Facility & Pumping Stations	Town-wide Events	\$121,000	Needed to retain potable water sources
New London Hospital	HazMat, Town-wide Events	\$9,700,000	EMS
Colby-Sawyer College Safety Department	Town-wide Events	Included in value below	
I-89 bridges	Town-wide Events	NA	Evacuation
5 state listed bridges	Town-wide Events	NA	Evacuation
County Road Bridge	Town-wide Events	NA	Evacuation
Pleasant Lake Dam	Dam Failure	NA	Dam Failure potential

Table IV-1: EMERGENCY RESPONSE FACILITIES, SERVICES & STRUCTURES

Critical Facility	Specific Hazard Vulnerability	Building Value	Comments
Tracy Memorial Library	Town-wide Events	\$1,900,000	
Transfer Station	Town-wide Events	\$152,000	
Sewage Pumping Stations	Town-wide Events	\$307,000	
New London Post Office	Town-wide Events	\$1,000,000	
Old Colby Academy Building	Town-wide Events	\$517,000	Town Offices
Elkins Post Office	Town-wide Events	\$118,000	
Gas Stations, Grocery Stores, Banks	Varies by site, Town-wide Events	NA	

## Table IV-2: NON-EMERGENCY RESPONSE FACILITIES AND SERVICES

#### Table IV-3: FACILITIES AND POPULATIONS TO PROTECT

Critical Facility	Hazard Vulnerability	Building Value
Colby Sawyer College	Town-wide Events	\$27,000,000
Hilltop Place (144 multi-family units)	Town-wide Events	\$23,400,000
Kearsarge Elementary School	Town-wide Events	\$4,300,000
Lyon Brook Senior Housing	Town-wide Events	\$5,300,000
Bittersweet Housing	Town-wide Events	\$1,200,000
Woodcrest Village Housing	Town-wide Events	\$3,000,000
Highland Ridge Housing	Town-wide Events	\$18,100,000

#### Table IV-4: HAZARD-PRONE AREAS AND THEIR DEVELOPMENT POTENTIAL

Critical Facility	Hazard Vulnerability	Building Value
None	Town-wide Events	NA

*Note:* See Chapter II – None of potential developable areas are subject to particular hazard vulnerability.

# V. DETERMINING HOW MUCH WILL BE AFFECTED

# A. IDENTIFYING VULNERABLE FACILITIES

It is important to determine which critical facilities and other structures are the most vulnerable and to estimate potential losses. The first step is to identify the facilities most likely to be damaged in a hazard event. To do this, the locations of critical facilities were compared to the location of past and potential hazard events. Facilities and structures located in federally and locally determined flood areas, wildfire prone areas, etc. were identified and included in the analysis. There are neither large land areas slated for potential development nor large development projects in the works, so vulnerability of undeveloped land was not analyzed. Most changes from the original plan are due to better mapping availability for floodplain location determination.

Area	Hazard	Critical Facilities	Buildings	Infrastructure	Total Known Bldg Value
FEMA designated 100 year flood zones	Flooding	None	123 residential buildings (108 homes, 15 outbuildings exclusively); 2 buildings at Twin Lakes Village	Stoney Brook Road, Bog Road, County Road, Andover Road, Lighthouse View Road, Pine Brook Road, Owl's Nest Road, Elkins Road	Residential - \$41.6 million; Commercial - \$110,000
Pleasant Lake Dam Inundation Area	Dam Failure	None	7 residential buildings	Elkins Road, Wilmot Center Road	\$1.1 million

#### Table V-1: VULNERABILITY OF EXISTING STRUCTURES, INFRASTRUCTURE, AND NATURAL RESOURCES

# B. IDENTIFYING VULNERABLE SPECIAL POPULATIONS

There are centers of special populations in as identified in Table IV-3. The elderly and physically or mentally impaired residents are also located within the community, but scattered throughout the Town in their homes. Town-wide programs will have to take this into account. Town officials having knowledge of its residents will assist in protection of those with special needs.

# C. POTENTIAL LOSS ESTIMATES

This section identifies areas in the town that are most vulnerable to hazard events and estimates potential losses from these events. It is difficult to ascertain the amount of damage caused by a natural hazard because the damage will depend on the hazard's extent and severity, making each hazard event quite unique. In addition, human loss of life was not included in the potential loss estimates, but could be expected to occur. FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses* (August 2001) was used in estimating loss evaluations. The value of structures was determined by using Town records. The Town's tax maps were used to determine number of units within each hazard area. The land damage cost, structure content loss costs, and function loss cost were not determined.

#### Dam Failure – Low/Medium Risk – \$300,000 Estimated Cost

There are seven residences within the dam inundation area within New London. The value of these buildings is estimated at \$1.1 million. Assuming a 28% structural damage, the estimated damage cost would be \$300,000.

### Flooding – Low/Medium Risk – \$11.6 Million Estimated Cost

There are 123 single-family houses and camps within the FEMA designated Special Flood Hazard areas. This includes 108 residential buildings with associated outbuildings and 15 outbuildings only with no residential building within the flood zone. There are also two buildings belonging to Twin Lakes Village. The total value of these structures is about \$41.6 million. There are no mobile homes or multi-family homes within these flood hazard areas. Assuming a 28% structural damage to the residential and commercial structures, the damage could total close to \$11.6 Million.

### Hurricane – Medium Risk – No Recorded or Estimated Cost

It is random which structures would be impacted and how much. There is no standard loss estimation available and no record of past costs.

# Tornado & Downburst - Medium Risk - No Recorded or Estimated Cost

Tornadoes, downbursts, and microbursts are relatively uncommon natural hazards in New Hampshire. On average, about six tornado events strike each year. In the State of NH, the average annual cost of tornadoes between 1950 and 1995 was \$197,000 (The Disaster Center). These wind events occur in specific areas, so calculating potential Town-wide losses is not possible. There is no standard loss estimation model available for tornadoes due to their random nature.

### Thunderstorm/Lightning/Hail - Low/Medium Risk - No Recorded or Estimated Cost

According to the Federal Alliance for Safe Homes, in an average year, hail causes more than \$1.6 billion worth of damage to residential roofs in the United States, making it, year in and year out, one of the most costly natural disasters. Lightning is one of the most underrated severe weather hazards, yet it ranks as the second-leading weather killer in the United States. More deadly than hurricanes or tornadoes, lightning strikes in America each year killing an average of 73 people and injuring 300 others, according to the National Weather Service. There is no cost estimation model for thunderstorms due to their random nature.

#### Erosion – Low/Medium Risk – Estimated Average \$8,500 Year

Over the years, the Town of New London has spent a substantial amount of money on road improvement and repair due to erosion. The Highway Department estimates that the Town spends about an average of \$8,500 per year on erosion damage to their roads not including catastrophic events.

### Severe Winter Weather – Medium/High Risk – No Estimated Costs

Ice storms often cause widespread power outages by downing power lines, and these storms can also cause severe damage to trees. New England usually experiences at least one or two severe snowstorms, with varying degrees of severity, each year. All of these impacts are a risk to the community and put all residents, especially the elderly, at risk.

According to a study done for the Institute for Catastrophic Loss Reduction (Canada) and the Institute for Business and Home Safety (U.S.), the 1998 Ice Storm inflicted \$1.2 billion (U.S.) worth of damage in the U.S. and Canada. In New Hampshire alone, over 67,000 people were without power (<u>http://www.meteo.mcgill.ca/extreme/Research\_Paper\_No\_1.pdf</u>). The U.S. average insurance claim was \$1,325 for personal property, \$1,980 for commercial property, and \$1,371 for automobiles.

#### Earthquake – Low Risk – \$66 Million Estimated Cost

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and precipitate landslide and flash flood events. Four earthquakes in NH between 1924 and 1989 had a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia, and one near the Quebec border. Buildings in New London have not been subject to any seismic design level requirement for construction and would be susceptible to structural damage. The dams, bridges, and roads would be vulnerable to a sizable earthquake event.

FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Costs*, August 2001 provides that an earthquake with a 5% peak ground acceleration (as determined by the US Geologic Survey for the area) could cause damage to single family residences by around 10% of the structural value. The total value of all building within New London is about \$659 million. If all buildings in New London were impacted by an earthquake, the estimated damage could be around \$66 million.

#### Extreme Heat – Low/Medium Risk – No Recorded or Estimated Cost

Excessive heat kills more people in the U.S. than tornadoes, hurricanes, floods, and lightning combined. The elderly, very young, obese and those who work outdoors or have substance abuse problems are most at risk from succumbing to heat. Additionally, people in urban areas are more susceptible as asphalt and cement tend to hold in heat throughout the night (Federal Alliance of Safe Homes website). New London is a rural town, but with a substantial summer population; however, extreme heat is still an issue for most residents. The costs for this hazard are in terms of human suffering. It is not anticipated that there would be any structural or infrastructure costs.

#### Drought – Low/Medium Risk – No Recorded or Estimated Cost

A long drought would cause damage to crops and dry up wells. There is no cost estimate for this hazard in New London.

#### Wildfire/Urban Fire – Medium Risk – No Estimated Cost

The risk of fire is difficult to predict based on location. About 44% of the Town is in the current use taxation program for larger lots that are forested. Forest fires are more likely to occur during drought years. In addition, areas and structures that are surrounded by dry vegetation that has not been suitably cleared are at high risk. Fire danger is generally universal, however, and can occur practically at any time. Dollar damage would depend on the extent of the fire and the number and type of buildings burned. Since the entire developed area of New London interfaces with forest, all structures are potentially vulnerable to wildfire. According to the Grafton County Forester, there are no reliable figures for the value of timber in New Hampshire; and excluding the last big fires of the early 1940s, the acres and timber values affected by fires would not be supportive of major investment in fire prevention in this region (v. fire-prone western regions)

A lightning fire in the northern part of town on July 21, 2012 was contained to two acres. The cost was \$5,000 to the Town of New London including payment to one other responding town. Several other towns responded, but did not charge for their services. There were a total of 57 people responding to the fire. Actual cost was substantially greater than the \$5,000.

#### Natural Contaminants - Low/Medium Risk - No Recorded or Estimated Cost

The cost of a natural contamination hazard would be the health of individuals exposed to the contaminant. No cost estimate is provided for this hazard.

# Hazardous Material Spills – Low/Medium for On-Site Spills and for Transportation Spills Risk – No Recorded or Estimated Cost

The cost of a hazardous material spill would depend upon the extent of the spill, the location of the spill in relation to population, structures, infrastructure, and natural resources, as well as the type of hazardous material. The cost of any clean-up would be imposed upon the owner of the material. However, other less tangible costs such as loss of water, soil, and air quality might be borne by the community. No cost estimate has been provided for this possible hazard. There are no significant hazardous waste generators in New London so any spills would be from heating fuel delivery or transport of materials through the Town on Routes 114, 11, and 103A. These are major transportation routes in the area.

### Terrorism Risk – Low/Medium Risk - No Recorded or Estimated Cost

The cost of any terrorism event is unpredictable and not estimated in this document.

# Public Health Risk - Low Risk - No Recorded or Estimated Cost

The cost of any public health hazard or contagious disease is unpredictable and not estimated in this document.

# VI. EXISTING MITIGATION ACTIONS

The next step involves identifying existing mitigation actions for the hazards likely to affect the Town and evaluating their effectiveness. Table VI-1 is a list of current policies, regulations and programs in the Town of New London that protect people and property from natural and human-made hazards as well as effectiveness and proposed improvements. Note that in the fifth column, the proposed improvements proposed in the 2006 plan are listed followed by what actions were taken or not taken to implement those proposed improvements. Proposed improvements are shown in red. Table VI-2 are the road projects.

Existing Mitigation Action & Description	Service Area/Hazard Type	Responsible Local Agent	Effective- ness (Low, Average, High)	2008 Plan Proposed Improvements/Changes from 2008 Hazard Mitigation Plan	2012 Proposed Improvements or Update
National Flood Insurance Program – Provide program for affordable flood insurance	Entire Town/Flooding	Land Use Coordinator	Average	Work with FEMA to update floodplain maps/Maps were updated in 2008 by FEMA though not significantly	Continue participation in program.
NH Shoreland Protection Act – Protect shoreland from development encroachment	Entire Town/Shoreland	Zoning Administrator	r High No proposed improvement. 2008 plan		This is a State law that the Town will continue to enforce
<b>NH Wetlands Protection</b> – Protects all wetlands	Entire Town/ Flooding	Zoning Administrator	High	No proposed improvements in 2008 plan	This is a State law that the Town will continue to enforce
NH Dam Emergency Action Plans – Town-owned Pleasant Lake Dam	Elkins Village area & towns downstream/Da m Failure	Emergency Management Director	High	No proposed improvements in 2008 plan	Continued evaluation of newly developed EAP
NH Statewide Building Code – Provides minimum building requirements for safety	Entire Town/Fire	Zoning Administrator	Average	Consider adopting the International Building Code /chose not to adopt as no professional building inspector	Will continue to enforce State building codes for multi-family, public, and commercial buildings

#### Table VI-1: EXISTING MITIGATION ACTIONS

Existing Mitigation Action & Description	Service Area/Hazard Type	Responsible Local Agent	Effective- ness (Low, Average, High)	2008 Plan Proposed Improvements/Changes from 2008 Hazard Mitigation Plan	2012 Proposed Improvements or Update		
Utility Lines – Put lines in downtown area underground	Downtown/Wind & Winter Events	Select Board	NA	Gathering cost information for this action was recommended in the 2008 plan/The cost was determined to be prohibitive.	This action line item will be deleted in the next plan update.		
<b>Local Emergency Operations</b> <b>Plan</b> – A document to prepare the town for all emergencies	Entire Town/All Hazards	Emergency Management Director	High	No proposed improvements in 2008 plan	The plan is in the process of being updated		
Emergency Shelter – Emergency shelter at the Kearsarge Regional Elementary School	Entire Town/All Hazards	Emergency Management Director	High	Replace temporary generator with permanent one; work on getting second primary shelter at First Baptist Church			
Emergency Communication – System to communicate with the public and emergency service organizations; set up at college with prerecorded emergency information; sign board; ham operators assigned to emergency facilities; Code Red phone system	Entire Town/All Hazards	Emergency Management Director	High	New mitigation entry since 2008 plan	The Committee will continue to evaluate these systems for future effectiveness.		
Radio Communication – Emergency departments communications from Emergency Operations Center at town hall	Entire Town/All Hazards	Police Chief	High New mitigation entry since 2008 plan		High New mitigation entry since plan		Add three simulcast repeaters (applied for Homeland Security Interoperability Grant)
<b>Emergency Power</b> – Provide power for heat and water during emergencies and power outages	Entire Town/All Hazards	Emergency Management Director	Average	New mitigation entry since 2008 plan	Install permanent generators at First Baptist Church and Highway Garage; college plans to install a few		

Existing Mitigation Action & Description	Service Area/Hazard Type	Responsible Local Agent	Effective- ness (Low, Average, High)	2008 Plan Proposed Improvements/Changes from 2008 Hazard Mitigation Plan	2012 Proposed Improvements or Update
<b>Conservation Fund for Land</b> <b>Protection</b> – Purchase critical properties	Entire Town/All Hazards	Conservation Commission	Average	No proposed improvements in 2008 plan	The Conservation Commission will continue to evaluate properties including hazard-mitigating properties such as wetlands for conservation.
<b>Tree Cutting</b> – Remove hazardous trees and limbs after wind events; Tree City USA	Entire Town/Wind Events & Severe Winter; Wildfire	Tree Warden	High	No proposed improvements in 2008 plan	The Tree Warden will continue to monitor annually and after weather events.
Forest Management Plans – Currently plan for Phillips Preserve	Town Forest/Severe Wind Events & Wildfire	Conservation Commission	High	Develop plans for each town properties/a plan has been done for Low Plain Natural Area	The Clark Pond Conservation Area and the Colby Sanctuary will be evaluated for timber value and if a forest management plan should be done.
HazMat Mutual Aid – Midwestern Regional HazMat Team towns provide/ receive mutual aid in emergencies	Entire Town/Haz Mat Spills	Fire Chief	Average	Wind modeling & evacuation plan along I-89/not completed due to lack of resources; develop list of needs for liquid spill containment and pursue grants for purchase/done through mutual aid	Develop wind modeling, drainage, & evacuation plan along I-89
<b>Stormwater Infrastructure</b> <b>Inventory</b> – Determine adequacies of culvert and other stormwater structures	Entire Town/Flooding & Erosion	Public Works Director	Average	Map stormwater infrastructure system/Only partially completed through NOAA project due to lack of resources	Map remainder of stormwater infrastructure.
<b>Town Highway &amp; Winter</b> <b>Operations Plan</b> – Determine priority for snow removal	Entire Town/Winter	Public Works Director	Average	Adopt winter highway maintenance program/Adopted plan	The Public Works Director will continue to evaluate the plan for future effectiveness.

Existing Mitigation Action & Description	Service Area/Hazard Type	Responsible Local Agent	Effective- ness (Low, Average, High)	2008 Plan Proposed Improvements/Changes from 2008 Hazard Mitigation Plan	2012 Proposed Improvements or Update
Road & Bridge Improvement Program -	Entire Town/ Erosion	Public Works Director	Average	No proposed improvements in 2008 plan although page 12 notes annual flooding on Stoneybrook Road, Bog Road, Forest Acres Road (upsized culverts in 2009- 09), Lamson Lane (replaced culvert in 2010) and others noted on the 2008 map	Stoney Brook Road and Bog Road were not addressed due to the difficulty of the flooding problems; they are addressed in the next table. Lamson Lane is currently having ditch and culvert work using a grant. See list in next table.
<b>Highway Mutual Aid</b> – Member towns provide and receive aid in emergency	Entire Town/All Hazards	Public Works Director	High	No proposed improvements in 2008 plan	The Town will continue to participate in the highway mutual aid program.
<b>Fire Department</b> – About 43 on-call volunteers and two full- time employees; pickup and trailer for wildland fires	Entire Town/Wildfire and Urban Fire	Fire Chief	High	No proposed improvements in 2008 plan	Produce more detailed maps of access (e.g. logging roads) to reach undeveloped areas in case of wild fire; monitor road maintenance needs to keep roads open
<b>Fire Mutual Aid</b> – 14 member towns of Kearsarge Mutual Aid provide and receive aid during emergencies	Entire Town/All Hazards	Fire Chief	High	New mitigation entry since 2008 plan	The town will continue to participate in the mutual aid program
<b>Fire Safety Boat</b> – Boat w/40 hp motor for emergencies; stored on trailer for transport	Lake Sunapee structures/All Hazards	Fire Chief	High	New mitigation entry since 2008 plan	Purchase larger 60 horse power motor to better carry divers and their equipment
<b>Police Department</b> – Chief, seven full-time officers, and five part- time officers	Entire Town/All Hazards	Police Chief	High	New mitigation entry since 2008 plan	The Police Chief will continue to develop training programs as needed.
Safety Services Call List– List to call senior citizens & special needs	Entire Town/All Hazards	Fire Chief & Police Chief	Average	New mitigation entry since 2008 plan	Continue to update the list through voluntary listing in the Code Red Program. Note: Because listing though the Code Red program is voluntary, the list is incomplete. Names added from previous

Existing Mitigation Action & Description	Service Area/Hazard Type	Responsible Local Agent	Effective- ness (Low, Average, High)	2008 Plan Proposed Improvements/Changes from 2008 Hazard Mitigation Plan	2012 Proposed Improvements or Update		
					emergencies are often outdated.		
<b>Police Mutual Aid</b> – Member towns provide and receive aid during emergencies	Entire Town/All Hazards	Police Chief	High	No proposed improvements in 2008 plan	The Town will continue to participate in the mutual aid program.		
Water Use Restrictions – Limits water use during dry conditions	Middle of town on water system/Drought	Springfield/ New London Water Precinct Officer	High No proposed improvements in 2008 plan		The Precinct will continue to monitor drought conditions and will enforce water use limitations as needed.		
<b>Town Master Plan</b> – Addresses hazard mitigation	Entire Town/All Hazards	Planning Board	Average	The hazard mitigation plan and emergency operation plan will be referenced in the latest Master Plan Summary			
Zoning Ordinance – Restricts development in Shoreland; setback from streams; wetland buffer; no building or clear cutting on steep slopes; no new development in flood zones	Entire Town/Flooding, Erosion	Planning Board	High	No proposed improvements in 2008 plan	The Planning Board will continue to evaluate the zoning ordinance for effectiveness in the future.		
Subdivision Regulations – Regulates subdivisions; provides stormwater restrictions for new development; requires fire protection	Entire Town/All Hazards	Planning Board	High	Require second egress for developments in hazard sensitive areas/not done as determined not to be a priority	Continue to require subdivisions within the water precinct to install hydrants		
Site Plan Review Regulations – Regulates multi-family and non-residential development; requires fire safety measures	Entire Town/All Hazards	Planning Board	High	New mitigation entry since 2008 plan	The Planning Board will continue to evaluate the regulations for effectiveness in the future.		
Capital Improvement Program – Plan for purchase of emergency equipment	Entire Town/All Hazards	Planning Board	High	No proposed improvements in 2008 plan	The various departments will continue to include emergency capital purchases in the CIP		
Animal Shelter – Cat and dog shelter during emergencies provided in Whipple Hall	Entire Town/All Hazards	Animal Shelter Director	High	New mitigation entry since 2008 plan	Coordinate efforts with the Upper Valley Humane Society		

Existing Mitigation Action & Description	Service Area/Hazard Type	Responsible Local Agent	le ness 2008 Plan Proposed (Low, Improvements/Changes fr Average, 2008 Hazard Mitigation I High)		2012 Proposed Improvements or Update
Educational Outreach Program – Public outreach to seasonal and year-round residents for hazard event preparation	Entire Town/All Hazards	Emergency Management Director and Town Administrator	High	Prepare stock public notice for storm preparation for WNTK/done, also on town-owned station; education packet given out to all households in 2011 and at town meetings; notices in paper & town web page; provided public workshop in 2010	Continue providing public education information.

#### Table VI-2: ROAD IMPROVEMENTS PROGRAM – PROPOSED IMPROVEMENTS

Location/Hazard	Problem	Mitigation Action
Bog Road at Messer Pond	Floods and erodes once every several years	Replace culvert with larger culvert
Stoney Brook Road	Floods and erodes most springs	Stabilize both sides of the road with large rock so
		shoulders will not wash
Columbus Avenue	Flat, swampy area that floods and erodes each	Upsize culverts, raise road, and stabilize shoulders
	spring	with rock

The Committee developed Table VI-3 to examine the proposed improvements and evaluate them as 1: Low; 2: Average; and 3: High for effectiveness looking at several criteria as shown in the table. The totals are then ranked to prioritize the improvements to help the Committee focus on the most effective strategy improvements. Proposed strategies with total scores of 22-24 are considered to be highly beneficial improvements and total scores of 18-21 are considered moderately beneficial improvements.

It is important to note that the following scoring system is a method recommended by the Federal Emergency Management Agency to prioritize hazard mitigation activities after an event occurs rather than in preparation for an event—or emergency management. However, the Town of New London recognizes the importance of emergency management as part of hazard mitigation as shown by their goals in Chapter I. and VII. Although proposed emergency management activities score lower in this hazard mitigation system, they are by no means of lower priority to the Town. The Emergency Management Committee stated that the preparation of emergency shelters with appropriate systems including permanent generators is a high priority for the Town.

# Table VI-3: PRIORITIZING EXISTING MITIGATION STRATEGY IMPROVEMENTS

Rank	Strategy Improvement	Reduce Damage	Community Objectives	Existing Regulations	Quickly Implemente	Socially Acceptable	Technically Feasible	Admin Possible	Benefit - Cost	TOTAL SCORE	Mitigate Existing or New Dev
1	HazMat Mutual Aid - Develop wind modeling, drainage, & evacuation plan along I-89	3	3	3	3	3	3	3	3	24	Both
1	<b>Fire Department</b> - Produce more detailed maps of access (e.g. logging roads) to reach undeveloped areas in case of wild fire; monitor road maintenance needs to keep roads open	3	3	3	3	3	3	3	3	24	Both
2	Bog Road at Messer Pond - Replace culvert with larger culvert	3	3	3	2	3	3	3	3	23	Both
2	<b>Stoney Brook Road</b> - Stabilize both sides of the road with large rock so shoulders will not wash	3	3	3	2	3	3	3	3	23	Both
2	<b>Columbus Avenue</b> - Upsize culverts, raise road, and stabilize shoulders with rock	3	3	3	2	3	3	3	3	23	Both
3	Stormwater Infrastructure - Map remainder of stormwater infrastructure	2	3	3	2	3	3	3	3	22	Both
3	<b>Fire Safety Boat</b> - Purchase larger 60 horse power motor to better carry divers and their equipment	2	3	3	2	3	3	3	3	22	Both
3	<b>Town Master Plan</b> - The hazard mitigation plan and emergency operation plan will be referenced in the latest Master Plan Summary	1	3	3	3	3	3	3	3	22	Both
3	Animal Shelter - Coordinate efforts with the Upper Valley Humane Society	1	3	3	3	3	3	3	3	22	Both
4	<b>Forest Management Plans</b> - The Clark Pond Conservation Area and the Colby Sanctuary will be evaluated for timber value and if a forest management plan should be done	1	3	3	3	3	3	3	2	21	Both
5	<b>Emergency Shelter</b> - Work on getting second primary shelter at First Baptist Church	1	3	3	1	3	3	3	3	20	Both
5	Radio Communication - Add three simulcast repeaters	2	3	2	2	2	3	3	3	20	Both
5	<b>Emergency Power</b> - Install permanent generators at First Baptist Church, and Highway Garage	2	3	2	2	3	3	2	3	20	Both
6	Emergency Shelter - Replace temporary generator with permanent one	1	3	2	2	3	3	2	3	19	Both

# VII. GOALS AND NEWLY IDENTIFIED MITIGATION ACTIONS

# A. GOALS

The New London Hazard Mitigation Committee reviewed its goals and developed objectives to meet these goals. The goals and objectives were re-evaluated during the updating of the plan to insure they remain valid and effective.

# Goals

- To identify, introduce and implement cost effective Hazard Mitigation measures so as to accomplish the Town's goals and to raise awareness and acceptance of hazard mitigation opportunities generally.
- 2. To improve upon the protection of the general population, the citizens, and visitors of the Town of New London from natural and human-made hazards.
- 3. To reduce the potential impact of natural and human-made disasters to:
  - the Town of New London's Critical Support Services,
  - Critical Facilities in the Town of New London,
  - the Town of New London's infrastructure,
  - private property,
  - the Town's economy,
  - the Town's natural environment, and
  - the Town's specific historic treasures and interests.
- 4. To improve the Town's Disaster Response and Recovery Capability as a hazard mitigation strategy to be prepared for emergencies and reduce their impact.

# **B. POTENTIAL MITIGATION ACTIONS**

#### **Summary of New Strategies**

The New London Hazard Mitigation Committee brainstormed potential mitigation actions at a meeting. The proposed measures are organized by the type of hazard event that the mitigation action is expected to mitigate. Some actions have been moved to the existing actions table as noted in that table. Other items have been deleted as they are no longer deemed appropriate, e.g. proposed actions for infrastructure not in control of New London. A note in parentheses tells if the action is remaining from the previous plan and why or if it is new.

#### Table VII-1: PROPOSED NEW MITIGATION ACTIONS

Proposed New Mitigation Description	Service Area/ Hazard Type	Responsible Local Agent	If Recommended in 2008 Plan, why was it not put into place?
<b>Drinking Water Assessments</b> – Test private and public water systems for safety after stormwater infiltration; develop emergency agreement with the Lake Sunapee Protective Association to use their lab and personnel at Colby Sawyer College	Entire Town/All Hazards	Health Officer	New mitigation entry since 2008 plan
<b>Commercial Outreach for Emergency Planning</b> – Work with businesses especially those dealing with food to prepare for electrical outages (e.g. install generator, donate food before it spoils, disposal of spoiled food)	Entire Town/All Hazards	Health Officer	New mitigation entry since 2008 plan
<b>Septic System Failure Checks</b> – Check septic systems for failure after flooding.	Entire Town/Flooding	Health Officer	New mitigation entry since 2008 plan

# C. SUMMARY OF CRITICAL EVALUATION

The New London Hazard Mitigation Committee reviewed each of the newly identified mitigation strategies using the following factors:

- Does it reduce disaster damage?
- Does it contribute to community objectives?
- Does it meet existing regulations?
- Can it be quickly implemented?

- Is it socially acceptable?
- Is it technically feasible?
- Is it administratively possible?
- Does the action offer reasonable benefits compared to cost of implementation?

Each mitigation strategy was evaluated and assigned a score (High -3; Average -2; and Low -1) based on the criteria. The New London Hazard Mitigation Committee assigned the following scores to each strategy for its effectiveness related to the critical evaluation factors listed above, and actions had the following scores, with the highest scores suggesting the highest priority. . Proposed strategies with total scores of 22-24 are considered to be highly beneficial improvements; total scores of 18-21 are considered moderately beneficial improvements; and total scores of 17 or less are considered lowest beneficial improvements.

Rank	Strategy	Reduce Damage	Community Objectives	Existing Regulations	Quickly Implemented	Socially Acceptable	Technically Feasible	Administratively Possible	Benefit - Cost	TOTAL SCORE	Mitigate Existing or New Development or Both
	<b>Drinking Water Assessments</b> – Test private and public water systems for safety after stormwater infiltration; develop emergency agreement with the Lake Sunapee Protective Association to use their lab and personnel at Colby Sawyer College	2	3	3	3	3	3	3	3	23	Both
	<b>Commercial Outreach for Emergency Planning</b> – Work with businesses especially those dealing with food to prepare for electrical outages (e.g. install generator, donate food before it spoils, disposal of spoiled food)	2	3	3	3	3	3	3	3	23	Both
	Septic System Failure Checks – Check septic systems for failure after flooding.	2	3	3	3	3	3	3	3	23	Both

#### Table VII-2: PRIORITIZING PROPOSED MITIGATION STRATEGIES

# VIII. PRIORITIZED IMPLEMENTATION SCHEDULE

The New London Hazard Mitigation Committee created the following action plan for implementation of priority mitigation strategies:

Mitigation Action	Who (Leadership)	When (Year)	How (Funding Sources)	Cost (Estimated)
Emergency Shelter - Replace temporary generator with permanent one	Emergency Management Director (EMD)	2013	Grants	\$35-50,000
<b>Emergency Shelter</b> - Work on getting second primary shelter at First Baptist Church	EMD	2012	NA	0
Radio Communication - Add three simulcast repeaters	Police Chief	2012	Grants	\$800,000
<b>Emergency Power</b> - Install permanent generators at Kearsarge Elementary School, First Baptist Church, and Highway Garage	EMD	2013-2014	Grants	\$50-60,000
<b>Forest Management Plans</b> - The Clark Pond Conservation Area and the Colby Sanctuary will be evaluated for timber value and if a forest management plan should be done	Conservation Commission	2014-1015	Taxes	\$3-5,000
HazMat Mutual Aid - Develop wind modeling, drainage, & evacuation plan along I-89	Fire Chief	2012-2013	Taxes	\$3-5,000
Stormwater Infrastructure - Map remainder of stormwater infrastructure	Public Works Director	2013-2014	Taxes	\$5,000
<b>Fire Department</b> - Produce more detailed maps of access (e.g. logging roads) to reach undeveloped areas in case of wild fire; monitor road maintenance needs to keep roads open	Fire Chief	2013-2014	Taxes	\$3-5,000
<b>Fire Safety Boat</b> - Purchase larger 60 horse power motor to better carry divers and their equipment	Fire Chief	2015	Donations	\$5-7,000
<b>Town Master Plan</b> - The hazard mitigation plan and emergency operation plan will be referenced in the latest Master Plan Summary	Town Administrator	2012	NA	NA
Animal Shelter - Coordinate efforts with the Upper Valley Humane Society	Animal Shelter Director	2012	Donations	NA
Bog Road at Messer Pond - Replace culvert with larger culvert	Public Works Director	2012	Taxes & Grants	\$15,000
Stoney Brook Road - Stabilize both sides of the road with large rock so shoulders will not wash	Public Works Director	2013	Taxes & Grants	\$8,000
<b>Columbus Avenue</b> - Upsize culverts, raise road, and stabilize shoulders with rock	Public Works Director	2014-2015	Taxes & Grants	\$35,000

Table VIII-VIII-1: PRIORITIZED IMPLEMENTATION SCHEDULE FOR EXISTING PROGRAM IMPROVEMENTS

Mitigation Action	Who (Leadership)	When (Year)	How (Funding Source)	Cost
<b>Drinking Water Assessments</b> – Test private water systems for safety after stormwater infiltration; develop emergency agreement with the Lake Sunapee Protective Association to use their lab at Colby Sawyer College	Health Officer	2012	NA	0
<b>Commercial Outreach for Emergency Planning</b> – Work with businesses especially those dealing with food to prepare for electrical outages (e.g. install generator, donate food before it spoils, disposal of spoiled food)	Health Officer	2012	NA	0
<b>Septic System Failure Checks</b> – Check septic systems for failure after flooding.	Health Officer	2012	NA	0
2012				

# Table VIII-VIII-2: IMPLEMENTATION SCHEDULE FOR PROPOSED MITIGATION ACTIONS

# IX. ADOPTION & IMPLEMENTATION OF THE PLAN

A good plan needs to provide for periodic monitoring and evaluation of its successes and challenges, and to allow for updates of the Plan where necessary. In order to track progress and update the Mitigation Strategies identified in the Plan, the Town of New London will revisit the Hazard Mitigation Plan annually, or after a hazard event. The New London Emergency Management Director will initiate this review and will consult with the Hazard Mitigation Committee. Changes will be made to the plan to accommodate for projects that have failed, or that are not considered feasible after a review for their consistency with the evaluation criteria, the timeframe, the community's priorities, and funding resources. Priorities that were not ranked highest, but that were identified as potential mitigation strategies, will be reviewed as well during the monitoring and update of this plan. The plan will be updated and submitted for FEMA approval at a minimum every five years as required by the Disaster Mitigation Act 2000.

# A. IMPLEMENTATION THROUGH EXISTING PROGRAMS

The Plan will be adopted locally and referenced in the updated Emergency Operations Plan (EOP), and it will be updated annually along with the EOP. In addition, the Planning Board and Board of Selectmen, during the Capital Improvement Process, will review and include any proposed structural projects outlined in this plan, as appropriate. As other Town documents are updated, they will include consideration of the hazard risks and mitigation strategies from this plan. This would include the Town Master Plan.

# **B. CONTINUED PUBLIC INVOLVEMENT**

The public will continue to be involved in the hazard mitigation planning process. In future years, a public meeting will be held (separate from the adoption meeting) to inform and educate members of the public and to take public comment for incorporation into any updates of the plan. Additionally information will be posted on the Town website.

The public will continue to be provided with the opportunity to participate in hazard mitigation planning through public meetings and the town meeting when explaining programs and expenses. Town boards and the school will be alerted to the updated hazard mitigation plan for review prior to amending town regulations, ordinances, and plans.

Copies of future updated Hazard Mitigation Plans will be sent to the following parties for review and comment: Emergency Management Directors, neighboring towns; Field Representative, NH Homeland Security & Emergency Management; New London Board of Selectmen and Planning Board; Upper Valley Lake Sunapee Regional Planning Commission

# **RESOURCES USED IN THE PREPARATION OF THIS PLAN**

*Guide to Hazard Mitigation Planning for New Hampshire Communities*, prepared for NH Bureau of Emergency Management (now NH Homeland Security & Emergency Management) by the Southwest Regional Planning Commission (October 2002)

Local Mitigation Plan Review Guide, FEMA (October 1, 2011)

FEMA Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000 (March 2004, Last Revised June 2007)

FEMA 386-1 Getting Started: Building Support for Mitigation Planning (September 2002)

FEMA 386-2 Understanding Your Risks: Identifying Hazards and Estimating Costs (August 2001)

FEMA 386-3 Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies (April 2003)

*Ice Storm '98* by Eugene L. Lecomte et al for the Institute for Catastrophic Loss Reduction (Canada) and the Institute for Business & Home Safety (U.S.) (December 1998)

Lucey, Bernie, P.E. NH Department of Environmental Services, Drinking Water & Groundwater Bureau, Phone Discussion 01/29/08

Town of New London Emergency Operations Plan (2006)

*Town of New London Master Plan* (2011)

NH Department of Environmental Services, Drinking Water & Groundwater Bureau Fact Sheets: ARD-EHP-22 Radium, Radon, and Uranium: Health Information Summary (2007); WD-WSEB-3-11 Dissolved Mineral Radioactivity In Drinking Water (2004); WD-WSEB-2-1 Suggested Water Quality Testing for Private Wells (2003)

NH Homeland Security & Emergency Management, State of New Hampshire Multi-Hazard Mitigation Plan (October 2010)

www.fema.gov/news/disasters.fema: Website for FEMA's Disaster List (last visited 11/29/11)

<u>www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms</u>: Website for National Oceanic & Atmospheric Administration Disaster List (last visited 11/29/11)

www.tornadoproject.com: Website for The Tornado Project (last visited 11/29/11)

www.crrel.usace.army.mil/: Website for Cold Regions Research and Engineering Laboratory Website (CRREL) (last visited 11/29/11)

www.nesec.org: Website for Northeast States Emergency Consortium (last visited 11/29/11)

<u>http://earthquake.usgs.gov/earthquakes/states/index.php?regionID=29</u> : Website for area earthquake information (last visited 11/29/11)

www.bc.edu/research/westonobservatory/: Northeast earthquake data (last visited 11/29/11)

# **APPENDICES**

- Appendix A: Technical Resources
- Appendix B:Hazard Mitigation Assistance Grants
- Appendix C: Meeting Documentation
- Appendix D: Map of Past and Potential Hazard Event Areas and Critical Facilities
- Appendix E: FEMA Approval and Town Resolution of Adoption
- Appendix F:Mutual Aid Agreement Documentation
# **APPENDIX A:**

# **TECHNICAL RESOURCES**

# 1) Agencies

New Hampshire Homeland Security & Emergency Management	
Federal Emergency Management Agency	
NH Regional Planning Commissions:	
Upper Valley Lake Sunapee Regional Planning Commission	
NH Executive Department:	
Governor's Office of Energy and Community Services	
New Hampshire Office of State Planning	
NH Department of Cultural Affairs:	
Division of Historical Resources	
NH Department of Environmental Services:	
Air Resources	
Waste Management	
Water Resources	
Water Supply and Pollution Control	
Rivers Management and Protection Program	
NH Office of Energy and Planning	
NH Municipal Association	
NH Fish and Game Department	
NH Department of Resources and Economic Development:	
Natural Heritage Inventory	
Division of Forests and Lands	
Division of Parks and Recreation	
NH Department of Transportation	
Northeast States Emergency Consortium, Inc. (NESEC)	(781) 224-9876
US Department of Commerce:	
National Oceanic and Atmospheric Administration:	

National Weather Service; Gray, Maine	
US Department of the Interior:	
US Fish and Wildlife Service	
US Geological Survey	
US Army Corps of Engineers	
US Department of Agriculture: Natural Resource Conservation Service	

# 2) Mitigation Funding Resources

NH Homeland Security & Emergency Management
NH Homeland Security & Emergency Management
NH Homeland Security, NH OEP, also refer to RPC
NH Department of Environmental Services
NH Homeland Security & Emergency Management
USDA, Natural Resources Conservation Service
NH Homeland Security & Emergency Management
US Army Corps of Engineers
NH Homeland Security & Emergency Management
NH Municipal Association
NH Office of Energy and Planning
NH Homeland Security & Emergency Management
NH Department of Transportation
US Army Corps of Engineers
NH Department of Environmental Services
NH Department of Resources and Economic Development
NH Department of Environmental Services

# † Note regarding National Flood Insurance Program (NFIP) and Community Rating System (CRS):

The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community's floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. The NH Office of State Planning can provide additional information regarding participation in the NFIP-CRS Program.

#### 3) Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/hazards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/disaster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/geog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.htm	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://www.ghcc.msfc.nasa.gov/otd.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://wwwep.es.llnl.gov/wwwep/ghp.html	General hazard information developed for the

Sponsor	Internet Address	Summary of Contents
		Dept. of Energy.
The Tornado Project Online	http://www.torpadoroject.com/	Information on tornadoes, including details of
The Tolliado I Tojeet Online	http://www.tornadorojeet.com/	recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA	http://www.jigg.jiv.com/ndoman.htm	A multi disastar rick man
Natural Disaster Risk Map	http://www.naa.nx.com/ndcmap.ntm	A multi-disaster fisk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

# Appendix B: HAZARD MITIGATION ASSISTANCE GRANTS

Hazard Mitigation Assistance (HMA) grant program of the Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) presents a critical opportunity to protect individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds. The HMA program provides pre-disaster mitigation grants annually to local communities. The statutory origins of the program components differ, but all share the common goal of reducing the loss of life and property due to natural hazards. Eligible applicants include State-level agencies including State institutions; Federally recognized Indian Tribal governments; Public or Tribal colleges or universities (PDM only); and Local jurisdictions that are participating in the National Flood Insurance Program (NFIP).

Aside from the HMA grants program, *Section 406 of the Stafford Act* of the Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. Title 44 CFR §206.226 Restoration of Damaged Facilities contains a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events. These funds can be combined with the following Hazard Mitigation Assistance Program grants to bring structures up above previous conditions to better resist future hazards.

- 1. *The Hazard Mitigation Grant Program (HMGP):* HMGP funding is available after a presidentially declared disaster and provides States with the incentive and capability to implement mitigation measures to ensure the opportunity to take critical mitigation measures to protect life and property from future disasters.
- 2. *The Pre-Disaster Mitigation (PDM) program*: This provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event as well as funding for disasters after-the-fact. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are awarded on a competitive basis.
- 3. *The Flood Mitigation Assistance (FMA) program*: This provides funds so that cost-effective measures can be taken to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under the NFIP. The long-term goal of FMA is to reduce or eliminate claims under the NFIP through mitigation activities.

- 4. *The Repetitive Flood Claims (RFC) program*: This program provides funding to reduce of eliminate the long-term risk of flood damage to structures insured by NFIP that have had one or more claim payments for flood damages. The long-term goal of the RFC program is to reduce or eliminate claims under the NFIP through mitigation activities that are in the best interest of the NFIP.
- 5. *The Severe Repetitive Loss (SRL) program*: This program provides funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss residential structures insured under the NFIP.

Potential eligible projects are shown in the following table by grant program. For further information on these programs visit the following FEMA websites:

Section 406 - http://www.fema.gov/government/grant/pa/9526 1.shtm

- HMGP http://www.fema.gov/government/grant/hma/index.shtm
- PDM www.fema.gov/government/grant/pdm/
- $FMA \underline{www.fema.gov/government/grant/fma}$
- $RFC \underline{www.fema.gov/government/grant/rfc}$
- $SRL-\underline{www.fema.gov/government/grant/srl}$

Mitigation Project:	HMPG	PDM	FMA	RFC	SRL
Property Acquisition and Demolition or					
Relocation Project					
Property Elevation	X	Χ	Χ	Χ	X
Construction Type Projects					
Property Elevation	X	Χ	Χ	X	X
Mitigation Reconstruction <sup>1</sup>					Χ
Localized Minor Flood Reduction Projects	Х	Χ	Χ	X	X
Dry Flood-proofing of Residential Property <sup>2</sup>			Χ		X
Dry Flood-proofing of Non-residential Structures			Χ	X	
Storm water Management		Χ	Χ		
Infrastructure Protection Measure		Χ			
Vegetative Management/Soil Stabilization	Х	Χ			
Retrofitting Existing Buildings and Facilities (Wind/Earthquake)	Х	Χ			
Safe room construction		Χ			
Post-disaster building code activities supporting officials during reconstruction	Х				
Non-construction Type Projects					
All Hazard/Flood Mitigation Planning		X	X		
1. The SLR Program allows Mitigation Reconstruction projects located outside the re-	egulatory floodw	ay or Zone V as	identified on th	e effective Floo	od Insurance
Rate Map (FIRM), or the mapped limit of the 1.5-foot breaking wave zone. Mitigation	on Reconstruction	n is only permitt	ed if traditional	elevation canne	ot be

implemented.

2. The residential structure must meet the definition of "Historic Structure" in 44 CFR§59.1. Source: "Hazard Mitigation Assistance Program Guidance," FEMA, June 19, 2008

# OTHER HAZARD MITIGATION ASSISTANCE FUNDING

### **Environmental Protection Agency**

The EPA makes available funds for water management and wetlands protection programs that help mitigate against future costs associated with hazard damage.

Mitigation Funding Sources	Details	Notes
Program		
Clean Water Act Section 319 Grants	Grants for water source management programs including technical assistance, financial	Funds are provided only to
	assistance, education, training, technology transfer, demonstration projects, and	designated state and tribal
	regulation.	agencies
	http://www.epa.gov/OWOW/NPS/cwact.html	
Clean Water State Revolving Funds	State grants to capitalize loan funds. States make loans to communities, individuals,	States and Puerto Rico
	and others for high-priority water-quality activities.	
	http://www.epa.gov/owow/wetlands/initiative/srf.html	
Wetland Program Development	Funds for projects that promote research, investigations, experiments, training,	See website
Grants	demonstrations, surveys, and studies relating to the causes, effects, extent, prevention,	
	reduction, and elimination of water pollution.	
	http://www.epa.gov/owow/wetlands/initiative/#financial	

#### National Oceanic and Atmosphere Administration (NOAA)

NOAA is the major source for mitigation funding related to coastal zone management and other coastal protection projects.

Mitigation Funding	Details	Notes
Sources Program		
Coastal Services	Funds for coastal wetlands management and protection, natural hazards management, public	May only be used to implement and
Center Cooperative	access improvement, reduction of marine debris, special area management planning, and ocean	enhance the states' approved
Agreements	resource planning.	Coastal Zone Management
	http://www.csc.noaa.gov/funding/	programs
Coastal Services	Formula and program enhancement grants for implementing and enhancing Coastal Zone	Formula grants require non-federal
Center Grant	Management programs that have been approved by the Secretary of Commerce.	match
Opportunities	http://www.csc.noaa.gov/funding/	
Coastal Zone	The Office of Ocean and Coastal Resource Management (OCRM) provides federal funding and	Funding is reserved for the nation's
Management Program	technical assistance to better manage our coastal resources.	34 state and territory Coastal Zone
	http://coastalmanagement.noaa.gov/funding/welcome.html	Management Programs
Marine and Coastal	Funding for habitat restoration, including wetland restoration and dam removal.	Funding available for state, local
Habitat Restoration	http://www.nmfs.noaa.gov/habitat/recovery/	and tribal governments and for- and
		non-profit organizations.

#### Update 2012

## Floodplain, Wetland and Watershed Protection Programs

USACE and the U.S. Fish and Wildlife Service offer funding and technical support for programs designed to protect floodplains, wetlands, and watersheds.

Funding and Technical Assistance	Details	Notes
for Wetlands and Floodplains		
Program		
USACE Planning Assistance to States	Fund plans for the development and conservation of water resources, dam safety, flood	50 percent non-
(PAS)	damage reduction and floodplain management.	federal match
	http://www.lre.usace.army.mil/planning/assist.html	
USACE Flood Plain Management	Technical support for effective floodplain management.	See website
Services (FPMS)	http://www.lrl.usace.army.mil/p3md-o/article.asp?id=9&MyCategory=126	
USACE Environmental Laboratory	Guidance for implementing environmental programs such as ecosystem restoration and reuse	See website
	of dredged materials.	
	http://el.erdc.usace.army.mil/index.cfm	
U.S. Fish & Wildlife Service Coastal	Matching grants to states for acquisition, restoration, management or enhancement of coastal	States only.
Wetlands Conservation Grant Program	wetlands.	50 percent federal
	http://ecos.fws.gov/coastal_grants/viewContent.do?viewPage=home	share
U.S. Fish & Wildlife Service Partners	Program that provides financial and technical assistance to private landowners interested in	Funding for
for Fish and Wildlife Program	restoring degraded wildlife habitat.	volunteer-based
	http://ecos.fws.gov/partners/viewContent.do?viewPage=home	programs

# Housing and Urban Development

The Community Development Block Grants (CDBG) administered by HUD can be used to fund hazard mitigation projects.

Mitigation Funding	Details	Notes
Sources Program		
Community	Grants to develop viable communities, principally for low and moderate income persons. CDBG funds	Disaster funds contingent
Development Block	available through Disaster Recovery Initiative.	upon Presidential disaster
Grants (CDBG)	http://www.hud.gov/offices/cpd/communitydevelopment/programs/	declaration
Disaster Recovery	Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of	Individuals
Assistance	impacted homes.	
	http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/assistance.cfm	
Neighborhood	Funding for the purchase and rehabilitation of foreclosed and vacant property in order to renew	State and local
Stabilization Program	neighborhoods devastated by the economic crisis.	governments and non-
	http://www.hud.gov/offices/cpd/communitydevelopment/programs/neighborhoodspg/	profits

#### **Bureau of Land Management**

The Bureau of Land Management (BLM) has two technical assistance programs focused on fire mitigation strategies at the community level.

Mitigation Funding	Details	Notes
Sources Program		
Community Assistance	Focuses on mitigation/prevention, education, and outreach. National Fire Prevention and Education teams are sent to areas	See
and Protection	across the country at-risk for wildland fire to work with local residents.	website
Program	http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html	
Firewise Communities	Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property,	See
Program	and natural resources from the risk of wildland fire before a fire starts. http://www.firewise.org/	website

### **U.S. Department of Agriculture**

There are multiple mitigation funding and technical assistance opportunities available from the USDA and its various sub-agencies: the Farm Service Agency, Forest Service, and Natural Resources Conservation Service.

Mitigation Funding Sources Agency Program	Details	Notes
USDA Smith-Lever Special Needs Funding	Grants to State Extension Services at 1862 Land-Grant Institutions to support education-based approaches to addressing emergency preparedness and disasters. http://www.csrees.usda.gov/funding/rfas/smith_lever.html	Population under 20,000
USDA Community Facilities Guaranteed Loan Program	This program provides an incentive for commercial lending that will develop essential community facilities, such as fire stations, police stations, and other public buildings. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population under 20,000
USDA Community Facilities Direct Loans	Loans for essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Community Facilities Direct Grants	Grants to develop essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Farm Service Agency Disaster Assistance Programs	Emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland and livestock damaged by natural disasters. http://www.fsa.usda.gov/	Farmers and ranchers
USDA Forest Service National Fire Plan	Funding for organizing, training, and equipping fire districts through Volunteer, State and Rural Fire Assistance programs. Technical assistance for fire related mitigation. http://www.forestsandrangelands.gov/	See website
USDA Forest Service Economic Action Program	Funds for preparation of Fire Safe plans to reduce fire hazards and utilize byproducts of fuels management activities in a value-added fashion. http://www.fs.fed.us/spf/coop/programs/eap/	80% of total cost of project may be covered
USDA Natural Resources Conservation Service Emergency	Funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster. <u>http://www.nrcs.usda.gov/programs/ewp/</u>	See website

Mitigation Funding Sources Agency	Details	Notes
Program		
Watershed Protection Support		
Services		
USDA Natural Resources	Funds for soil conservation; flood prevention; conservation, development, utilization and	See website
Conservation Service Watershed	disposal of water; and conservation and proper utilization of land.	
Protection and Flood Prevention	http://www.nrcs.usda.gov/programs/watershed/index.html	

# Health and Economic Agencies

Alternative mitigation programs can be found through health and economic agencies that provide loans and grants aimed primarily at disaster relief.

Federal Loans and Grants for Disaster	Details	Notes
Relief Agency Program		
Department of Health & Human Services	Provide disaster relief funds to those SUAs and tribal organizations who are	Areas designated in a
Disaster Assistance for State Units on	currently receiving a grant under Title VI of the Older Americans Act.	Disaster Declaration issued
Aging (SUAs)	http://www.aoa.gov/doingbus/fundopp/fundopp.asp	by the President
Economic Development Administration	Grants that support public works, economic adjustment assistance, and planning.	The maximum investment
(EDA) Economic Development	Certain funds allocated for locations recently hit by major disasters.	rate shall not exceed 50
Administration Investment Programs	http://www.eda.gov/AboutEDA/Programs.xml	percent of the project cost
U.S. Small Business Administration	Low-interest, fixed rate loans to small businesses for the purpose of implementing	Must meet SBA approved
Small Business Administration Loan	mitigation measures. Also available for disaster damaged property.	credit rating
Program	http://www.sba.gov/services/financialassistance/index.html	

# **Research Agencies**

The United States Geological Survey (USGS) and the National Science Foundation (NSF) provide grant money for hazard mitigation-related research efforts.

Hazard Mitigation Research	Details	Notes
Grants Agency Program		
National Science Foundation (NSF)	Grants for small-scale, exploratory, high-risk research having a severe urgency with regard to	See website
Decision, Risk, and Management	natural or anthropogenic disasters and similar unanticipated events.	
Sciences Program (DRMS)	http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423&org=SES	
U.S. Geological Survey (USGS)	The purpose of NEHRP is to provide products for earthquake loss reduction to the public and	Community with a
National Earthquake Hazards	private sectors by carrying out research on earthquake occurrence and effects.	population under
Reduction Program	http://www.usgs.gov/contracts/nehrp/	20,000

Appendix C

**Meeting Documentation** 

## Hazard Mitigation Committee Town of New London

# WORK PLAN To update plan approved February 22, 2008

### Introduction Meeting - March 20, 2012

### Meeting #1: April 17, 2012 (2 hours)

- General discussion of requirements and in-kind match process
- Review goals of hazard mitigation plan and revise (hand out)
- Review hazards (see poster Add hazards? Remove hazards?)
- Identify and map past/potential hazards (update map & lists in Chapter 2)
- Flooding Are there any non-FEMA flood areas?
- Specific past and potential events of hazards not in 2006 plan (recent events)
- Potential development areas in town (compare with list in 2006 plan)
- Identify critical facilities (update map and list)
- Determine Vulnerability to Hazards for Town
- Determine Probability of Hazards for Town
- Review Critical Facilities & hazard vulnerability
- Discuss future meetings, public notice, stakeholders to be notified, notices to abutting towns

### Meeting #2 May 2, 2012 (2 hours)

- Review previously determined potential mitigation efforts (were they implemented? If not, why not and are they still on the table to be implemented?)
- Brainstorm improvements to existing mitigation efforts
- Brainstorm potential new mitigation efforts

### Meeting #3 June 19, 2012 (2 hours)

- Evaluate the past and potential mitigation efforts
- Develop a prioritized implementation schedule and discuss the adoption and monitoring of the plan

#### Meeting #4 August 13, 2012 (1 hour)

• Review and revise draft plan

# Appendix D

Map of Hazard Areas and Critical Facilities

# Appendix E

FEMA Approval and Town Resolution of Adoption

## Town of New London, New Hampshire Board of Selectmen A Resolution Approving the New London Hazard Mitigation Plan Update 2012

WHEREAS, the Town of New London received assistance from the Upper Valley Lake Sunapee Regional Planning Commission through funding from the NH Homeland Security and Emergency Management to prepare a hazard mitigation updated plan; and

WHEREAS, several planning meetings to develop the hazard mitigation plan update were held in  $\frac{446}{2012}$  and then presented to the Board of Selectmen for review and discussion on  $\frac{1}{2012}$ , 2012; and

WHEREAS, the New London Hazard Mitigation Plan contains several potential future projects to mitigate the hazard damage in the Town of New London; and

WHEREAS, the Board of Selectmen held a public meeting on  $\underline{0ct.29}$ , 2012 to formally approve and adopt the New London Hazard Mitigation Plan Update 2012.

NOW, THEREFORE BE IT RESOLVED that the New London Board of Selectmen approve the New London Hazard Mitigation Plan Update 2012.

APPROVED and SIGNED this  $2^{9}$  day of <u> $\mathcal{D}\mathcal{L}\Gamma$ </u>, 2012.

TOWN OF NEW LONDON BOARD OF SELECTMEN

Chair

(seal) ATTEST:

# Appendix F

**Mutual Aid Documentation**