Town of Springfield, New Hampshire Hazard Mitigation Plan

Town of Springfield Hazard Mitigation Committee

Snow Rolling Main Street (aka Howard Avenue) 1925

Upper Valley Lake Sunapee Regional Planning Commission

Plan submitted to FEMA May 2008
FEMA Approval August 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 man-made hazard events before they occur. The NH HSEM has provided funding to the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC), to prepare local Hazard Mitigation Plans with several of its communities. UVLSRPC began preparing a local Hazard Mitigation Plan for the Town of Springfield in October 2007. The *Springfield Hazard Mitigation Plan* serves as a strategic planning tool for use by the Town of Springfield in its efforts to reduce future losses from natural and/or man-made hazard events before they occur. This *Plan* does *not* constitute a section of the Master Plan.

The Springfield Hazard Mitigation Committee prepared the *Springfield Hazard Mitigation Plan* with the assistance and professional services of the UVLSRPC under contract with the NH HSEM operating under the guidance of the Federal Emergency Management Agency (FEMA). After a public hearing held in the Springfield Town Offices, the Springfield Board of Selectmen adopted the plan on June 24, 2008.

B. PURPOSE

The Springfield Hazard Mitigation Plan is a planning tool for use by the Town of Springfield in its efforts to reduce future losses from natural and/or man-made hazards. This plan does not constitute a section of the Town Master Plan, nor is it adopted as part of the Zoning Ordinance.

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 must review and if necessary, update the mitigation plan annually 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 *Springfield Hazard Mitigation Plan* includes the identification of natural hazards affecting the Town, as identified by the Springfield Hazard Mitigation Committee. The hazards were reviewed under the following categories as outlined in the State of New Hampshire Hazard Mitigation Plan:

I. Flooding (Including hurricanes, 100-year floodplain events, debris-impacted infrastructure, erosion, mudslides, rapid snow pack melt, river ice jams, dam breach and/or failure)
II. Wind (Including hurricanes, tornadoes, "Nor'easters," downbursts and lightning)
III. Fire (Including forest fires and issues such as isolated homes and residential areas)
IV. Ice & Snow Events (Including heavy snow storms, ice storms, and "Nor'easters,")
V. Earthquake (Including landslides and other geologic hazards related to seismic activity)
VI. Other Events (Including hazardous materials events and terrorism)

E. METHODOLOGY

Using the *Guide to Hazard Mitigation Planning for New Hampshire Communities* (2002), as developed by the Southwest Regional Planning Commission (SWRPC), the Springfield Hazard Mitigation Committee, in conjunction with the UVLSRPC, developed the

content of the *Springfield Hazard Mitigation Plan* by tailoring the nine-step process set forth in the guidebook appropriate for the Town of Springfield. Many FEMA resources and multiple State and Federal websites were also used as well as the Springfield Master Plan and Emergency Management Plan. The Committee held a total of three posted meetings beginning in October 2007 and ending in February 2008. All meetings were posted at the Town Office and post office inviting the general public. A notice was placed in the Valley News for the January 2008 meeting, and notices were sent to the Town Offices of neighboring towns to invite town officials. Town officials and local residents attended. For the publicly posted meeting agendas see Appendix D: Meeting Documentation. The public will continue to be involved in future revisions as meetings will be posted publicly and advertised in local newspapers. FEMA granted conditional approval on June 18, 2008. The Springfield Board of Selectmen adopted the Plan, contingent upon FEMA final approval, on 6/24/08. Prior to the Town of Springfield approving the Plan, a public hearing was held to gain additional input from the citizens of Springfield and to raise awareness of the ongoing hazard mitigation planning process.

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

October 4, 2007 (Meeting between UVLSRPC, Selectboard, & Hazard Mitigation Committee)
October 24, 2007 (Hazard Mitigation Committee)
December 5, 2007 (Meeting between Emergency Management Director & UVLSRPC)
January 8, 2008 (Meeting between Administrative Assistant & UVLSRPC)
January 24, 2008 (Hazard Mitigation Committee)
January 30, 2008 (Meetings with Road Agent and Administrative Assistant with UVLSRPC)
February 21, 2008 (Hazard Mitigation Committee to review draft plan)

To complete this Plan, the Hazard Mitigation Committee followed the following planning steps:

Step 1: Identify and Map the Hazards (October 2007)
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 (October 2007)
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 Springfield 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 (October 2007)
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 Protection/Mitigation (October 2007)
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.

Step 5: Determine Actions to be Taken (January 2008)
During an open brainstorming session, the Hazard Mitigation Committee developed a list of other possible hazard mitigation actions and strategies for the Town of Springfield. Ideas proposed included policies, planning, and public information. A list of potential mitigation strategies can be found in Chapter VII.

Step 6: Evaluate Feasible Options (January 2008)
The Hazard Mitigation Committee evaluated the proposed actions 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 (Ongoing)
UVLSRPC staff reviewed the Springfield 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 was involved in preparing the Emergency Operations Plan participated in the hazard mitigation meetings, to avoid duplication and to share information.

Step 8: Determine Priorities (January 2008)
The Committee reviewed the preliminary prioritization list in order to make changes and determine a final prioritization for new hazard mitigation actions and existing protection strategy improvements identified in previous steps. UVLSRPC also presented recommendations for the Committee to review and prioritize. These are provided in Chapter VIII.

Step 9: Develop Implementation Strategy (January 2008)
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 actions. 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* (2004), which served as a resource for the *Springfield Hazard Mitigation Plan*. The process for monitoring and updating the Plan can be found in Chapter IX.

F. HAZARD MITIGATION GOALS

The Town of Springfield Hazard Mitigation Committee reviewed the hazard mitigation goals for the State of New Hampshire, and revised them for Springfield.

They are as follows:

1. To protect the general population, the citizens of the town and guests, from all natural and man-made hazards.

2. To reduce the potential impact of natural and man-made disasters on the town's critical support services, critical facilities, and infrastructure.

3. To reduce the potential impact of natural and man-made disasters on the town's economy.

4. To reduce the potential impact of natural and man-made disasters on the town's natural environment.

5. To reduce the potential impact of natural and man-made disasters on the town's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the town.

6. To identify, introduce and implement cost effective hazard mitigation measures so as to accomplish the town's goals (above) and to raise the awareness and acceptance of hazard mitigation.

G. ACKNOWLEDGEMENTS

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

- Frank Anderson, *Town of Springfield Emergency Management Director*
- Bradley Butcher, *Town of Springfield Road Agent*
- Tom Duling, *Town of Springfield Health Officer*
- Tim Julian, *Town of Springfield Chief of Police*
- Janet Roberts, *Town of Springfield Administrative Assistant*
- John Chiarella, *Town of Springfield Selectman*
- Gene Hayes, *Town of Springfield ZBA*
- Robert Anderson, *Town of Springfield Chair Selectmen*
- Dallas Patten, *Town of Springfield Fire Department Chief*
- John Trachy, *Town of Springfield Conservation Commission*
- Ken Jacques, *Town of Springfield Planning Board & Twin Lake Villa Representative*
- Jeremy LaPlante, NH *Homeland Security & Emergency Management Field Representative*
- Courtney Daniell, *Upper Valley Lake Sunapee Regional Planning Commission*
- Victoria Davis, *Upper Valley Lake Sunapee Regional Planning Commission*

The Hazard Mitigation Committee was composed of local officials, representatives from state agencies (NH HSEM), citizens of Springfield 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 or through invitation. 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 D: 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

A. INTRODUCTION[1]

The Town of Springfield is located in Sullivan County, north of the Towns of New London and Sunapee off I-89 between Concord and Lebanon. The Town encompasses approximately 28,479 acres or 44.5 square miles in area including close to 1,000 acres of surface water. Springfield has one of the largest land areas in the Region. The Town can be generally characterized as high, hilly, wooded, and rural with several water bodies and large acreages of forest cover mixed with occasional individual homes and groups of houses along the road system. Approximately 29% of the Town is conserved land.

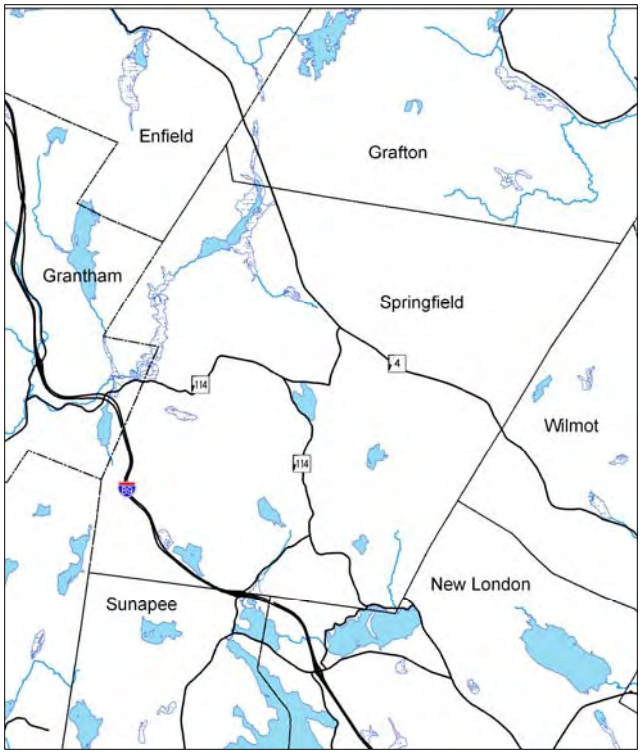
Most of Springfield is in the Sugar River Watershed. The northeastern portion of the Town is within the Blackwater River Watershed and the Smith River Watershed. A very small area in the northwestern portion of Town is within the Mascoma River Watershed. There are no rivers in Springfield. Major brooks are Gove, Bog, Carter, Sanders, Kidder, and Colcord Brooks. Several lakes and ponds are scattered throughout the town: Kolelemook Lake (98 acres, 1,387' el.), Baptist Pond (99 acres, 1,266' el.), Bog Brook Reservoir (94 acres, 990' el.), Star Lake (67 acres, 1,286' el.), Morgan Pond (34 acres, 1,682' el.), Dutchman Pond (28 acres, 1,543' el.), and, and several lesser ponds such as Little Stocker Pond (18 acres, 1,190' el.), Palazzi Pond (16 acres, 1,037' el.), McAlvin Pond (10 acres, 1,335' el.) and other unnamed ponds. There are also the McDaniels Waterfowl Marsh Wildlife Management Area around the Bog Brook Reservoir and a small portion of Little Sunapee Lake which is primarily located in New London.

High elevations and steep slopes have encouraged the preservation of forest tracts particularly in the eastern portion of town. Although there is little "virgin" timber in Town, older reforestation has left substantial stands in the area in and around Gile Memorial Forest and to the southwest between I-89 and New London Road. Approximately 85% of the town is covered with forests (1998 Orthophotos). Lumbering is a major industry in Springfield.

Town facilities include the Town Office Building which houses the town offices, the library, police department, and kindergarten. The fire station and highway garage are housed in the same building. The Town/Meeting Hall was moved to its current site in 1851. A church is located on its second floor. The Historical Society's collection is housed in a small building formerly a one-room schoolhouse. The old concrete highway garage building is used as storage for both the Highway and Cemetery Departments.

[1] Springfield Town Master Plan 2005 and Springfield Hazard Mitigation Committee

The Town of Springfield does not operate a public municipal water or sewer system for the entire town. However, the New London-Springfield Water System Precinct provides water to the Twin Lake Villa area in the southeast corner of Springfield which currently services 20-25 private seasonal and year-round homes in Springfield as well as a summer hotel and 15 rental houses. Some of the rental houses are winterized and rented out in the winter for skiing as well as in the warmer months. This water system extends into New London where the water system also serves five rental homes belonging to Twin Lake Villa as well as New London's commercial area including private residences, the New London Hospital, and Colby Sawyer College. The well field for the system is located on a peninsula in Springfield extending into Little Sunapee Lake. These wells feed the main pump station and a million gallon water tank located in Springfield and the auxiliary pump station and a one-half million gallon water tank located in New London. There is a back-up generator at each pump station. The Springfield water tank could supply two to three days worth of water for residential use.



The Village District of Eastman provides a water system serving approximately 1,300 units—most of the units are located in the Town of Grantham though several units are located in the Town of Springfield and some units are located in the Town of Enfield. The well field and treatment facility are located in Springfield.

The publicly maintained roads total about 68 miles. The Town maintains 37 of those miles. Several roads are part of the State system: Route 4A, Route 114, Georges Mills Road, and Four Corners Road.

Figure II-1: Locus Map of Springfield

Springfield is currently not a participating member of the National Flood Insurance Program. The Town of Springfield is currently working toward become a participating member of the NFIP. As part of the National Flood Insurance Program (NFIP), Flood Hazard Boundary Maps were prepared for the Town on November 8, 1977. Updated maps for all towns within Sullivan County were finalized in 2006. These maps identified those areas in town that fall within Zone A, which are Special Flood Hazard Areas inundated by the 100-year flood, with base flood elevations *not* determined. Examination of the floodplain maps indicates that there are relatively few areas that would be inundated by a 100-year flood. However, the Springfield Hazard Mitigation Committee identified several other areas which have been flooded. The Special Flood Hazard Areas and the Committee identified flood areas are shown in Appendix E.

B. DEVELOPMENT TRENDS

Examination of the U.S. Census Data indicates that population grew by 48% from 1980 to 1990 going from a population of 532 to 788. From 1990-2000, population increased by 20%. Using NH Office of Energy and Planning 2005 population estimate of 1,060 for the Town, population grew by approximately 12% between 2000 and 2005.

The predominant land use in Springfield is residential. Most of this development is in year-round single family homes although there are substantial seasonal homes. The greatest density of development occurs along Route 114 in the southern portion of town. The remaining development occurs along other road frontage in the western portion of town. The Eastman development is predominantly located in the neighboring Town of Grantham. However, this development spills over into a western section of Springfield with several lots (developed and undeveloped) on private roads. Two new developments are currently being proposed to the Town: a development of about 15 homes on the east side of Route 114 below Kolelemook Lake and a 20-30 home development between Town Farm Road, Four Corners Road, and Route 114. The Twin Lake Villa, Incorporated owns a 150 acre parcel behind its hotel which could potentially be developed in the future. If any of these potential developments are approved, they will be located in elevated areas away from flood hazards.

Several factors have played, and will continue to play, an important role in the development of Springfield. These include the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, soil conditions, wetlands, and aquifers; land set aside for conservation; and the effectiveness of the zoning ordinance to control growth in areas less desirable to development such as on steep slopes. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Most of the hillsides have steep slopes and shallow soils not suitable for development, but the current zoning ordinance does not address this issue and allows development in these areas. Due to growth pressures in the region, the recreational lakes in Springfield,

a nearby ski area, and Springfield's proximity to I-89, the Town is a desirable location for future development. Review and amendment of land use regulations will help the Town determine the density and location of future development taking into account many factors including steep slopes and known hazard event areas such as flood zones.

The following tables provide the current population and number of housing units in Springfield as well as projections. (According to the Springfield Master Plan, the NH Office of Energy & Planning population projections for the Town of Springfield may be low.) The average number of persons per occupied housing unit was 2.45 in 2000. In 2000, there were 148 vacant units—this includes 129 seasonal units, probably used for hunting and vacation. These were assumed to be included in the U.S. Census total housing units as single-family units. It is important to consider these vacant units in hazard mitigation as they are often located near water bodies. These units may also be occupied during certain seasons of the year prone to natural hazard, e.g. vacation home occupants may be impacted by a flooding and should be included in any educational campaign for disaster preparedness.

Table II-1: AREA POPULATION TRENDS

Area	1970	1980	Avg. Annual Growth 70-80	1990	Avg. Annual Growth 80-90	2000	Avg. Annual Growth 90-00	30 Yr. Avg. Annual Rate
Springfield	**310**	**532**	**5.55%**	**788**	**4.01%**	**945**	**1.83%**	**3.79%**
Croydon	396	457	1.44%	627	3.21%	661	0.53%	1.72%
Enfield	2345	3175	3.08%	3979	2.28%	4618	1.50%	2.28%
Grafton	370	739	7.16%	923	2.25%	1138	2.12%	3.82%
Grantham	366	704	6.76%	1,247	5.88%	2,167	5.68%	6.11%
New London	2236	2935	2.76%	3,180	0.80%	4,116	2.61%	2.05%
Sunapee	1,384	2,312	5.27%	2,559	1.02%	3,055	1.79%	2.67%
Wilmot	516	725	3.46%	935	2.58%	1144	2.04%	2.69%
Sullivan County	*30,949*	*36,063*	*1.54%*	*38,592*	*0.68%*	*40,458*	*0.47%*	*0.90%*
New Hampshire	*737,681*	*920,610*	*2.24%*	*1,109,252*	*1.88%*	*1,235,786*	*1.09%*	*1.73%*

Source: US Census

Table II-2: POPULATION PROJECTIONS FOR SPRINGFIELD

	1970	1980	1990	2000	2010	2020	2030
Population	310	532	788	945	1170	1320	1430
Decade Change in Population		73%	48%	20%	24%	13%	8%

Source: 1970 – 2000 US Census & 2010 – 2030 NH Office of Energy & Planning

Table II-3 : OCCUPIED HOUSING UNIT PROJECTIONS BY TYPE FOR SPRINGFIELD

	2000	2010	2020	2030
Single-Family Units (.85)	328	406	458	496
Multi-Family Units (.02)	8	10	11	12
Mobile Home Units (.13)	50	62	70	76
TOTAL OCCUPIED UNITS	*386*	*478*	*539*	*584*

Source: US Census PHC 2-31Table 18 for unit type proportions in 2000; assumed all vacant units are single-family; projected totals based on persons/occupied unit (2.45)

Table II-4: TOTAL HOUSING UNIT PROJECTIONS BY OCCUPANCY FOR SPRINGFIELD

	2000	2010	2020	2030
Seasonal or Vacation Vacant (.24)	129	158	176	191
Other Vacant Units (.04)	19	25	29	31
Occupied Units (.72)	386	478	539	584
TOTAL ALL UNITS	*534*	*661*	*744*	*806*

Source: US Census PHC-1-31 Table 12 for 2000; total units projected as percentage of occupied units; other units projected in proportion of total in 2000.

III. HAZARD IDENTIFICATION

The Springfield 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 Sullivan County in particular. A list of past hazard events in Springfield, Sullivan 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 SPRINGFIELD?

Springfield is prone to a variety of natural and human-made hazards. The hazards that Springfield 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 Springfield are dam failure, flooding, hurricane, tornado, thunderstorm (including lightening and hail), severe wind, extreme winter weather (including extreme cold and ice storms), snow avalanche, earthquake, landslide, erosion, drought, extreme heat, wildfire, natural water & air contaminants, and hazardous materials spills. 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 Springfield and are not anticipated to have an impact as determined by the Hazard Mitigation Planning Committee, representatives from state agencies and citizens of the Town of Springfield. Eliminated hazards include Land Subsidence, Expansive Soils, and Snow Avalanches due to soils and topography not conducive to these hazards as well as relative location of existing and proposed development.

B. DESCRIPTIONS OF HAZARDS

An assessment of each hazard relevant to Springfield 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. The "risk" designation for each hazard was determined after evaluations discussed later in this chapter.

- Dam Failure
- Flooding
- Hurricane
- Tornado & Downburst
- Thunderstorm/Lightening/Hail
- Severe Winter Weather
- Earthquake
- Landslide
- Drought
- Extreme Heat
- Erosion
- Wildfire
- Natural Air & Water Contaminants
- Hazardous Materials Spill

Dam Failure

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. Appendices G and H provide maps with the location of dams in Springfield.

Past Dam Failure Events

There have been no dam failures in Springfield or any surrounding towns which impacted Springfield. Three dams were designated by the State as "low hazard potential" which means because of its location and size, a dam failure would result in no possible loss of life, low economic loss to structures or property; possible structural damage to public roads; the release of liquid industrial, agricultural, or commercial wastes under certain conditions; and reversible losses to environmentally-sensitive areas. Three dams were designated as "non-menace" which means because of its location and size, a dam failure would not result in probable loss of life or loss to property.

Table III-1: DAMS – LOW RISK

DAMS (DAM FAILURE – LOW RISK)									
Dam #	**Class**	**Dam Name**	**Water Body**	**Owner**	**Status**	**Type**	**Impoundment Area in Acres**	**Height of Dam (Ft)**	**Drainage Area in Acres**
220.01		Branch Bog Brook	Branch Bog Brook	Hollis Heath	Active	S/Earth	6.0	12	4.69
220.02	NM	Branch Bog Brook	Branch Bog Brook	Hollis Heath	Breached	S/Earth	0	4	3.75
220.03		Carter Brook	Morgan Brook	Unknown	Ruins	S/Earth	0	8	0
220.04		Lake Kolelemook	Lake Kolelemook	Town	Active	Concrete	99	4.5	1.26
220.05	NM	Gove Brook	Gove Brook	Town	Active	S/Earth	1.3	6	1.19
220.06	NM	Gove Brook	Gove Brook	David Reney	Breached	Earth	0	8	1.38
220.07		Gove Brook	Gove Brook	David Reney	Ruins	Earth	3.5	7	0
220.08		Morgan Pond Brook	Morgan Pond Brook	New London	Ruins	S/Earth	0	10	2.3

DAMS (DAM FAILURE – LOW RISK)									
220.09	L	Morgan Pond Dam	Kidder Brook	NL/S Water Dist	Active	Concrete	34	12	.87
220.10	NM	Morgan Pond Brook	Morgan Pond Brook	NL/S Water Dist.	Active	Concrete	0.25	16	0
220.11	L	Star Lake Dam	Otter Brook	Star Lk Properties	Active	Concrete	65.7	6.5	1.6
220.12	L	Washburn Cor/Bog Br	Bog Brook	NH F&G	Active	E/C	202	135	12.1
220.13	NM	Fire Pond Dam	Unnamed Stream	Donald Hayes	Active	Earth	.2	6	0
220.14	NM	Wildlife Pond Dam	Unnamed Stream	Kirk Heath	Active	Earth	.33	10.5	0
220.15	NM	Wildlife Pond Dam	Unnamed Stream	Charles Lawson	Active	Earth	.16	6	0
220.16	L	Bog Brook Pond Dam	Bog Brook	Bog Br Pd Assoc	Active	Concrete	17	18	.89
220.17	NM	Fire Pond Dam	Unnamed Stream	Arnold Putney	Active	Earth	.06	13	0
220.18	NM	Kidder Brook Dam	Kidder Brook	NL/S Water Dist.	Active	Concrete	1	19	2.1
220.19	NM	Bernhardy Dam	Gove Brook	Charles Gallup	Active	Earth	2	5	0

Source: Dam information provided by the NH Dam Bureau in 2007; 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 Type: S=stone; C=concrete; E=earth

Potential Future Dam Failure Damage

Although there are 19 dams in Springfield, there are no "high" or "significant" hazard dams in Springfield. No emergency action plans are required for any of these dams to delineate inundation areas. The neighboring Town of Grantham has a dam at the southern end of Eastman Pond ranked as "high hazard potential." Appendix G is a map of the inundation area of the Eastman Dam from the Emergency Action Plan. This shows if the dam were to fail, a very small, undeveloped portion of Springfield would be impacted.

Although the remainder of Springfield's dams are not considered "high" or "significant" hazards, the Committee is concerned about the Morgan Pond Dam and the Star Lake Dam which are rated as "low" hazard. If the Morgan Pond Dam were to fail, it would travel primarily through the Gile State Forest. However, waters from the failed dam could exit the forest along the Kidder Brook to where there is substantial development on the Twin Lake Villa Road, Golf Course Road, and Route 114 to Little Sunapee Lake in the Town of New London. If the Star Lake Dam were to fail, the waters could travel downstream along Georges Mill Road to a low lying area including the Springfield Power Plan at I-89 and the town line toward Otter Pond in the Town of Sunapee. Since the perceived potential impact could be great, the Committee chose to include mention of these dams.

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 Springfield 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.

100-Year Floods 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. Appendix E displays the "Special Flood Hazards Areas."

River Ice Jams 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. A search on the Cold Regions Research and Environmental Laboratory (CRREL) and discussion with the Springfield Committee revealed that there is no history of ice jam related events in the Town.

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

Severe Storms 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.

Bank Erosion and Failure 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. Roads and bridges are also susceptible to erosion.

Past Flooding Events

In the spring of 2007 several roads which are not designated areas of 100-year flood were washed out. The Committee delineated all areas where flooding has occurred in recent years. Appendix E is a map which shows the locally identified flood areas and the flood Insurance Rate Map of Special Flood Hazard Areas determined by FEMA to be potential hazard zones in a 100-year flood. The following tables provide a list of floods in the State, County, and Springfield.

Table III-2: FLOODING – FEMA DISASTER DECLARATIONS

FLOODING – FEMA DISASTER DECLARATIONS				
Hazard	**Date**	**Location**	**Description of Areas Impacted**	**Damages**
Flood	March 11-21, 1936	NH State	Damage to Road Network. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather. Run-off from melting snow with rain overflowed the rivers	Unknown
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. Flooding caused by a series of storm events with moderate to heavy rains.	$2,297,777 in damage.
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties, NH	FEMA Disaster Declaration # 1144- DR. Flooding caused by heavy rains.	$2,341,273 in damage.
Flood	October 7-18, 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding.	$30,000,000 in damages.
Flood	April 16, 2007	All counties, NH	FEMA Disaster Declaration # 1695. Severe storms and flooding.	$27,000,000 in damages; 2,005 home owners and renters applied for assistance in NH.

Table III-3: FEMA FLOOD INSURANCE RATE MAP SPECIAL FLOOD HAZARD AREAS

Location	Description of Area	Comments
Stoney Brook Road	Four houses	See Locally Defined Flooding table
Colcord and Bog Brooks/Eastman Development/Eastman Access Rd	Three houses, one mobile home, and potential for new homes in Eastman development w/private rds	Eastman Access Road has had water to edge of road; no known flooding in area
McDaniels Marsh Wildlife Management Area	No structures	Conserved area with no development
Town Farm Road/Route 4A/Old Grafton Road	11 houses and seven mobile homes	See Locally Defined Flooding table
Wetland in NE corner of town	No structures	Area with no road access

Table III-4: LOCALLY DEFINED FLOODING – MEDIUM RISK

LOCALLY DEFINED FLOODING – MEDIUM RISK			
Date	**Location**	**Description of Areas Impacted**	**Damages**
Occasional depending on dam control and weather	Golf Course Road & State Route 114	Flooding; needs a box culvert on Golf Course Road	Road only
Springs of 2006 & 2007	Messer Hill Road	Flooding; Will replace a couple culverts	Road only
	Oak Hill Road West	Washed; Working on deepening ditches	
	Cemetery Road	Some road wash; replaced a culvert	
	George's Mill Road (State road) just south of Route 114	Shoulders and part of pavement washed; took out some private driveways; ditches & culvert filled w/debris	
Spring 2007	Striker & Fisher Corner Roads at intersection	Flooded road; State removed debris from culverts on Georges Mill Road—rectified problem	Town road wash total cost around $120,000; no damage to homes In the early spring of 2007, there were two wet snow storms followed by rain. Water coming down the hillsides and snow and ice in the culverts and ditches caused an unusual amount of water in the roads which caused substantial damage.
	Eastman Access Road	Water up to edge of road; minor shoulder wash	
	Stoney Brook Road (Special Flood Hazard Area)	Road flooding; only floods after major storm event	
	Route 4A (State road) west of Sugar House Road	Washed shoulder on Sugar House Road and some pavement loss on Rt. 4A; only an issue in severe weather though Rt. 4A impacted by lack debris removal from culvert/ditch	
	Town Farm Road just south of Howard Road	Big swamp nearby; water from Gile Forest; culvert has filled; lost ½ road width; ditch washed out and culvert couldn't handle water; replaced two culverts on Town Farm Road	
	Phillbrook Hill Road just south of George Hill Rd	Portion of road wash out	
	Deer Hill Road	Portion of road wash out	
	Nichols Hill Road	Road wash out	
	Town Farm Road/Route 4A/Old Grafton Road (Special Flood Hazard Area)	Minor shoulder wash; could back up due to nearby beaver activity	
	Deep Snow Drive	Subject to heavy run-off due to lay of land	
	Hazzard Road North	Portion of road washed out; rebuilt road w/ new culverts in 2007	
	George Hill Road	Road shoulder washed out; heavy run-off due to nearby logging and tree damage by wind	
	Lorent Drive	Some road wash; private pond overflow	

Potential Future Flooding Events

Future flooding is likely as noted in the above table based upon local knowledge of past flood events. The total structures in potential flood areas which are low and vulnerable to flooding include 19 houses and eight mobile homes although flooding has not damaged any of these homes as yet. Two homes are located in the Eastman development on private roads. These houses appear to be located in a FIRM special flood hazard area and are included in the FEMA list. However, they are not listed in the locally defined flooding table as the Town is not aware of flooding in this area as the Town is not responsible for maintaining the roads in Eastman. According to the State's Mitigation Plan, Sullivan County has a high hazard risk for flooding. The Committee determined flooding is a medium risk in Springfield.

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 Hazard Mitigation Plan*; FEMA website).

Past Hurricane Events

There have been several hurricanes over the years which have impacted New England and New Hampshire. These are listed below. The 1938 hurricane directly impacted Springfield according to the Committee member recollections.

Table III-5: HURRICANES & TROPICAL STORMS – LOW/MEDIUM RISK

HURRICANES AND TROPICAL STORMS – LOW/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
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

HURRICANES AND TROPICAL STORMS – LOW/MEDIUM RISK				
Hazard	**Date**	**Location**	**Description of Areas Impacted**	**Damages**
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
Hurricane (Bob)	August 19, 1991	Southern New England; caused flooding in Springfield	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	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

Potential Future Hurricane Damage

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, Sullivan County has a medium risk for hurricanes. The Committee determined the hurricane risk to be low/medium in Springfield.

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 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 Sullivan County between 1950 and 1995 as provided by the "Tornado Project" (www.tornadoproject.com) and the *NH Natural Hazard Mitigation Plan*. In 2007, a severe microburst knocked down stands of trees and damaged a house and car in Springfield.

Table III-6: TORNADOES IN SULLIVAN COUNTY – LOW RISK

TORNADOS – LOW RISK Sullivan County		
Date	**Fujita Scale**	**Damages**
October 24, 1955	F0	No deaths or injuries; costs unknown
July 9, 1962	F0	No deaths or injuries; costs unknown
July 9, 1962	F1	No deaths or injuries; costs unknown
July 18, 1963	F1	No deaths or injuries; costs unknown

Potential Future Tornado Damage

It is impossible to predict where a tornado or downburst will occur or what damage it will inflict. The Springfield Committee does not recall tornadoes in Springfield. The FEMA website places the State of NH in the Zone II 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, Sullivan County has a medium risk for tornadoes. The Committee determined there is a low risk for tornadoes and downbursts in Springfield.

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), 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 lightening will strike. There have probably been lightening strikes in Springfield, but there is no record of damage.

Past Thunderstorm Events

There have probably been lightening strikes in Springfield, but there is no record of damage. A thunderstorm with lightening or hail could impact the entire town. There have been no recalled serious hailstorms or lightening strikes in Springfield.

Potential Future Thunderstorm Damage

It is inevitable that thunderstorms will occur in Springfield's future. Lightening, 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, Sullivan County has a medium risk of a lightening hazard. The risk for future thunderstorm damage was determined by the Committee to be low/medium risk in Springfield.

Severe Winter Weather

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

Heavy Snow Storms A heavy snowstorm is generally considered to be one which deposits four or more inches of snow in a twelve-hour 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."

Ice Storms 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 O 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.

"Nor'easters" 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

The following table provides a list of past extreme winter weather events in New Hampshire and Springfield.

Table III-7: SEVERE WINTER WEATHER – LOW/MEDIUM RISK

SEVERE WINTER WEATHER/ICE STORMS – MEDIUM 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
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	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 central NH	Unknown
Snow Storm	February, 1979	New Hampshire	President's Day storm	Unknown
Ice Storm	January 8-25, 1979	New Hampshire	Major disruptions to power and transportation	Unknown

SEVERE WINTER WEATHER/ICE STORMS – MEDIUM RISK				
Hazard	**Date**	**Location**	**Description of Areas Impacted**	**Damages**
Snow Storm	April 5-7, 1982	New Hampshire	Up to 18 inches of snow in southern NH	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 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	1997	New Hampshire	Power outages throughout Springfield due to heavy snowfall	Unknown
Ice Storm	January 15, 1998	New Hampshire; Substantial power outages in Springfield for a week	Federal disaster declaration DR-1199-NH, 20 major road closures, 67,586 without electricity, 2,310 without phone service, $17+ million in damages to Public Service of NH alone	Unknown
Snow Storm	2000	Regional; entire town of Springfield	Heavy snow	Unknown
Ice Storm	2004	Regional	Ice storm resulted in many trees down and loss of power.	Unknown
Ice Storm	2007	Springfield, Regional	Ice storm resulted in many trees down and loss of power.	One house and car damaged. Much tree damage

Potential Future Severe Winter 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, Sullivan County has a high risk for severe winter weather. The Committee determined severe winter weather to be a medium risk in Springfield.

Earthquake

The following is a list of earthquakes which have impacted New England, New Hampshire, and Springfield.

Table III-8: EARTHQUAKES – LOW/MEDIUM RISK

EARTHQUAKES – LOW/MEDIUM RISK			
Date	**Location**	**Magnitude**	**Damage**
1638	Central NH	6.5-7	
October 29, 1727	Off NH/MA coast	NA	Widespread damage Massachusetts to Maine: cost unknown
December 29, 1727	Off NH/MA coast	NA	Widespread damage Massachusetts to Maine: cost unknown
November 18, 1755	Cape Ann, MA	6.0	Much damage: cost unknown
1800s	Statewide	83	Unknown
1900s	Statewide	200	Unknown
March 18, 1926	Manchester, NH	Felt in Hillsborough Co	Unknown
Dec 20, 1940	Ossipee, NH	Both earthquakes 5.5	Damage to homes, water main rupture: cost unknown.
December 24, 1940	Ossipee, NH	NA	Unknown
December 28, 1947	Dover-Foxcroft, ME	4.5	Unknown
June 10, 1951	Kingston, RI	4.6	Unknown
April 26, 1957	Portland, ME	4.7	Unknown
April 10, 1962	Middlebury, VT	4.2	Unknown
June 15, 1973	Near Quebec Border	4.8	Unknown
January 19, 1982	West of Laconia	4.5	Structure damage 15 miles away in Concord: cost unknown
October 20, 1988	Near Berlin, NH	4	Unknown
April 2002	Entire town	n/a	Fault under Mount Kearsarge; No known damage

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 Springfield. 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. According to the State's mitigation plan, Grafton County has a medium risk for earthquakes. The Committee determined the risk to be low/medium in Springfield.

Landslide

A landslide is the downward or outward movement of slope-forming materials reacting under the force of gravity, including mudslides, debris flows, and rockslides. Formations of sedimentary deposits along the Connecticut River also create potential landslide conditions. Landslides can damage or destroy roads, railroads, electrical and phone lines, and other structures.

Past Landslide Events:

There have been no known landslides in Springfield.

Potential Future Landslide Events:

The best predictor of future landslides is past landslides. If any landslide events were to occur, they would be most likely in areas of very steep slope. There is little development in these areas, so no future structural damage cost due to this natural hazard is anticipated although there could be road or utility pole damage. The Committee delineated an area where a landslide could potentially occur along Route 114 next to Kolelemook Lake which includes four cottages. Another potential landslide area is at the State rest area along I-89, but this is a State concern. Another potential area is off Nichols Hill Road which would not involve any structures though utility poles could be impacted. The Committee determined there is a low risk for landslide damage.

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

Springfield has not experienced a drought to the Committee's knowledge.

Table III-9: DROUGHT – LOW 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	Affected residential wells and agricultural water sources	Unknown

Potential Future Drought Damage

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. According to the State's mitigation plan, Sullivan County has a medium risk for drought.

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 following table lists the extreme heat events in the past which included the Northeast and New Hampshire.

Table III-10: EXTREME HEAT – LOW/MEDIUM RISK

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
Late July, 1999	Northeast	13+ days of 90+ degree heat	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

Potential Future Extreme Heat Events

Extreme heat would impact the entire town 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 Springfield.

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 development and building

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

A housing development on Oak Hill has caused substantial erosion in the area due to housing constructed on steep slopes. This has impacted the adjacent roads in the area by making them more susceptible to erosion and wash out. Run-off from steep slopes with little vegetation moves more quickly and can cause more damage.

Potential Future Erosion Events

Since the zoning ordinance does not restrict development in steep slopes, it is anticipated that similar situations could arise in other areas of the town unless the ordinance is amended to prevent this type of development.

Wildfire

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

Springfield experienced a wildfire in 2005 in the Gile State Forest. Only five acres was burned due to the containment by the firefighters. The Town budgets $500 annually for forest fire fighting.

Potential Future Wildfire Events

There are many large, contiguous forest tracts in Springfield. Where development interfaces with the forested areas is called the "urban interface." These are the areas where structures could be impacted by a wildfire. Appendix F provides a map which displays the areas where housing and forest interface or are intermixed. The Committee considers all structures within Springfield to be in an urban interface, and wildfire could affect the entire town in structural and timber loss. According to the State's mitigation plan, Sullivan County has substantial debris to fuel a wildfire remaining from the ice storm of 1998 and heavy forest cover. The plan gives the county a high risk of wildfire. The Committee determined that the risk of wildfire in Springfield is low/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 http://www.des.state.nh.us/dwg.htm.

Past Natural Water & Air Contaminant Events

There have been no known events related to natural water and air contamination in Springfield although uranium is a known water contaminant in neighboring towns. Concentrated amounts of uranium were also found during the construction of I-89.

Table III-11: RADON – LOW RISK

RADON - LOW RISK					
Summary Table of Short-term Indoor Radon Test Results in NH's Radon Database 11/04/2003)					
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**

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 Springfield, 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, Sullivan County radon levels are below average for the State. According to the State's mitigation plan, Sullivan 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 low.

Hazardous Materials Spills

Hazardous materials spills or releases can cause loss of life and damage to property. Short or long-term evacuation of local residents and businesses may be required, depending on the nature and extent of the incident.

Past Hazardous Waste Spill Events

No known significant spills have occurred in Springfield though they are possible in transportation as there is substantial through traffic on Routes 4A and 114. In addition, heating fuel is delivered to homes on many of the town's roads. Below is a list of active hazardous waste generators where potential on-site spills could occur.

Table III-12: HAZARDOUS WASTE GENERATORS – LOW RISK

HAZARDOUS WASTE GENERATORS & ABOVE-GROUND STORAGE TANKS (Active) - Low Risk (Spills)			
Name	**Location**	**Hazardous Waste**	**Above-Ground Storage Tanks**
Auto Advisors, Inc.	Springfield Road	Small Quantity Generator	None
Durgin & Crowell Lumber	231 Fisher Corner Road	Small Quantity Generator	None (3 underground for diesel)
GH Evarts & Co.	2377 Route 4A	NA	300 gallon gas; 300 gallon diesel; 10,000 gallon #2 heating fuel
Springfield Power	54 Fisher Corner Road	Small Quantity Generator	3-300 gallon steel: diesel & kerosene; 200 gallon steel: diesel; 1,000 gallon: transformer oil filled electrical equip.
Source: NH Department of Environmental Services One-Stop Website			

Potential Future Hazardous Waste Spill Damage

There conceivably could be spills near any home in Springfield due to home heating fuel delivery. The property owner is responsible for clean-up. The State oversees these reported spills. Larger spills are possible from non-residential tanks and hazardous waste generation as shown above. There are also other small businesses which are anticipated to generate some hazardous waste products.

There is a potential for hazardous materials spills on all roads, especially the highly traveled NH Routes 4A and 114. The cost for clean-up would be assigned to the transporter. However, there should be an emergency plan to immediately respond to the site to minimize water, air, and ground contamination. The State did not determine county risk for hazardous waste spills in the *NH Hazard Mitigation Plan*. The Committee determined a hazardous waste spill is a low risk.

C. HAZARD RISK RATINGS

The Town of Springfield 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, Sullivan County, and the Town of Springfield**.** Flooding was ranked as the highest risk in Springfield with a risk rating of "medium."

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." Finally, the Committee determined probability and the State determined probability were averaged for the final probability ranking. These figures are shown in Table III-11 and III-12.

Table III-13: PROBABILITY OF HAZARD

Probability of Hazard Occurring in Sullivan County from State Plan											
Flood	**Dam Failure**	**Drought**	**Wildfire**	**Earth-quake**	**Land-slide**	**Radon**	**Tornado**	**Hurricane**	**Lightning**	**Severe Winter**	**Avalanche**
H	L	M	H	M	M	M	M	M	M	H	L

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. The Committee determined vulnerabilities were then averaged with the "low" vulnerability determined for Sullivan County in the *NH Natural Hazard Mitigation Plan*.

Table III-14: VULNERABILITY OF EXISTING DEVELOPED AREAS

Committee Assessment of Vulnerability	Human Impact	Property Impact	Economic Impact	Vulnerability
	Probability of death or injury	Physical losses and damages	Cottage businesses & agriculture	Avg. of human/ property/ business impact
Dam Failure	2	2	2	2.00
Flooding	1	3	2	2.00
Hurricane	1	2	2	1.67
Tornado & Downburst	1	1	1	1.00
Thunderstorm/Lightening/Hail	1	2	2	1.67
Severe Winter/Ice Storms	1	3	2	2.00
Earthquake	1	1	1	1.00
Landslide	1	1	1	1.00
Drought	1	1	1	1.00
Extreme Heat	1	1	1	1.00
Erosion	1	2	2	1.67
Wildfire	1	1	1	1.00
Natural Air & Water Contaminants	1	0	0	0.33
HazMat Spills	1	1	1	1.00

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**:** (1) 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: 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**:** 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.

Table III-15: RISK ASSESSMENT

Risk Assessment 0-1.9 Low 2-3.9 Low/Med 4-5.9 Med 6-7.9 Med-High 8-9 High								
Hazards	**Probability based on Committee Review**	**Probability based on State Hazard Plan**	**Average of Probabilities**	**Vulnerability based on Committee Review**	**Vulnerability based on State Hazard Plan**	**Average of Vulnera-abilities**	**Risk Rating (Probability x Vulnerability)**	**Risk**
Dam Failure	1	1	1	2.00	1	1.5	1.5	Low
Flooding	3	3	3	2.00	1	1.5	4.5	Medium
Hurricane	3	2	2.5	1.67	1	1.3	3.3	Low/Medium
Tornado & Downburst	2	2	2	1.00	1	1	2	Low/Medium
Thunderstorm/Lightening/Hail	3	2	2.5	1.67	1	1.3	3.3	Low/Medium
Severe Winter	3	3	3	2.00	1	1.5	4.5	Medium
Earthquake	2	2	2	1.00	1	1	2	Low/Medium
Landslide	1	2	1.5	1.00	1	1	1.5	Low
Drought	1	2	1.5	1.00	1	1	1.5	Low
Extreme Heat	3	n/a	3	1.00	1	1	3	Low/Medium
Erosion	3	n/a	3	1.67	1	1.3	3.9	Low/Medium
Wildfire	2	3	2.5	1.00	1	1	2.5	Low/Medium
Natural Contaminants	1	2*	1.5	0.33	1	.67	1	Low
HazMat	1	n/a	1	1.00	1	1	1	Low

**State risk score for radon only.*

IV. CRITICAL FACILITIES/LOCATIONS

The Critical Facilities list, identified by the Springfield 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 Springfield. The third category contains facilities/populations that the Committee wishes to protect in the event of a disaster. Values were obtained from town tax records using the "building market cost new" figures for main structures plus assessed value for accessory structures for 2005.

The Springfield Fire, Highway and Safety Building would be used for the Emergency Operations Center (EOC). This building and the Town Hall might be used as temporary shelter, though the primary shelter is located in the Town of Sunapee.

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

Critical Facility	Hazard Vulnerability	Value
Springfield Fire, Hwy & Safety Building (EOC/Temporary Shelter)	Winter storms; wind; earthquake; flood	$339,084
Memorial Building (Police, Town Offices, Library, & Kindergarten)	Winter storms; wind; earthquake; flood	$382,221
Town Hall (Alternate Temporary Shelter)	Winter storms; wind; earthquake; flood	$455,714
Deer Hill Communications Tower	Winter storms; wind; earthquake; flood	$372,100
Routes 4A and 114 and bridges for Evacuation & Emergency Access	Winter storms; earthquake; flood	Unknown

Table IV-2: NON-EMERGENCY RESPONSE FACILITIES & STRUCTURES

Critical Facility	Hazard Vulnerability	Value
Roads	Winter storms; earthquake; flood	Unknown
Oak Hill Cell Tower	Winter storms; wind; earthquake; flood	$503,700
New London-Springfield Water Precinct	Earthquake; flood	Unknown
Village District of Eastman Water System	Earthquake; flood	Unknown
Public Utilities	Winter storms; earthquake; flood	$8,838,900
Garage at Town Hall	Winter storms; wind; earthquake; flood	$18,000

Table IV-3: FACILITIES & POPULATIONS TO PROTECT

Critical Facility	Hazard Vulnerability	Value
Historical Society Building	Winter storms; earthquake; flood	$105,395
All homes and commercial buildings	Winter storms; earthquake; flood	$117,597,700

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 is neither large land areas slated for potential development nor large development projects in the works, so vulnerability of undeveloped land was not analyzed.

Table V-1: VULNERABILITY OF EXISTING DEVELOPED AREAS

Hazard	Area	Critical Facilities	Buildings	Infrastructure	Natural Resources	Total Known Building Value
Dam Failure (see map)	Very small area	None	None	None	NA	$0
Flooding (see maps)	Eastman	None	2 houses	road	NA	$349,580
	Eastman Access Road	None	1 house; 1 mobile home	road	NA	$20,756 for house; $46,919 for mobile home
	Philbrook Hill Road	None	1 house	road	NA	$65,599
	Deer Hill Road	None	1 house	road	NA	$519,536
	Nichols Hill Road	None	1 house	road	NA	$192,436
	Stoney Brook Road	None	4 houses	road	NA	$645,583
	Old Grafton/Deep Snow/Town Farm Roads	None	11 houses; 7 mobile homes	roads	Wetland systems	$1,901,342 for houses; $251,424 for mobile homes
	Golf Course Road	New London-Springfield Water	2 houses	roads	NA	$540,685

Hazard	Area	Critical Facilities	Buildings	Infrastructure	Natural Resources	Total Known Building Value
Hurricane	Town-wide	All	All	All	All	$15,000,000
Tornado & Downburst	Town-wide	All	All	All	All	Unknown
Thunderstorm/Lightening/ Hail	Town-wide	All	All	All	All	Unknown
Severe Winter/Ice Storms	Town-wide	All	All	All	All	Unknown
Earthquake	Town-wide	All	All	All	All	$15,000,000
Landslide	Kolelemook Lake	None	Four cottages	Roads	Wildlife habitat; vegetation; lake edge	$600,000
Drought	Town-wide	NA	All	Individual wells	Wildlife habitat; vegetation; forest; crops	Unknown
Extreme Heat	Town-wide	NA	NA	NA	Wildlife habitat; vegetation; forest; crops	Unknown
Erosion	Oak Hill Area	None	NA	Roads	Wildlife habitat; vegetation; forest	None
Wildfire	Forest/Urban Interface	All	All	All	Wildlife habitat; vegetation; forest; crops	Unknown
Natural Contaminants	Site Specific	NA	NA	NA	NA	Unknown
HazMat Spills	Site Specific	NA	NA	NA	NA	Unknown

B. IDENTIFYING VULNERABLE SPECIAL POPULATIONS

There are no centers of special populations in Springfield such as elderly housing or schools. The elderly and physically or mentally impaired residents are 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. Most of Springfield's population is located along the maintained roads throughout town.

C. POTENTIAL LOSS ESTIMATES

This section identifies areas in 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 Risk - $0 Estimated Cost
The Eastman Dam is classified as a "high hazard potential" dam in the neighboring Town of Eastman. A very small corner of Springfield has been mapped in the inundation area of this dam in the event of a dam failure. There are no homes in this area. Other dams in Springfield classified as "low hazard potential" or "non-menace" or "ruins" and no formal inundation maps have been developed for these dams.

Flooding – Medium Risk - $1,538,700 Estimated Cost
There are approximately 31 residential structures and no commercial structures in Springfield that are located within the FEMA designated Special Flood Hazard Areas and Committee determined flood areas. This is a conservative estimate as it is assuming a very unusually devastating flood since some of these homes are elevated a few feet above low spots within the designated flood areas. The total value of these structures is $4,533,860: $4,235,517 for the houses and $298,343 for the mobile homes. If it is estimated that a flood would cause 28 % structural damage to the houses and 78% structural damage to the mobile homes, the damage would total an estimated $1,418,700. There are no critical facilities within the determined flood areas. Several roads are impacted by these flood prone areas. In 2007, the cost for town road damage due to flooding was about $120,000.

Hurricane – Low/Medium Risk – No Recorded or Estimated Cost
Damage caused by hurricanes can be severe and expensive. Springfield has been impacted in the past by both wind and flooding damage as a result of hurricanes. The total assessed value of all structures within Springfield is approximately $15,000,000. 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 – Low/Medium Risk – No Recorded or Estimated Cost
Tornadoes, downbursts, and microbursts are relatively uncommon natural hazards in New Hampshire, although microbursts in 2007 caused substantial damage. 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/Lightening/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.

Severe Winter Weather – Medium Risk – No Recorded or Estimated Cost
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 (http://www.meteo.mcgill.ca/extreme/Research_Paper_No_1.pdf). 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 - $1,500,000 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 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. If all buildings in Springfield were impacted by an earthquake, the estimated damage could be around $1.5 million.

Landslide – Low Risk – No Recorded or Estimated Cost
In the past, landslide events have not caused damage to structures in Springfield, so there can be no damage estimate for this type of event. However, there are four cottages in the area of a potential landslide along Route 114. The approximate value of the cottages is $600,000. It is unknown what the cost of any road damage or lake edge might be.

Drought - Low 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 Springfield.

Extreme Heat – Low 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). The costs for this hazard are in terms of human suffering. It is not anticipated that there would be any structural or infrastructure costs.

Erosion – Low/Medium Risk – No Recorded or Estimated Cost
A housing development on Oak Hill has caused substantial erosion in the area due to housing constructed on steep slopes. This has impacted the adjacent roads in the area by making them more susceptible to erosion and wash out. Construction itself can cause erosion if best management practices are not used to control run-off from disturbed soils, and the rooftops of buildings displace water which would have gone into the ground. This is then exacerbated by the steep slopes where the run-off moves more quickly and can cause more damage. There is not an estimated cost for the wash-out of roads that could be directly attributed to this erosion, but it is anticipated that at least a portion of the cost is due to erosion. Since the zoning ordinance does not restrict development in steep slopes, it is anticipated that similar situations could arise in the town.

Wildfire – Low/Medium Risk – No Recorded or Estimated Cost
The risk of fire is difficult to predict based on location. 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. About 85% of the town is in primarily forested. Since the entire developed area of Springfield interfaces

with forest, all structures are potentially vulnerable to wildfire. The estimated value of these structures is approximately $18,500,000 for taxable structures and $300,000 for non-taxable structures.

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). (The Sullivan County Forester was not available at the time of writing this plan.)

Natural Water & Air Contaminants - Low Risk – No Recorded or Estimated Cost

The cost of a natural contamination hazard would be the health of individuals exposed to the material. No cost estimate is provided for this hazard. Inexpensive radon test kits are available at hardware stores to test air quality. Individuals could also test their water which could cost from $30 - $300 depending on what contaminants they include in the test. Installing appropriate water purifiers could alleviate the risk of most contaminants with the exception of radon which would require an expensive aeration treatment system (estimated cost of $2,500), if it were present.

Hazardous Material Spills - Low 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 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 Springfield. There are “small quantity generators” including the Springfield Power Plant which burns pulp wood chips to sell power. Any spills would probably be a result of accidents from these small quantity generators, heating fuel delivery, or transport of hazardous materials through the town on Routes 114 and 4A or Interstate-89.

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 Springfield that protect people and property from natural and human-made hazards as well as effectiveness and proposed improvements.

Table VI-1: EXISTING MITIGATION ACTIONS

Existing Mitigation Action	Description	Hazard Type/Service Area	Responsible Local Agent	Effective-ness (Low, Average, High)	Proposed Improvements
Road Design & Road/Bridge Maintenance	State and Local Control of Roads and Bridges	Flood/Town-wide	Highway Dept	High	Install box culvert on Golf Course Road; Replace culverts on Messer Hill Road; Repair Red-Listed Bridges: George Hill Road over Gove Brook 071/138; Star Lake Road over Star Lake outlet (Class VI) 092/052; Pink-listed bridge George Hill Road over Bog Brook 064/152
Emergency Back-Up Power	One stationary and one portable generator at Highway Garage; two portable generators at Fire Station; two portable generators on fire apparatus	Multi-Hazard/Town-wide	Highway Dept	Average	Need generator at Town Building for Town Offices/Police/ Kindergarten
Town Warning System	Siren at Town Offices	Multi-Hazard/central Main Street only	Town emergency services	Low	Can only be heard two miles from Town Offices; No recommended improvements
Planning and Zoning land use regulations	Conservation District Overlays and restrictions	Flood & Erosion/Town-wide	Planning Board	Average	Amend land use regulations to include NH Flood Insurance Program requirements to participate in the program and add restrictions from building in steep slopes and provide maximum grade for driveways.
Town Master Plan	Goals/objectives to plan for growth	Multi-Hazard/Town-wide	Planning Bd	High	Update in 2010

Existing Mitigation Action	Description	Hazard Type/Service Area	Responsible Local Agent	Effective-ness (Low, Average, High)	Proposed Improvements
School Evacuation Plan - Kearsarge District schools (out of Springfield) and Kindergarten	Plan for evacuation/lock down/etc…	Multi-Hazard/Kindergarten, Town Building, Main Street	Police Chief	High	None
Building Code Enforcement	Inspects buildings & issues permits	Flood & Wildfire/Town-wide	Selectboard	Average	No local building codes; No recommended improvements
Fire Safety Inspections	Checks oils burners, wood stoves, daycares, etc.	Wildfire/Town-wide	Fire Chief	High	None
Town Radio	Fire, Police, Highway Radios; NH Fish & Game Department	Multi-Hazard/Town-wide	Town emergency services	High	None**;** if Oak Hill Tower goes out, will use Moose Mountain tower in Hanover
Emergency Operations Plan	Plan to deal with emergencies	Multi-Hazard/Town-wide	Emergency Management Director	High	None; Updating in process
Safety Awareness Program	Fire Prevention and Safety Training	Wildfire/Town-wide	EMD/Fire Dept	High	None
Public Education	Distribute "Emergency Preparedness Guide;" provide information on natural air & water contaminants	Multi-Hazard/Town-wide	EMD/Fire Dept	High	None
Tree Maintenance Program	Performed by State and Town	Multi-Hazard/Town-wide	Highway Dept	High	Purchase chipper
Storm Drain Maintenance	Inspect and maintain culverts	Flood/Town-wide	Highway Dept	Average	None; on-going program
HazMat Spill Program	Midwest Regional HazMat Team	HazMat/Town-wide	Fire Dept	High	None
Mutual Aid	Police/Fire/Ambulance	Multi-Hazard/Town-wide	Police/Fire/ Rescue	High	None

Table VI-2 examines the proposed improvements and evaluates 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.

Table VI-2: PRIORITIZING EXISTING MITIGATION STRATEGY IMPROVEMENTS

Rank	Strategy Improvement	Reduce Damage	Community Objectives	Existing Regulations	Quickly Implemented	Socially Acceptable	Technically Feasible	Administration Possible	Benefit - Cost	TOTAL SCORE	Mitigate Existing or New Development
1	Emergency Operations Plan - Update	2	3	3	3	3	3	3	3	23	Both
2	Culverts & Bridges – Install box culvert on Golf Course Road; Replace culverts on Messer Hill Road; repair red-listed bridges on George Hill Road and Star Lake Road and pink-listed bridge over Bog Brook	3	3	3	2	3	3	2	3	22	Both
2	Emergency Power - Need generator at Town Building for Town Offices/Police/Kindergarten	3	3	3	2	3	3	2	3	22	Both
3	Tree Maintenance Program – Purchase chipper	3	3	3	2	2	3	2	3	21	Both
4	Land Use Regulations - Amend land use regulations to include NH Flood Insurance Program requirements to participate in the program and add restrictions from building in steep slopes and provide maximum grade for driveways.	3	3	1	2	2	3	2	2	18	Both
5	Master Plan - Update	3	3	3	1	2	2	2	2	15	Both

VII. GOALS AND NEWLY IDENTIFIED MITIGATION ACTIONS

A. GOALS & OBJECTIVES

The Springfield Hazard Mitigation Committee reviewed its goals and developed objectives to meet these goals.

Goals

1. To protect the general population, the citizens of the town and guests, from all natural and human-made hazards.

2. To reduce the potential impact of natural and human-made disasters on the town's critical support services, critical facilities, and infrastructure.

3. To reduce the potential impact of natural and human-made disasters on the town's economy.

4. To reduce the potential impact of natural and human-made disasters on the town's natural environment.

5. To reduce the potential impact of natural and human-made disasters on the town's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the Town.

6. To identify, introduce, and implement cost effective hazard mitigation measures to accomplish the town's goals (above) and to raise awareness and acceptance of hazard mitigation.

Objectives

- Protect structures and roads in known flood areas.
- Prohibit new development in areas where hazards will occur.
- Amend the master plan to address natural and human-made hazards.
- Participate in the National Flood Insurance Program.
- Protect houses in the wildland – urban interface from wildfire.
- Educate the public to prepare for hazard emergencies.

B. POTENTIAL MITIGATION ACTIONS

The Springfield Hazard Mitigation Committee brainstormed potential new mitigation actions at a meeting on January 24, 2008.

Multiple Hazards

- *Acquire road closure signs*: These will be used to redirect traffic during hazard event or aftermath (flooding, fire, wind event, hazardous waste spill).
- *Update the 9-1-1 mapping*: There are currently duplicate numbers which causes confusion during an emergency. The updated mapping will correct this problem and will include a forest access roads inventory map to assist in forest fire emergency access and rescue of injured recreational users such as hikers and hunters.
- *Purchase Reverse 9-1-1 services*: "Reverse 911" is an emergency telephone messaging system which provides 911 centers with the technology to deliver customized, pre-recorded voice emergency messages to our citizens. These messages are targeted to specific audiences depending on geographic location and the type of emergency. Examples of use – call all residents regarding the status of impending heavy storm with reminder to stock up on batteries and heating fuel, or call a neighborhood regarding localized flooding.
- *Investigate Maintenance of Class VI roads:* Some Class VI roads have been damaged by overuse and need to be upgraded to remain usable for fire protection and forest management, and rescue of injured recreational users. Investigation is needed to insure the Town is within legal bounds to repair Class VI roads without reversion to Class V status.

C. SUMMARY OF CRITICAL EVALUATION

The Springfield 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.

Table VII-1: PRIORITIZING PROPOSED MITIGATION STRATEGIES

Rank	Strategy	Reduce Damage	Community Objectives	Existing Regulations	Quickly Implemented	Socially Acceptable	Technically Feasible	Administration. Possible	Benefit - Cost	TOTAL SCORE	Mitigate Existing or New Development or Both
1	Road Closure Signs	3	3	3	3	3	3	3	3	24	Both
2	Update the 911 Mapping	3	3	3	2	3	3	2	3	22	Both
3	Purchase Reverse 911	3	3	3	1	3	3	1	2	19	Both
4	Investigate Maintenance of Class VI Roads	2	3	2	1	3	3	1	2	17	Both

The Springfield 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.

VIII. PRIORITIZED IMPLEMENTATION SCHEDULE

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

Table VIII-1: PRIORITIZED IMPLEMENTATION SCHEDULE OF EXISTING PROGRAM IMPROVEMENT ACTIONS

Mitigation Action	Who (Leadership)	When (Fiscal Year)	How (Funding Sources)	Cost (Estimated)
Emergency Operations Plan - Update	Emergency Management Director	2008	Grant (EMPG)	$0 (with "soft match" of labor)
Culverts - Install box culvert on Golf Course Road; Replace culverts on Messer Hill Road; Repair Red-Listed Bridges: George Hill Road over Gove Brook 071/138; Star Lake Road over Star Lake outlet (Class VI) 092/052; Pink-Listed Bridge: George Hill Road over Bog Brook 064/152	Road Agent	2010	Grants & Taxes	Golf Course Road - $100,000 Messer Hill Road - $4,000 George Hill Rd Bridge 071/138 - $50,000 Star Lake Rd Bridge 092/052 - $45,000 George Hill Rd Bridge 064/152 - $70,000
Emergency Power - Need generator at Town Building for Town Offices/Police/ Kindergarten	Selectmen	2013	Taxes	$40,000 including set-up
Tree Maintenance Program – Purchase chipper	Road Agent	2013	Taxes	$20,000
Land Use Regulations - Amend land use regulations to include NH Flood Insurance Program requirements to participate in the program	Planning Board & Selectmen	2009	Taxes	$200
Master Plan - Update	Planning Board	2012	Taxes	$15,000

Figure VIII-1: PRIORITIZED IMPLEMENTATION SCHEDULE OF PROPOSED NEW ACTIONS

Mitigation Action	Who (Leadership)	When (Fiscal Year)	How (Funding Sources)	Cost (Estimated)
Road Closure Signs	Road Agent	2008	Taxes	Barricades - $200 for 10 Signs - $700 for 10
Update the 911 Mapping	Selectmen	2008	State funded	$200
Purchase Reverse 911	Selectmen	2015	Taxes	$50,000 initial purchase; $25,000 annual maintenance
Investigate Maintenance of Class VI Roads	Road Agent; Selectmen	2008-2009	Taxes	$100

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 Springfield will revisit the Hazard Mitigation Plan *annually, or after a hazard event*. The Springfield Emergency Management Director will initiate this review and should 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, to determine feasibility for future implementation. 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 as an Annex to the recently updated Emergency Operations Plan (EOP), and it will be updated annually along with the EOP. In addition, the Board of Selectmen, during the Capital Improvement Process, will review and include any proposed structural projects outlined in this 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 hearing) to inform and educate members of the public. Additionally, a press release will be distributed, and information will be posted on the Town website.

Copies of the Hazard Mitigation Plan have been or will be sent to the following parties for review and comment:

- Selectmen's Offices in neighboring towns
- Jeremy LaPlante, Field Representative, NH Homeland Security & Emergency Management
- Richard Verville, NH Homeland Security & Emergency Management
- Board of Selectmen, Springfield
- 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)

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) www.meteo.mcgill.ca/extreme/Related_Info.htm#disname

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

Town of Springfield Emergency Management Plan (2002)

Town of Springfield Master Plan (2005)

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 Bureau of Emergency Management (now, NH Homeland Security & Emergency Management) *State of New Hampshire Natural Hazard Mitigation Plan* (2004)

www.fema.gov/news/disasters.fema: Website for FEMA's Disaster List

www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms: Website for National Oceanic & Atmospheric Administration Disaster List

www.tornadoproject.com: Website for The Tornado Project

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

www.nesec.org: Website for Northeast States Emergency Consortium

http://earthquake.usgs.gov/research/hazmaps/products_data/2002/ceus2002.php: Website for area earthquake information

APPENDICES

Appendix A: **Technical Resources**

Appendix B: **Technical and Financial Assistance**

Appendix C: **Matrix of Federal All-Hazards Grants**

Appendix D: **Meeting Documentation**

Appendix E: **Map of Past and Potential Hazard Event Areas and Critical Facilities**

Appendix F: **Map of Wildland – Urban Interface for Wildfire Hazard Areas**

APPENDIX A:

TECHNICAL RESOURCES

1) Agencies

New Hampshire Homeland Security & Emergency Management 271-2231
Federal Emergency Management Agency ..... (617) 223-4175
NH Regional Planning Commissions:
  Upper Valley Lake Sunapee Regional Planning Commission 448-1680
NH Executive Department:
  Governor's Office of Energy and Community Services 271-2611
  New Hampshire Office of State Planning 271-2155
NH Department of Cultural Affairs: 271-2540
  Division of Historical Resources 271-3483
NH Department of Environmental Services: 271-3503
  Air Resources 271-1370
  Waste Management 271-2900
  Water Resources 271-3406
  Water Supply and Pollution Control 271-3504
  Rivers Management and Protection Program 271-1152
NH Office of Energy and Planning 271-2155
NH Municipal Association 224-7447
NH Fish and Game Department 271-3421
NH Department of Resources and Economic Development: 271-2411
  Natural Heritage Inventory 271-3623
  Division of Forests and Lands 271-2214
  Division of Parks and Recreation 271-3255
NH Department of Transportation 271-3734
Northeast States Emergency Consortium, Inc. (NESEC) ..... (781) 224-9876
US Department of Commerce:
  National Oceanic and Atmospheric Administration:

National Weather Service; Gray, Maine 207-688-3216

US Department of the Interior:
US Fish and Wildlife Service 225-1411
US Geological Survey 225-4681
US Army Corps of Engineers..... (978) 318-8087
US Department of Agriculture:
Natural Resource Conservation Service 868-7581

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) ..... NH Homeland Security & Emergency Management
406 Public Assistance and Hazard Mitigation ..... NH Homeland Security & Emergency Management
Community Development Block Grant (CDBG)..... NH HSEM, NH OEP, also refer to RPC
Dam Safety Program ..... NH Department of Environmental Services
Disaster Preparedness Improvement Grant (DPIG) ..... NH Homeland Security & Emergency Management
Emergency Generators Program by NESEC‡ ..... NH Homeland Security & Emergency Management
Emergency Watershed Protection (EWP) Program ..... USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP) ..... NH Homeland Security & Emergency Management
Flood Plain Management Services (FPMS) ..... US Army Corps of Engineers
Mitigation Assistance Planning (MAP) ..... NH Homeland Security & Emergency Management
Mutual Aid for Public Works..... NH Municipal Association
National Flood Insurance Program (NFIP) † ..... NH Office of Energy and Planning
Power of Prevention Grant by NESEC‡ ..... NH Homeland Security & Emergency Management
Project Impact..... NH Homeland Security & Emergency Management
Roadway Repair & Maintenance Program(s) ..... NH Department of Transportation
Section 14 Emergency Stream Bank Erosion & Shoreline Protection..... US Army Corps of Engineers
Section 103 Beach Erosion..... US Army Corps of Engineers
Section 205 Flood Damage Reduction..... US Army Corps of Engineers
Section 208 Snagging and Clearing ..... US Army Corps of Engineers
Shoreland Protection Program..... NH Department of Environmental Services
Various Forest and Lands Program(s)..... NH Department of Resources and Economic Development
Wetlands Programs..... ….NH Department of Environmental Services

‡NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH OEM for more information.

† 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

Sponsor	Internet Address	Summary of Contents
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 Dept. of Energy.
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iiaa.iix.com/ndcmap.htm	A multi-disaster risk 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:

Technical and Financial Assistance

APPENDIX B: TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION

Note – Communities must have an approved Hazard Mitigation Plan to be eligible for HMGP and PDM grants.

Hazard Mitigation Grant Program - "Section 404 Mitigation"

The Hazard Mitigation Grant Program (HMGP) in New Hampshire is administered in accordance with the 404 HMGP Administration Plan which was derived under the authority of Section 404 of the Stafford Act in accordance with Subpart N. of 44 CFR.

The program receives its funding pursuant to a Notice of Interest submitted by the Governor's Authorized Representative (or GAR, i.e. the Director of NHOEM) to the FEMA Regional Director within 60 days of the date of a Presidentially Declared Disaster. The amount of funding that may be awarded to the State/Grantee under the HMGP may not exceed 15% of (over and above) the overall funds as are awarded to the State pursuant to the Disaster Recovery programs as are listed in 44 CFR Subpart N. Section 206.431 (d) (inclusive of all Public Assistance, Individual Assistance, etc.). Within 15 days of the Disaster Declaration, an Inter-Agency Hazard Mitigation Team is convened consisting of members of various Federal, State, County, Local and Private Agencies with an interest in Disaster Recovery and Mitigation. From this meeting, a Report is produced which evaluates the event and stipulates the State's desired Mitigation initiatives.

Upon the GAR's receipt of the notice of an award of funding by the Regional Director, the State Hazard Mitigation Officer (SHMO) publishes a Notice of Interest (NOI) to all NH communities and State Agencies announcing the availability of funding and solicits applications for grants. The 404 Administrative Plan calls for a State Hazard Mitigation Team to review all applications. The Team is comprised of individuals from various State Agencies.

Eligible Subgrantees include:

- State and Local governments,
- Certain Not for Profit Corporations
- Indian Tribes or authorized tribal organizations
- Alaskan corporations not privately owned.

Minimum Project Criteria

- Must conform with the State's "409" Plan
- Have a beneficial impact on the Declared area
- Must conform with:
- NFIP Floodplain Regulations
- Wetlands Protection Regulations
- Environmental Regulations
- Historical Protection Regulations
- Be cost effective and substantially reduce the risk of future damage
- Not cost more than the anticipated value of the reduction of both direct damages and subsequent negative impacts to the area if future disasters were to occur i.e., min 1:1 benefit/cost ratio
- Both costs and benefits are to be computed on a "net present value" basis
- Has been determined to be the most practical, effective and environmentally sound alternative after a consideration of a range of options
- Contributes to a long-term solution to the problem it is intended to address
- Considers long-term changes and has manageable future maintenance and modification requirements

Eligible Projects may be of any nature that will result in the protection to public or private property and include:

- Structural hazard control or protection projects
- Construction activities that will result in protection from hazards
- Retrofitting of facilities
- Certain property acquisitions or relocations
- Development of State and local mitigation standards
- Development of comprehensive hazard mitigation programs with implementation as an essential component
- Development or improvement of warning systems

Flood Mitigation Assistance (FMA) Program

New Hampshire has been a participant in the Flood Mitigation Assistance Program (FMA or FMAP) since 1996/97. In order to be eligible, a community must be a participant in the National Flood Insurance Program.

In 1997, the State was awarded funds to assist communities with Flood Mitigation Planning and Projects. A Planning Grant from the 1996/97 fund was awarded to the City of Keene in 1998. In preparation for the development of the Flood Mitigation Plan, the Planning Department of the City of Keene created a digital data base of its floodplain including the digitizing of its tax assessing maps as well as its Special Flood Hazard Areas in GIS layers. The Plan Draft was submitted to FEMA for review and approval in March of 2000. The Plan includes a detailed inventory of projects and a "model" project prioritization approach.

Flood Mitigation Assistance Program

- NFIP Funded by a % of Policy Premiums
- Planning Grants
- Technical Assistance Grants to States (10% of Project Grant)
- Project Grants to communities
- Communities must have FEMA approved Flood Mitigation Plan to receive Project Funds

In 1998, the FMAP Planning Grant was awarded to the Town of Salem. Given the complexity of the issues in the Spicket River watershed, the Town of Salem subcontracted a substantial portion of the development of its Flood Mitigation Planning to SFC Engineering Partnership of Manchester, NH, a private engineering firm. Salem submitted a Plan and proposed projects to the State and FEMA in May of 1999 which were approved by FEMA. This made Salem the first community in NH to have a FEMA/NFIP approved Flood Mitigation Plan.

PRE-DISASTER MITIGATION PROGRAM (PDM)

Eligible Projects

(44 CFR Part 78)

- Elevation of NFIP insured residential structures
- Elevation and dry-proofing of NFIP insured non-residential structures
- Acquisition of NFIP insured structures and underlying real property
- Relocation of NFIP insured structures from acquired or restricted real property to sites not prone to flood hazards
- Demolition of NFIP insured structures on acquired or restricted real property
- Other activities that bring NFIP insured structures into compliance with statutorily authorized floodplain management requirements
- Beach nourishment activities that include planting native dune vegetation and/or the installation of sand-fencing.
- Minor physical mitigation projects that do not duplicate the flood prevention activities of other Federal agencies and lessen the frequency of flooding or severity of flooding and decrease the predicted flood damages in localized flood problem areas. These include: modification of existing culverts and bridges, installation or modification of flood gates, stabilization of stream banks, and creation of small debris or flood/storm water retention basins in small watersheds (not dikes, levees, seawalls etc.)

FEMA has long been promoting disaster resistant construction and retrofit of facilities that are vulnerable to hazards in order to reduce potential damages due to a hazard event. The goal is to reduce loss of life, human suffering, economic disruption, and disaster costs to the Federal taxpayer. This has been, and continues to be accomplished, through a variety of programs and grant funds.

Although the overall intent is to reduce vulnerability before the next disaster threatens, the bulk of the funding for such projects actually has been delivered through a "post-disaster" funding mechanism, the Hazard Mitigation Grant Program (HMGP). This program has successfully addressed the many

hazard mitigation opportunities uniquely available following a disaster. However, funding of projects "pre-disaster" has been more difficult, particularly in states that have not experienced major disasters in the past decade. In an effort to address "pre-disaster mitigation", FEMA piloted a program from 1997-2001 entitled "Project Impact" that was community based and multi-hazard oriented.

Through the Disaster Mitigation Act of 2000, Congress approved creation of a national Predisaster Hazard Mitigation program to provide a funding mechanism that is not dependent on a Presidential disaster declaration. For FY2002, $25 million has been appropriated for the new grant program entitled the Pre-Disaster Mitigation Program (PDM). This new program builds on the experience gained from Project Impact, the HMGP, and other mitigation initiatives.

Here are the high points of the FY 2002 PDM program:

The program will be administered by each State, with a base allocation of $250,000, and additional funds provided via a population formula.

Eligible projects include:

State and local hazard mitigation planning
Technical assistance [e.g. risk assessments, project development]
Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits
- Minor structural hazard control or protection projects

Community outreach and education [up to 10% of state allocation]

The emphasis for FY2002 will be on mitigation planning, to help localities meet the new planning requirements of the Disaster Mitigation Act of 2000.

Each state establishes grant selection criteria and priorities based on:

The State Hazard Mitigation Plan
The degree of commitment of the community to hazard mitigation
The cost effectiveness of the proposed project
The type and degree of hazard being addressed

For project grants, "good standing" of the community in the National Flood Insurance Program

The funding is 75% Federal share, 25% non-Federal, except as noted below. The grant performance periods will be 18 months for planning grants, and 24 months for mitigation project grants. The PDM program is available to regional agencies and Indian tribes. Special accommodation will be made for "small and impoverished communities", who will be eligible for 90% Federal share, 10% non-Federal.

Disaster Preparedness Improvement Grant (DPIG)

FEMA and the State co-sponsor the DPIG Program, which supports the development and updating of disaster assistance plans and capabilities and promotes educational opportunities with respect to preparedness and mitigation. Authority: See Subchapter E. of 44 CFR.

Past DPIG initiatives include:

- Support of the position of Protection Planner/Hazard Mitigation Officer
- Installation of river gauges
- Support of the NH State Environthon School Program
- Coordinate the Voluntary Organizations Active in Disasters (VOAD) Program (See Resource Profile Annex) NHOEM via the DPIG has sponsored annual meetings with training workshops
- Sponsoring Dam Safety Training initiatives and workshops
- Production and distribution of a handbook for small embankment dam owners
- Inventory of the State's Dams
- Review of Dam Plans
- Sponsored extensive statewide, two day workshops for Granite State Incident Stress Debriefing Teams and funded educational materials
- Community visits and production of informational materials
- Assist with Plan Annex update for local Haz Mat planning.
- Funding workshops for NH Road Agents in cooperation with the T2 program of the Technology Transfer Center at the University of New Hampshire

Disaster Preparedness Improvement Grant

- ***Evaluate natural hazards on a continuing basis and develop programs and actions required to mitigate such hazards***
- ***Provide Technical Assistance***
- ***Grants to States of up to $50,000 annually***
- ***(50% State match - cash or in kind)***

Eligible Projects Include:

- Evaluations of Natural Hazards
- Hazard Mitigation activities (i.e. Plan/ policy/program/strategy development
- Plan updates
- Handbooks: publication & distribution
- Creating exercise materials
- Developing Standard Operating Procedures
- Training state employees
- Report of formal analysis of State enabling legislation and authorities
- Update inventory of State/local Critical Facilities
- Develop a tracking system of critical actions to be taken post-event
- Creating Damage Assessment Plans and defining procedures
- Developing Plans for procedures when no Federal Aid is forthcoming
- Creating Plans for Search and Rescue Operations
- Developing Disaster accounting procedures

This list is not exhaustive

Present DPIG funded Hazard Mitigation initiatives

- Support the position of Protection Planner/Hazard Mitigation Officer
- Continued support of the Environthon Program
- Development of this Plan
- Providing Technical Assistance to State and local officials
- Development of Emergency Operations Plans (EOPs) for Significant and High Hazard dams

Future DPIG funded Hazard Mitigation initiatives

- Continued Support the position of Protection Planner/Hazard Mitigation Officer
- Continued support of the Environthon Program
- Update and maintenance of this Plan
- Provide Technical Assistance to State and local officials
- Support of other planning, technical assistance and training as indicated
- Digitization of EOPs for the State's "Significant" and "High Hazard" dams to provide rapid access to information in Emergency situations and to facilitate Plan maintenance.

Community Development Block Grant

- ***U.S. Dept. of Housing and Urban Development***
- ***Funds for a Declared Disaster's "Unmet Needs"***
- ***Projects must meet one of three National Objectives***
- ***Provide a direct benefit to low and moderate income persons or households***
- ***Prevent or eliminate slums and blight***
- ***Eliminate conditions which seriously and immediately threaten the public health and welfare***

Additional conditions with respect to the expenditure of these funds includes the provision that at least 50% of the grant award must be expended in a manner which benefits individuals who earn 80% or less than the area's (county's) median income.

Community Development Block Grant Program

These Federal funds are provided through the U.S. Department of Housing and Urban Development (HUD) and are administered by the CDBG Program of the New Hampshire Office of State Planning.

Some CDBG disaster related funding has been transferred to FEMA recently and the SHMO is scheduled to receive guidance as to which specific funds and, new program management criteria.

The specific CDBG funds designated for hazard mitigation purposes are made available to address "unmet needs" pursuant to a given Disaster Declaration to States which request them. For these funds, project selection guidance is provided by NHOEM and NHOSP administers the grant.

Pursuant to Declaration DR-1144-NH, $557,000.00 was made available to the State and pursuant to DR-1199-NH, the grant award is targeted at $1,500,000.00.

In October of 1998, HUD announced the program guidelines for the expenditure of the DR-1144-NH related funding and the community of Salem applied for, and has received preliminary approval for funding to acquire a 19 unit trailer park in the Floodplain.

Mitigation Programs of Other NH State Agencies

The following agencies of the State of New Hampshire are directly or indirectly involved in activities that include Hazard Mitigation Planning and/or program implementation.

NH DOT Bureau of Repair and Maintenance
NH OSP/NFIP Program
NH OSP Coastal Program
NH DRED Division of Forests and Lands
NH DES Water Resources Division – Dam Safety Program
NH DES Wetlands Program
NH DES Shoreline Protection Program

APPENDIX C:

Matrix of Federal All-Hazards Grants

Appendix C: Matrix of Federal All-Hazards Grants

This matrix provides information about key all-hazards grant programs from the Departments of Homeland Security, Justice, Transportation, Health and Human Services, and Education under which state, local, and tribal governments, first responders, and the public are eligible to receive preparedness, response, recovery, mitigation, and prevention assistance. It lists the purpose of the program, amount appropriated for this program in FY 2002 and 2003, and the website where additional information can be found.2

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
Preparedness					Programs to prepare the Nation to address the consequences of natural and human-made disasters and emergencies.	
Department of Homeland Security	Border and Transportation Security Directorate	State Homeland Security Grant Program www.ojp.usdoj.gov	See DOJ State Domestic Preparedness Grant Program	$566.3 million $39.7 M Planning $29.8 M Training $99.3 M Exercises $397.4 M Equipment	To provide for the purchase of specialized equipment to enhance the capability of state and local agencies to prevent and respond to incidents of terrorism involving the use of chemical, biological, radiological, nuclear or explosive (CBRNE) weapons; for the protection of critical infrastructure and prevention of terrorist incidents; for costs related to the design, development, conduct and evaluation of CBRNE exercises; for costs related to the design, development and conduct of a state CBRNE Training Program; and for costs associated with updating and implementing each state's Homeland Security Strategy.	State and local governments; first responders

[2] FY03 funding information for some grant programs and cooperative agreements are not yet available.

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Emergency Management Performance Grants www.fema.gov	$134 million	$165 million	To provide basic assistance to sustain the nation's emergency management system, build state and local emergency management capability, and serve as the foundation for first responder activities.	States with pass through to local emergency management organizations
	Emergency Preparedness and Response Directorate	Assistance to Firefighters Grant Program www.usfa.fema.gov/grants	$360 million	$750 million	To provide direct assistance to local fire departments in order to support basic levels of capability to protect the health and safety of the public and firefighting personnel against fire and fire-related hazards, and to provide assistance for fire prevention programs	Local Fire Departments
	Emergency Preparedness and Response Directorate	State and Local Emergency Operations Planning Grants www.fema.gov	$100 million	$0	To provide funding assistance to States and local governments to update their all-hazards Emergency Operations Plans, with an emphasis making sure WMD hazards are covered in the plans.	States with a pass through to local governments
	Emergency Preparedness and Response Directorate	State and Local Emergency Operation Centers (EOCs) www.fema.gov	$56 million	$25 million	To address the most immediate EOC needs nationwide to build state and local capabilities to respond to all-hazards, including acts of terrorism.	States; local governments may be sub-grantees of the State
	Emergency Preparedness and Response Directorate	Citizen Corps www.citizencorps.gov	$4 million	$0	To support the formation of state and local Citizen Corps Councils to help drive local citizen participation by coordinating Citizen Corps programs, developing community action plans, assessing possible threats and identifying local resources to make communities safer, stronger, and better prepared to respond to the threats of terrorism, crime, public health issues, and disasters of all kinds.	States with a pass through to local governments

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Community Emergency Response Teams www.fema.gov	$17 million	$18.8 million	To train people in neighborhoods, the workplace, and schools in basic disaster response skills, such as fire suppression, urban search and rescue, and medical operations, and helps them take a more active role in emergency preparedness.	States with pass through to local jurisdictions
	Emergency Preparedness and Response Directorate	National Fire Academy Training Grants www.fema.gov	$1.2 million	$1.2 million	To provide financial assistance to State Fire Training Systems for the delivery of a variety of National Fire Academy courses/programs.	State fire training organizations
	Emergency Preparedness and Response Directorate	Emergency Management Institute Training Assistance www.fema.gov	$1.4 million	$1.4	To defray travel and per diem expenses of State, local and tribal emergency management personnel who attend training courses conducted by the Emergency Management Institute, at the Emmitsburg, Maryland facility; Bluemont, Virginia facility; and selected off-site locations. Its purpose is to improve emergency management practices among State, local and tribal government managers, in response to emergencies and disasters. Programs embody the Comprehensive Emergency Management System by unifying the elements of management common to all emergencies: planning, preparedness, mitigation, response, and recovery.	State, local, and tribal emergency managers

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Hazardous Materials Assistance Program (CERCLA Implementation)	$330,000	200,000	Provide technical and financial assistance through the States to support State, local and tribal governments in oil and hazardous materials emergency planning and exercising. To support the Comprehensive Hazardous Materials (HAZMAT) Emergency Response – Capability Assessment Program (CHER-CAP) activities.	State, local, and tribal governments, state emergency response committees, local emergency planning commissions
	Emergency Preparedness and Response Directorate	Interoperable Communications Equipment Grant	$0	$25 million	To facilitate communications interoperability among public safety emergency responders at the state and local level. (This funding is being coordinated with funding provides through COPS.)	N/A
	Emergency Preparedness and Response Directorate	SARA Title III Training Program www.fema.gov	$193,000	$187,000	To make funding available to provide training in support of Tribal governments emergency planning, preparedness, mitigation, response, and recovery capabilities. These programs must provide special emphasis on emergencies associated with hazardous chemicals.	Indian tribal governments
	Emergency Preparedness and Response Directorate	Chemical Stockpile Emergency Preparedness Program www.fema.gov	$64.8 million	$72.1 million	A cooperative agreement to enhance emergency preparedness capabilities of the States and local communities at each of the eight chemical agent stockpile storage facilities. The purpose of the program is to assist States and local communities in efforts to improve their capacity to plan for and respond to accidents associated with the storage of chemical warfare materials.	State and local governments and the general public in the vicinity of the eight chemical agent stockpile storage facilities.

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
Department of Justice	Emergency Preparedness and Response Directorate	Metropolitan Medical Response System www.mmrs.hhs.gov	See HHS MMRS Grant	$50 million	To provide contractual funding to the 122 largest metropolitan jurisdictions to sustain and enhance the integrated medical response plans to a WMD terrorist attack.	Local governments
	Office of Domestic Preparedness	State Domestic Preparedness Equipment Support Program www.usdoj.gov	$315.7 million $301.7 M Equipment $14 M Exercises	See State Homeland Security Grant Program	Funding will be provided to enhance first responder capabilities, and to provide for equipment purchases and exercise planning activities for response to Weapons of Mass Destruction (WMD) domestic terrorist incidents.	State and local governments
	National Institutes of Justice	Domestic Anti-Terrorism Technology Development Program www.usdoj.gov/nij	$47 million	N/A	To support the development of counter terrorism technologies, assist in the development of standards for those technologies, and work with state and local jurisdictions to identify particular areas of vulnerability to terrorist acts and be better prepared to respond if such acts occur.	States and local governments, nonprofit and for profit organizations, universities
	Office of Community Oriented Police Services (COPS)	COPS Interoperable Communications Technology Program www.cops.usdoj.gov	N/A	$19.9 million	To facilitate communications interoperability public safety responders at the state and local level.	Tribal, State, and local law enforcement agencies
Department of Health and Human Services		Public Health and Social Services Emergency Fund www.hhs.gov	$242.9 million	$2.3 billion $514 M Hospital Preparedness $940 M Public Health Preparedness	To continue to prepare our nation's public health system and hospitals for possible mass casualty events, and to accelerate research into new treatments and diagnostic tools to cope with possible bioterrorism incidents.	Individuals, families, Federal, State, and local government agencies and emergency health care providers

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Health Resources and Services Administration	State Rural Hospital Flexibility Program www.ruralhealth.hrsa.gov	$25 million	$25 million	To help States work with rural communities and hospitals to develop and implement a rural health plan, designate critical access hospitals (CAHs), develop integrated networks of care, improve emergency medical services and improve quality, service and organizational performance.	States with at least one hospital in a non-metropolitan region
	Health Resources and Services Administration	EMS for Children www.hrsa.gov	$18.9 million	$19.5 million	To support demonstration projects for the expansion and improvement of emergency medical services for children who need treatment for trauma or critical care. It is expected that maximum distribution of projects among the States will be made and that priority will be given to projects targeted toward populations with special needs, including Native Americans, minorities, and the disabled.	State governments and schools of medicine
	National Institute of Health	Superfund Hazardous Substances Basic Research and Education www.nih.gov	$25 million	$48.9 million	To establish and support an innovative program of basic research and training consisting of multi-project, interdisciplinary efforts that may include each of the following: (1) Methods and technologies to detect hazardous substances in the environment; (2) advance techniques for the detection, assessment, and evaluation of the effects of hazardous substances on humans; (3) methods to assess the risks to human health presented by hazardous substances; and (4) and basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances.	Any public or private entity involved in the detection, assessment, evaluation, and treatment of hazardous substances; and State and local governments
		Metropolitan Medical Response System www.mmrs.hhs.gov	$25 million	See EP&R MMRS Grant	To provide contractual funding to the 122 largest metropolitan jurisdictions to sustain and enhance the integrated medical response plans to a WMD terrorist attack.	Local governments

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Centers for Disease Control	Immunization Research, Demonstration, Public Information and Education www.cdc.gov	$9 million	$9 million	To assist States, political subdivisions of States, and other public and private nonprofit entities to conduct research, demonstrations, projects, and provide public information on vaccine-preventable diseases and conditions.	States and nonprofits organizations
	Centers for Disease Control	Surveillance of Hazardous Substance Emergency Events www.atsdr.cdc.gov	$1.32 million	$1.84 million	To assist State health departments in developing a State-based surveillance system for monitoring hazardous substance emergency events. This surveillance system will allow the State health department to better understand the public health impact of hazardous substance emergencies by developing, implementing, and evaluating a State-based surveillance system.	State, local, territorial, and tribal public health departments
	Centers for Disease Control	Human Health Studies, Applied Research and Development www.atsdr.cdc.gov	$1.5 million	$1.8 million	To solicit scientific proposals designed to answer public health questions arising from situations commonly encountered at hazardous waste sites. The objective of this research program is to fill gaps in knowledge regarding human health effects of hazardous substances identified during the conduct of ATSDR's health assessments, consultations, toxicological profiles, and health studies, including but not limited to those health conditions prioritized by ATSDR.	State health departments
Department of Education		School Emergency Response and Crisis Management Plan Discretionary Grant Program www.ed.gov/emergencyplan/	N/A	$30 million	To provide school districts with funds to strengthen and improve current school crisis plans in preparation for emergencies including potential terrorist attacks.	School Districts

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
Department of Transportation	Research and Special Programs Administration	Hazardous Materials Emergency Preparedness Training and Planning Grants www.rspa.dot.gov	$12.8 million	$12.8 million	Increase state, local, territorial, and Native American tribal effectiveness to safely and efficiently handle HazMat accidents and incidents; enhance implementation of the Emergency Planning and Community Right-to-Know Act of 1986; and encourage a comprehensive approach to emergency planning and training by incorporating response to transportation standards.	States, local, territorial, tribal governments.
Response					Programs to coordinate Federal response efforts and to assists states, localities, and tribes in responding to disasters and emergencies.	
Department of Homeland Security	Emergency Preparedness and Response Directorate	Urban Search and Rescue www.fema.gov	$32.4 million	$60 million	To expand the capabilities of existing Urban Search and Rescue Task Forces.	28 existing US&R Task Forces
Recovery					Programs to provide assistance to States, localities, tribes, and the public to alleviate suffering and hardship resulting from Presidentially declared disasters and emergencies caused by all types of hazards.	
Department of Homeland Security	Emergency Preparedness and Response Directorate	Individual Assistance	$256 million (as of 4/03 for disasters and emergencies declared in FY02; additional funding expected as assistance is provided; FY01=$1.39 billion as of 4/03)	N/A	To provide assistance to individuals and families who have been affected by natural or human-made Presidentially declared disasters. Funding provided from the Disaster Relief Fund.	Individuals and Families

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
	Emergency Preparedness and Response Directorate	Public Assistance	$519 million (as of 4/03 for disasters and emergencies declared in FY02; additional funding expected as assistance is provides; FY01=$3.6 billion as of 4/03)	N/A	To provide assistance to states, localities, tribes, and certain non-profit organizations affected by natural or human-made Presidentially declared disasters. Funding provided from the Disaster Relief Fund	State, local and tribal governments; private non-profit organizations
	Emergency Preparedness and Response Directorate	Fire Management Assistance Grant Program	$56 million (as of 4/03; for fires declared in FY02; additional funding is expected as assistance is provided)	N/A	Provide funds to States, local, and tribal governments for the mitigation, management, and control of wildland fires posing serious threats to improved property.	State, local and tribal governments
Small Business Administration	Office of Disaster Assistance	Disaster Loan Program www.sba.gov/disaster/			To offer financial assistance to those who are trying to rebuild their homes and businesses in the aftermath of a disaster.	Individuals, families, private sector
Department of Justice	Office for Victims of Crime	Antiterrorism and Emergency Assistance Program www.usdoj.gov	Based on Need of Applicant Community	Based on Need of Applicant Community	To provide assistance programs for victims of mass violence and terrorism occurring within and outside the United States and a compensation program for victims of international terrorism.	Public and private nonprofit victim assistance agencies
Mitigation					Programs to reduce or eliminate future risk to lives and property from disasters.	

Agency	Office/ Directorate	Program	Amount (FY 02)	Amount (FY 03)	Purpose	Funding Beneficiaries
Department of Homeland Security	Emergency Preparedness and Response Directorate	Hazard Mitigation Grant Program	$16.5 million (as of 4/03 for disasters declared in FY02; additional funding expected as assistance is provided; FY01=$319 million as of 4/03)	N/A	To provide assistance to states, localities, and tribes to fund projects that will reduce the loss of lives and property in future disasters. Funding is provides from the Disaster Relief Fund and administered by the states according to their own priorities.	State, local, and tribal governments
	Emergency Preparedness and Response Directorate	Pre-Disaster Mitigation Program	$25 million	$150 million	This program provides funding for mitigation activities before disaster strikes. In recent years it has provided assistance for mitigation planning. In FY03, Congress passes a competitive pre-disaster mitigation grant program that will include project funding.	State, local, and tribal governments
	Emergency Preparedness and Response Directorate	Map Modernization	$11 million	$33 million	This funding provides assistance to develop digital flood maps, support flood-mapping activities and expand the Cooperating Technical Partners Program to communities and regional entities.	State, local and tribal governments
Prevention					Programs to interdict potentially hazardous events from occurring	
Department of Health and Human Services	Centers for Disease Control	Immunization Grants www.cdc.gov	$350 million (317 Grants) $745 million (VFC Grants)	$403 million (317 Grants) $772.3 million (VFC Grants)	To assist States and communities in establishing and maintaining preventive health service programs to immunize individuals against vaccine-preventable diseases.	States

APPENDIX D:

Meeting Documentation

Appendix D: Meeting Documentation

AGENDAS:

Thursday, October 4, 2007

6:00 – 9:00 p.m.

1. Introduction
2. Hazard Identification
3. Critical Facility Identification
4. Determine Development Trends
5. Complete Risk Assessment
6. Identify Mitigation Actions that are Already in Place
7. Set Goals for the Next Meeting

Thursday, January 24, 2008

6:00 – 9:00 p.m..

1. Introduction and Sign-in
2. Review Information from the Last Meeting
3. Analyze Development Trends
4. Brainstorm Potential Mitigation Actions
5. Evaluate Mitigation Actions
6. Develop Implementation Schedule for Mitigation Actions
7. Discuss Adoption and Updates of the Plan
8. Schedule a Meeting to Review the Draft Plan

Thursday, February 21, 2008

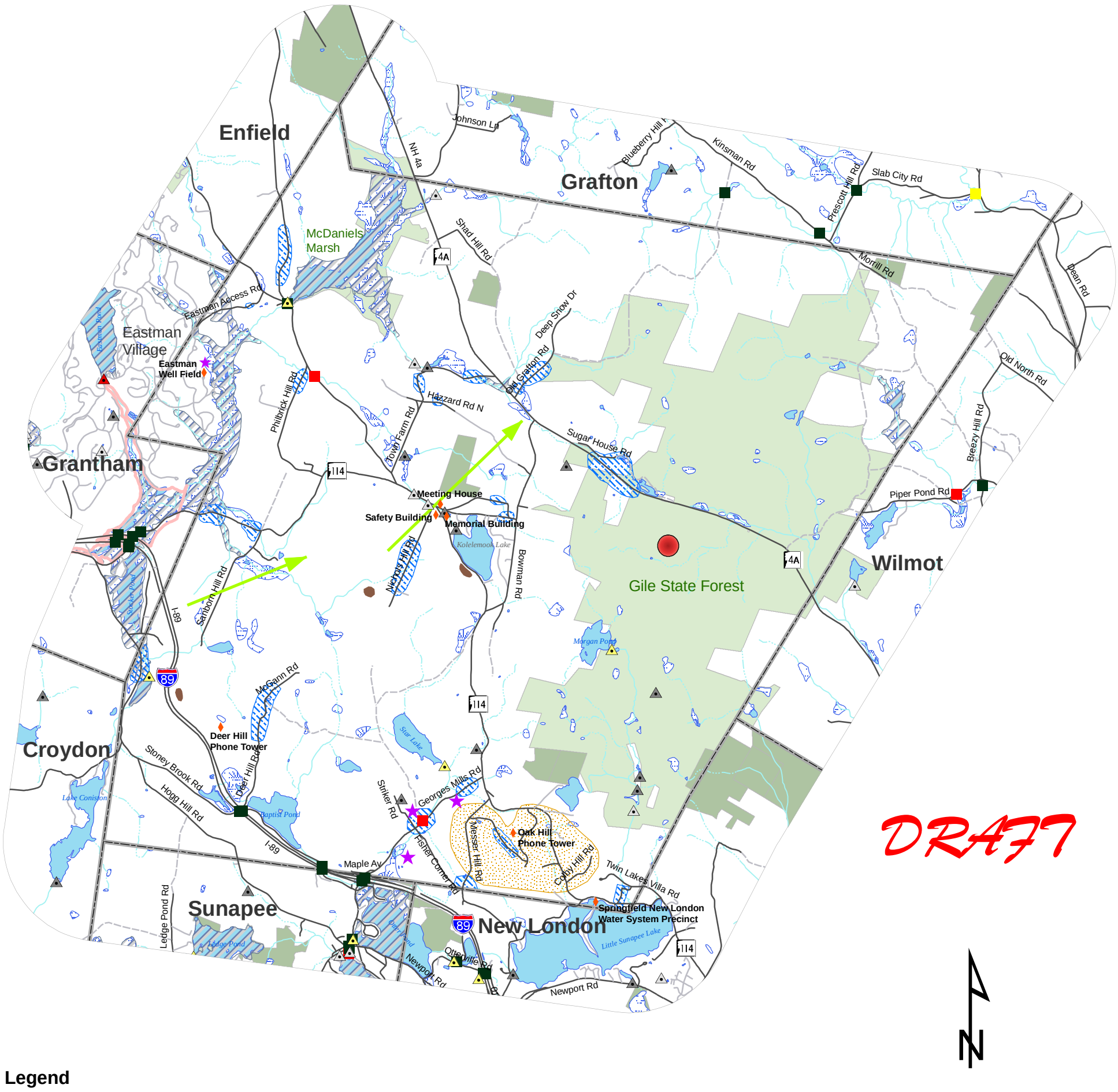
6:00 – 7:30 p.m.

Review draft for submittal to Selectboard and State

APPENDIX E:

Map of Past and Potential Hazard Event Areas and Critical Facilities

Map of Past and Potential Hazard Event Areas and Critical Facilities
Springfield, New Hampshire



DRAFT

Legend

Dam Hazard
- High hazard potential
- Significant hazard potential
- Low hazard potential
- Non Menace
- Ruins, removed, breached, unbuilt, or exempt

Bridges in State Inventory
- Red List: Priority for Repair
- Functionally Obsolete
- Other

- Critical Facilities

Flood Hazards
- FEMA 100-Year Flood Area
- Town-Identified Flooding

Other Hazards
- Dam Failure Hazard
- Erosion Hazard
- Wildfire Hazard
- Windstorm Hazard
- Hazardous Material Generators
- Landslide Hazard

Roads
- State or Local Road
- Road Not Maintained
- Private Road

- Town Forest
- State-Owned Land
- Intermittent Stream
- Perennial Stream
- Lake, Pond, Reservoir
- Swamp, Marsh

Miles
0 1 2 3 4

1:70,000 1 inch equals 1.1 miles

Upper Valley Lake Sunapee Regional Planning Commission

Map created by Upper Valley Lake Sunapee Regional Planning Commission, February 2008.

Data Sources:
Bridge condition data from NH DOT, 2007. Dams from NH DES, 12/06. 100-year floodplains from FEMA digital flood insurance rate maps, 2008.
Dam failure hazard area for Eastman Lake Dam, Grantham, NH, from Emergency Action Plan submitted by dam owner to NH DES; data supplied from NH DES Dam Bureau, 2007.
Other hazard areas and critical facilities located by residents of Dorchester and digitized by UVLSRPC, 2008.
Water features from NH Hydrography Dataset, 2006. Public Lands data distributed by NH GRANIT, 2008. Roads data from NH DOT, 2007.

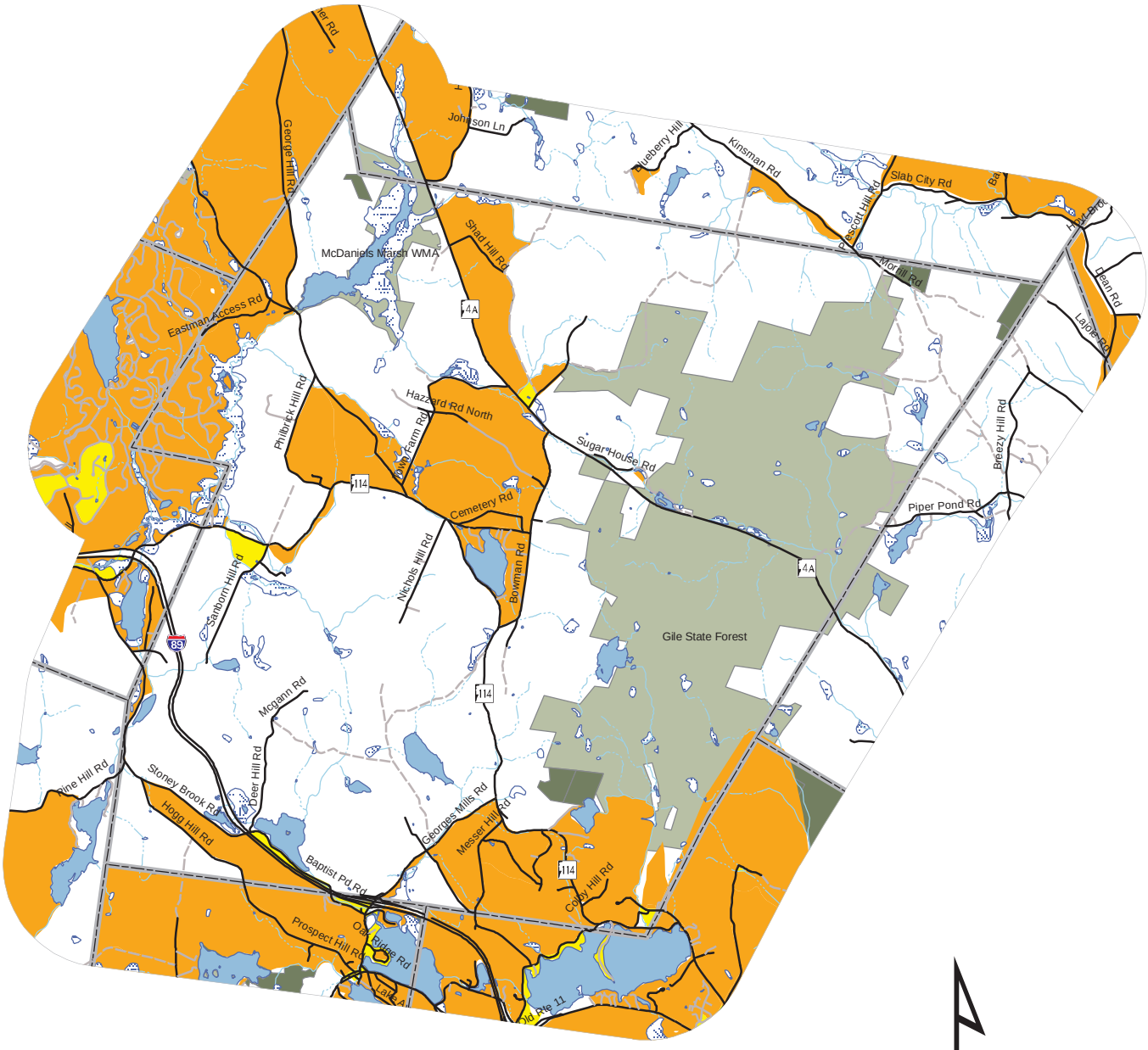
Disclaimer:
Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center (CSRC), under contract to the Office of Energy and Planning (OEP), and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. OEP, CSRC, and the cooperating agencies make no claim as to the validity or reliability or to any implied uses of these data.

APPENDIX F

Map of Wildland – Urban Interface Map

for Wildfire Hazard Area

Map of Wildland - Urban Interface for Wildfire Hazard Areas



Legend

Wildfire Hazard

- Wildland-Urban Interface
- Wildland-Urban Intermix

Roads

- State or Local Road
- Road Not Maintained
- Private Road

- Town Forest
- State-Owned Land
- Intermittent Stream
- Perennial Stream
- Lake, Pond, Reservoir
- Swamp, Marsh

Miles
0 1 2 3 4

1:100,000 1 inch equals 1.6 miles

Upper Valley Lake Sunapee
Regional Planning Commission

Map created by Upper Valley Lake Sunapee Regional Planning Commission, February 2008.

Data Sources:
Wildland-urban interface analysis by University of Wisconsin - Madison, SILVIS lab. Published as: Radeloff, V. C., R. B. Hammer, S. I Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKeefry. 2005. The Wildland Urban Interface in the United States. Ecological Applications 15:799-805.

Water features from NH Hydrography Dataset, 2006. Public Lands data distributed by NH GRANIT, 2007. Roads data from NH DOT, 2007.

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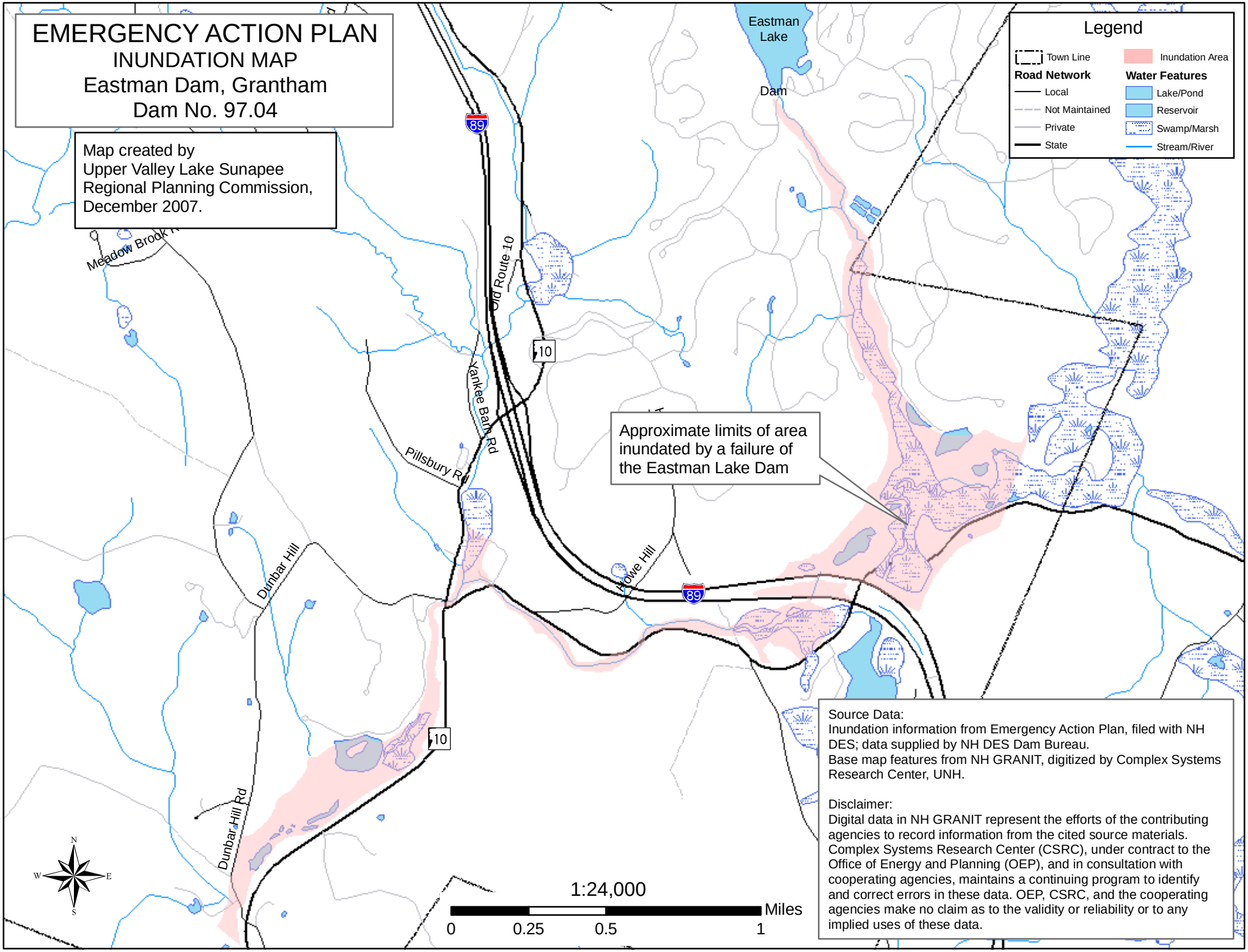
APPENDIX G

Map of Eastman Dam Inundation Area

EMERGENCY ACTION PLAN
INUNDATION MAP
Eastman Dam, Grantham
Dam No. 97.04

Map created by
Upper Valley Lake Sunapee
Regional Planning Commission,
December 2007.



Legend

- Town Line
- Inundation Area

Road Network
- Local
- Not Maintained
- Private
- State

Water Features
- Lake/Pond
- Reservoir
- Swamp/Marsh
- Stream/River

Source Data:
Inundation information from Emergency Action Plan, filed with NH DES; data supplied by NH DES Dam Bureau.
Base map features from NH GRANIT, digitized by Complex Systems Research Center, UNH.

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