THE TOWN OF HAMPDEN

LOCAL NATURAL HAZARDS MITIGATION PLAN

Adopted by the Hampden Board of Selectmen on June 16, 2008

Prepared by:

The Hampden Natural Hazards Mitigation Planning Committee

and

The Pioneer Valley Planning Commission
26 Central Street, Suite 34
West Springfield, MA 01089
(413) 781-6045
www.pvpc.org

This project was funded by a grant received from the Massachusetts Emergency Management Agency (MEMA) and the Massachusetts Department of Conservation Services (formerly the Department of Environmental Management)

ACKNOWLEDGEMENTS

The Hampden Board of Selectmen extends special thanks to the Hampden Natural Hazards Mitigation Planning Committee as follows:

John D. Flynn, Board of Selectmen
Kathleen Foster, Planning Board
Debbie House, Planning Board
Dana Pixley, Highway Department
Melissa Lail-Trecker, Grants Committee
Kevin Hinkamper

The Hampden Board of Selectmen offers thanks to the Massachusetts Emergency Management Agency (MEMA) for developing the Commonwealth of Massachusetts Natural Hazards Mitigation Plan (http://www.state.ma.us/dem/programs/mitigate/index.htm) which served as a model for this plan. In addition, special thanks are extended to the staff of the Pioneer Valley Planning Commission for professional services, process facilitation and preparation of this document.

The Pioneer Valley Planning Commission
Catherine Miller, Principal Planner/Co-Project Manager
Patty Gambarini, Environmental Planner
Todd Zukowski, Senior Planner/GIS Specialist
Jim Scace, GIS Specialist

TABLE OF CONTENTS

1 - INTRODUCTION

Hazard Mitigation

The Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA) define Hazard Mitigation as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, hurricanes, wildfires, earthquakes, etc. Mitigation efforts undertaken by communities will help to minimize damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural and historic resources.

Planning efforts, like the one undertaken by the Town of Hampden and the Pioneer Valley Planning Commission, make mitigation a proactive process. Pre-disaster planning emphasizes actions that can be taken before a natural disaster occurs. Future property damage and loss of life can be reduced or prevented by a mitigation program that addresses the unique geography, demography, economy, and land use of a community within the context of each of the specific potential natural hazards that may threaten a community.

Preparing a Local Natural Hazards Mitigation Plan before a disaster occurs can save the community money and will facilitate post-disaster funding. Costly repairs or replacement of buildings and infrastructure, as well as the high cost of providing emergency services and rescue/recovery operations, can be avoided or significantly lessened if a community implements the mitigation measures detailed in the Plan. FEMA requires that a community adopt a pre-disaster mitigation plan as a condition for mitigation funding. For example, the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program are programs with this requirement.

Planning Process

Planning for Hampden's natural hazard mitigation involved a six-member committee: John D. Flynn, Board of Selectmen; Kathleen Foster and Debbie House, Planning Board; Dana Pixley, Highway Department; Melissa Lail-Trecker, Grants Committee; and Kevin Hinkamper, an interested and active resident. The natural hazard mitigation planning process for the Town of Hampden included the following tasks:

- Reviewing and incorporating existing plans and other information (Appendix B lists documents consulted)
- Identifying the natural hazards that may impact the community.

- Conducting a Vulnerability/Risk Assessment to identify the infrastructure (*i.e.*, critical facilities, public buildings, roads, homes, businesses, etc.) at the highest risk for being damaged by the identified natural hazards, particularly flooding.

- Identifying and assessing the policies, programs, and regulations a community is currently implementing to protect against future disaster damages. Examples of such strategies include:

    - Preventing or limiting development in natural hazard areas like floodplains;
    - Implementing recommendations in existing planning documents including Master Plans, Open Space and Recreation Plans, and Emergency/Evacuation Plans that address the impacts of natural hazards; and
    - Requiring or encouraging the use of specific structural requirements for new buildings such as buried utilities, flood-proofed structures, and lightening grounding systems.

- Identifying deficiencies in the current strategies and establish goals for updating, revising or adopting new strategies.

- Adopting and implementing the final Local Natural Hazards Mitigation Plan.

During the planning process, the Town's Natural Hazard Planning Committee identified Action Plan items and specific time frames. The actions were selected from a list of local strategies which were compiled by the regional LEPC during several brainstorming sessions (see Regional Natural Hazard Mitigation Plan Risk Assessment Matrix – Section 3: Risk Assessment) and others identified by the Town during their review of existing programs, policies, and regulations. From this list, specific Action Items were prioritized by the Town's Local Natural Hazards Planning Committee based on the following criteria:

- Select Action Items which have the ability to significantly mitigate the negative impact of natural hazards on people and property;
- Select Action items which the Town has the ability to implement given the financial and staff resources available;
- Select Action Items which will have the greatest influence on achieving Local Goals & Objectives;
- Select a diverse set of Action Items which will address different Natural Hazards that present a high or moderate risk to the region; and
- Select Action items which will address those mitigation measures identified as deficient or in need of attention to ensure that the Town is in the best possible position to address natural hazards which impact property and residents.

The action items selected were all considered to have a low to moderate cost to implement. In some cases grant funding would be sought for implementation given the limited resources available in the Town.

The local action items represent a multi-faceted approach to addressing natural hazards in the Town and will be undertaken as resources become available and will be integrated into ongoing planning activities. As part of the review and adoption process, the Committee approved the action items that were in keeping with the goals and criteria established by the Town and assigned appropriate bodies within the Town to implement them within a five-year framework.

Public Committee Meetings

Public meetings of the planning committee were all held at the Hampden Town Offices on the dates listed below. Agendas for these meetings are included in Appendix B. The Town posted agendas for public notice in advance of the meetings held on: October 23, 2007, and November 13, 2007.

In addition, the draft plan was posted for public comment on the web (PVPC's website with a link from the Town of Hampden's website). PVPC publicized the availability of plans for public comment on the web through an article in the Sunday, September 23, 2007 issue of *The Republican*. (Appendix B)

An article about the plan and the committee's work appeared in The Wilbraham Hampden Times on March 29, 2007 (see Appendix B).

January 24, 2007, 7:00 pm: Informational and organizational meeting with Board of Selectmen and Planning Board, held at Hampden Town Offices.

February 16, 2007, 10:00-12:00 noon: Working committee meeting held at Town Offices.

February 27, 2007, 1:00-3:00 pm: Working committee meeting held at Town Offices.

March 21, 2007, 10:00-12:00 noon: Working committee meeting held at Town Offices.

April 5, 2007, 10:00-12:00 noon: Working committee meeting held at Town Offices.

April 25, 2007, 10:00-11:00 am: Working committee meeting held at Town Offices.

October 23, 2007, 9 a.m. – 10:30 p.m. Meeting to review and respond to FEMA comments held at Town Offices.

November 13, 2007, 1 p.m. – 3 p.m. Meeting to review and respond to FEMA comments held at Town Offices.

Prior to each meeting, a mailing was made to each committee member that contained information from the previous meeting, an agenda sheet, and information to be covered.

Public Meetings with the Board of Selectmen

On November 16, 2005, the Board of Selectmen agreed to begin the process of developing a Local Hazard Mitigation Plan. Meeting held at Hampden Town Offices.

Once the plan is provisionally approved by FEMA, the Board of Selectmen will hold a public hearing on the plan and then adopt the plan. Public notice (see Appendix B) involved a legal advertisement in the local paper 2 weeks in advance of the hearing.

The Board of Selectmen adopted the Local Natural Hazard Mitigation Plan at a meeting on June 16th, 2008 at Hampden Town Offices.

Involvement of neighboring communities

Neighboring communities have been notified of the opportunity to comment on the draft Hazard Mitigation Plan through an article in the Sunday, September 23, 2007 issue of *The Republican*, (See Appendix B), and through the Western Regional Homeland Security Advisory Council (WRHSAC), elected members of which are charged with sharing information about the work of the WRHSAC to their colleagues in the 101 communities of western MA.

Members of WRHSAC have been well informed of the Hazard Mitigation planning activities in Hampshire and Hampden counties from the outset. Many of the Council members—representatives of various emergency response and preparedness disciplines, including Police, Fire, DPW, Public Health, Emergency Response, Dispatch, Hospitals, and state and local government—were involved in mitigation planning for Berkshire and Franklin counties during 2003-2005, and informed during PVPC's application to get the contract for developing plans in Hampshire and Hampden counties. Since that time, PVPC has been collaborating with MEMA and representatives of the WRHSAC to obtain access to all of the region's 43 community's comprehensive emergency management plans (CEMP). In addition, a PVPC staff member who is working on the Mitigation plans for Hampshire and Hampden counties also staffs the WRHSAC. To promote even further regional review of the plans for Hampshire and Hampden county towns, PVPC officially met with the Western Regional Homeland Security Advisory Council on November 20, 2007.

2 – LOCAL PROFILE

Community Setting

Hampden is small town located in western Massachusetts, 10 miles east of Springfield and 30 miles northeast of Hartford, CT. Despite its location to these urban centers, this small town maintains its scenic, rural landscape and character. [1]

The town is located along the northern banks of the Scantic River, and comprises a total area of 19.65 square miles. It is bordered by East Longmeadow on the west, Wilbraham on the north, Monson on the east, and Somers and Stafford, Connecticut on the south. Hampden Village is nestled among a series of hills and mountains that rise to picturesque effect, including Mount Vision, Minnechaug Mountain, Pine Mountain, and Goat Rock, which affords scenic views into East Longmeadow and Somers, Connecticut.

Hampden is primarily a rural residential town. About 80% of its land is vacant, or in forest, agricultural use, or water bodies. The remaining 20% of the land in use is concentrated around the Town Center, or in a predominantly business area in the western part of the Town, or in the many subdivisions that are also scattered throughout the western section of the Town.

The eastern part of Hampden contains mountainous terrain with steep slopes and elevations above sea level from 450 to 850 feet. The greatest elevation is situated in southern Hampden, where Pine Mountain extends to 1070 feet. This mountainous topography is interrupted by the river valleys created by East Brook and the Scantic River. It is along the Scantic River that Hampden's Town Center is located. Goat Rock, a rock formation on the edge of the Wilbraham Mountains, stands as a guardian to the natural gateway to the valley that comprises Hampden Village. The gateway made possible the western route to Hampden, providing a link to the neighboring towns of East Longmeadow and Springfield to the west and Somers, Connecticut to the south. Without this natural route, trade and communication would have required a long and arduous journey over rough mountain terrain.

Moving westward towards East Longmeadow, the slopes become gentler and the land assumes a terracing effect until the land becomes quite swampy with many irregular low hills. The area known as Scantic Meadows, along the river, has many scenic views and some protected areas, but is experiencing a rapid rate of new development.

Buildings in Hampden Center date largely from the 1780s to the 1950s, although most were constructed during the middle decades of the nineteenth century when woolen mills flourished along the Scantic River. The first mill was constructed on the Scantic River in 1750, this was the beginning of a series of sawmills, grist mills, shingle mills, woolen mills, and dams that operated throughout the 18th and 19th centuries. Establishment of these mills along the Scantic created an extended street village from the town center, which today yields several modest mid-19th century examples of residences.

[1] The majority of this language has been adapted from Hampden's Open Space and Recreation Plan, adopted 2003.

In 1831, Hampden was still covered with "thatch". The Native Americans in the area used to burn the land every year to help in growing berries, and generally the land was more suited to dairy and orchards than farming. Additionally, in the late 1800's, there was a prominent timber and charcoal industry, which denuded the land of all trees.

There had been speculation that a railroad from Springfield to Providence through Hampden would be built in the late 1870's, but that failed to materialize. Without a railroad, the competition of larger mills in urban centers was a deterrent to quality production in Hampden. In the early 20th century, the lack of industry and easy forms of transportation that caused business to fail or leave the town made it increasingly attractive for tourism and as a summer residence. One of Hampden's more prominent summer residents was naturalist, conservationist and author Thornton Burgess (1874-1965). Some of Hampden's residents responded quickly to this new source of tourism income. The Hampden Hotel opened in 1902, and in 1911, the Steward Beebe house on North Road was converted into a hotel, the Maple Tree Inn. An observation deck and dance hall was built atop Pine Mountain, providing a view of the surrounding area.

Hampden has undergone various transitions throughout its history. Once a farming community, it became a mill town and then a sleepy community overlooked by the nearby cities. Now its proximity to Springfield and Hartford has drawn commuters, creating a bedroom community. A majority of the town's population commute to Springfield, Hartford and Worcester. The community has found that as people continue to move to the suburbs, Hampden has become an even more desirable place to live. Hampden has grown nearly 10% in population since 1990, to approximately 5,171 residents.

Infrastructure

Hampden's location and topography have been major factors in the development of the town. The town's relative lack of suitable farmland prevents the town from experiencing widespread development like many of its neighbors, especially now as farmland is easily transformed and developed into suburban housing tracks. In addition, Hampden's comparative inaccessibility from major population centers, has prevented it from being a commercial or industrial hub. The town has historically been able to enjoy seclusion and a slow rate of growth. As a community that places great value on the preservation of its rural character, this has helped to shape local land use patterns. [1]

Roads and Highways

There are no state highways in town, but the county and rural roads are in good condition. The nearest state highway is Route 83 in the neighboring town of East Longmeadow.

The principal roadway is Main Street, traveling east-west through town, and connecting to South Monson Road on the eastern side of town, and East Longmeadow Road on the western side of town. Other key routes include Wilbraham Road/Somers Road and Allen Street, traveling north-south through the western side of town; and Glendale Road/North Monson Road and Scantic

Road, traveling north-south through the western side of town. North Road also is used to travel north to Wilbraham, and South Road and Chapin Road are used to travel south into Connecticut.

Public Transportation

There is no public transportation service in Hampden, although the Pioneer Valley Regional Transit Authority offers paratransit (or van service) to seniors through MV Transportation and the Hampden Council on Aging.

Water and Sewer

There is no town-wide system of water distribution or sewer. The vast majority of residents rely on private, individual wells and independent septic systems. There are some "public" well sites where wells serve multiple users such as the school, employment centers, apartment complexes, etc. There is also one public well site serving approximately nine residences, and under the control of the Town's Water District.

Schools

The Town is part of the Hampden-Wilbraham Regional School District, with Thornton Burgess Middle School and Green Meadows Elementary School.

Natural Resources

The vast amount and variety of natural resources in Hampden make it a beautiful and desirable place to live. The Town's Open Space and Recreation Plan recognizes the value of these natural resources and uses detailed maps to pinpoint priority resources and make key recommendations for protection.

Water Resources

Hampden's plentiful water resources include primarily the Scantic River, as well as numerous streams, wetlands, and ponds. The abundance of water resources is also reflected in the reliable availability of groundwater for private and public wells. Hampden sits within Connecticut River watershed.

The Scantic River, Hampden's only significant river, enters Hampden at its southwestern corner and extends to the town's southern line, from where it follows a southwesterly course and eventually drains into the Connecticut River in East Windsor, Connecticut. Virtually all of Hampden's water-powered industry was located on the Scantic. The only other bodies of fresh water are a handful of small mill ponds. The Scantic and one of the mill ponds provide the only natural water recreation for its residents. It is possible to canoe or tube the Scantic during high water in the Spring. The river also provides fishing and swimming.

There are several tributaries flowing into the Scantic River, most notably Rockadundee Brook and Temple Brook in the southeastern corner of town; and East Brook and Big Brook flowing from the northeastern corner. The Watchaug Brook and the South Branch of the Mill River can be found on the western side of town. The entire western border of Hampden with East Longmeadow has more low-lying topography, creating wider floodplains.

In addition to the Scantic River and the above-mentioned brooks, there are numerous smaller brooks, as well as ponds and impoundments throughout the town. These water bodies are a valuable community resource that contributes greatly to the scenic and rural character of the town. Goodwill Pond, at the confluence of East Brook and one of its smaller tributaries is such an example. Many of the ponds are natural, but some are old farm ponds built during the WPA period and are used for irrigation, water supply, fire protection, and recreation.

In addition to water supply, these water resources, especially wetlands, are important for water quality and wildlife habitat. Along with recreation, they provide viable habitat, nesting, food, and water for a variety of species. Wetlands also provide filtration of all pollutants that enter them, hence cleaning the water on which all species depend. Hampden has many areas where the water table is at or near the land surface and as a result, the land characteristics range from seasonally wet or flooded to deep marsh or open water.

In Hampden, 117 acres can be classified as a wetland type. Whereas approximately 18 acres of the 117 total wetland acres is open water, approximately 99 acres is shallow freshwater wetlands. These wet areas are chiefly located in the lowland section (western part) or Hampden; however, some wet areas do exist in upland sections along streams and brooks.

Wetlands not associated with brooks or rivers are called “isolated wetlands.” Vernal pools are examples of these and fill with water only during the wet seasons, providing habitat for salamanders, frogs, and other threatened species.

Vegetation

Hampden's vegetative cover is as diverse as its topography and adds to the Town's scenic and rural character. Its forests and fields provide aesthetic, economic and recreational benefits. Wetlands and abandoned fields also add important habitat elements for a diverse wildlife population.

Hampden boasts a significant amount of undeveloped acreage and forest in its landscape. Approximately 7,918 acres, or 63% of Hampden is forested. Hampden is within the general central hardwoods-hemlock-white pine forest type which also includes white and red oak, white pine, hemlock, poplar, aspen, red and sugar maple, white ash, shagbark and pignut hickory, and white, silver and gray birch. At present much of the Town is forested; the most heavily forested areas are located in the Minnechaug and Wilbraham Mountain complex and the upland area in the eastern section of Town.

Development

Development Patterns

Several factors have played, and will continue to play, an important role in the development of Hampden. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, poor soil conditions, land set aside for conservation, the Scantic River, its tributaries and floodplains; and the feasibility of private wells and independent septic. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Zoning and other land use regulations constitute a town's "blueprint" for its future. Land use patterns over time will continue to look more and more like the town's zoning map until the town is finally "built out"—that is, there is no more developable land left. Therefore, in looking forward over time, it is critical that the town focus not on the current use and physical build-out today, but on the potential future uses and build-out that are allowed under the town's zoning map and zoning bylaws. Zoning is the primary land use tool that the town may use to manage development and direct growth to suitable and desired areas while also protecting critical resources and ensuring that development is in keeping with the town's character.

In its current zoning, Hampden has nine base zoning districts and two overlay districts. The base districts define the allowed uses and dimensional requirements in all parts of the town, while the overlay districts provide for additional restrictions in certain areas. These districts are described below.

Residential District R-6: Areas of town which are best suited for low to medium-density residential single-family development as well as non-commercial land uses and activities in keeping with the Town's rural character.

Residential District R-4: Areas of town which are best suited for the same uses as R-6; but also allowing elderly persons and group housing.

Multi-Unit Dwelling District (MD): Areas of town which are best suited for the same uses are R-4, but also allowing garden-type apartments and other multi-unit dwellings.

Business District (B): Areas of town which are best suited for consumer goods and services uses.

Commercial District (C): Ares of town which are best suited for goods and services uses for transients or tourists, and non-consumer goods and services uses.

Light Industrial District (LI): Areas of town which are best suited for use by research laboratories, office buildings and light industries which are compatible with a low density, rural residential community uses.

Floodplain/Wetland District (FP/W): This is an overlay district, designated for areas within the floodway of the Scantic River and its tributaries and well as other areas of town within the 100-year floodplain and/or covered by wetlands. No new development is allowed in either district without special permit. These districts establish additional regulations to prevent flooding and manage stormwater and water quality.

Golf Recreational District (GR): Areas of town intended for a commercial golf course and the normal and usual accessory uses.

Non-Profit Educational and Recreation District (N-PER): Areas of town intended to permit the study of natural history including examination and preservation of plant and wildlife species, and for related non-profit recreational activities.

Water Supply Protection Overlay District (WSP): This overlay district sets forth standards, rules and permitting procedure for uses that are located within the town's groundwater source recharge areas.

Ridgeline and Hillside Protective Overlay District: This overlay district is currently under revision; it sets forth standards, rules, and permitting procedure for uses that are located in sensitive mountains or steep slope areas of scenic and natural resource value.

The Zoning Bylaw establishes a Site Plan Approval procedure for most business, industrial, and commercial buildings within the Town. Site Plan Review allows the Planning Board the ability to review the development proposal to ensure that the basic safety and welfare of the people of Hampden are protected. The town has also adopted a Stormwater Management bylaw which also places limits on development in order to manage stormwater run-off.

Current Development Trends

Today, this small community is home to approximately 5,171 residents. The majority of Hampden's 12,569 acres is undeveloped land, totaling nearly 9,140 acres. Residential land totaling 2,162 acres and agricultural land totaling 943 acres account for the majority of the remaining Town area. Commercial and industrially used land consists of approximately 87 acres, with pubic/urban open and recreational land contributing an additional 255 acres.

Currently, development in Hampden is somewhat encouraged by existing zoning to seek areas where the environmental conditions support such development. While the town's existing zoning regulations permit medium to high-density suburban development throughout much of its current open land, limitations include:

- zoning limits on development in areas preserved for conservation, or in flood hazard areas;
- reliance on individual wells and independent septic systems so that development can only occur where on-site private well and septic treatment are feasible.

Development in Hazard Areas

Hazards identified in this plan are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. According to the Community Information System (CIS) of FEMA, there were 200 structures located within the Special Flood Hazard Area (SFHA) in Hampden as of June 2005, the most current records in the CIS for the Town of Hampden. For the high hazard dams, inundation zones are mapped as part of the Emergency Action Plans required of dam owners by the Commonwealth of Massachusetts. To date, an analysis of development trends in these inundation zones has not been conducted.

3 – HAZARD IDENTIFICATION & ANALYSIS

Natural Hazard Identification

Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to identify the natural hazards which are most likely to have an impact on the Town of Hampden. These hazards are: floods, severe snowstorms/ice storms, hurricanes/severe winds, tornadoes/microbursts, wildland fires/brushfires, earthquakes, dam failure, drought, man-made hazards-hazardous materials.

Floods

The average annual precipitation for Hampden and surrounding areas in northwestern Massachusetts is 46 inches. There are three major types of storms that bring precipitation to Hampden. Continental storms that originate from the west continually move across the region. These storms are typically low-pressure systems that may be slow-moving frontal systems or more intense, fast-moving storms. Precipitation from coastal storms, also known as nor'easters, that travel into New England from the south constitute the second major storm type. In the late summer or early fall, the most severe type of these coastal storms, hurricanes, may reach Massachusetts and result in significant amounts of rainfall. The third type of storm is the result of local convective action. Thunderstorms that form on warm, humid summer days can cause locally significant rainfall.

Floods can be classified as either *flash floods*, which are the product of heavy, localized precipitation in a short time period over a given location or *general floods*, which are caused by precipitation over a longer time period in a particular river basin. There are several local factors that determine the severity of a flooding event, including: stream and river basin topography, precipitation and weather patterns, recent soil moisture conditions, amount of impervious surface area, and the degree of vegetative clearing. Furthermore, flooding can be influenced by larger, global climate events. Global warming and climate change have the potential to shift current rainfall and storm patterns. Increased precipitation is a realistic result of global warming, and could potentially increase the frequency and intensity of flooding in the region. Currently, floods occur and are one of the most frequent and costly natural hazards in the United States.

Flash flooding events typically occur within minutes or hours after a period of heavy precipitation, after a dam or levee failure, or from a sudden release of water from an ice jam. Most often, flash flooding is the result of a slow-moving thunderstorm or the heavy rains from a hurricane. In rural areas, flash flooding often occurs when small streams spill over their banks. However, in urbanized areas, flash flooding is often the result of clogged storm drains (leaves and other debris) and the higher amount of impervious surface area (roadways, parking lots, roof tops).

In contrast, *general flooding* events may last for several days. Excessive precipitation within a watershed of a stream or river can result in flooding particularly when development in the floodplain has obstructed the natural flow of the water and/or decreased the natural ability of the

groundcover to absorb and retain surface water runoff (*e.g.*, the loss of wetlands and the higher amounts of impervious surface area in urban areas).

A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large "sponges" to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into fertile, productive farmland like that found in the Connecticut River valley. In the past, floodplain areas were also often seen as prime locations for development. Industries were located on the banks of rivers for access to hydropower. Residential and commercial development occurred in floodplains because of their scenic qualities and proximity to the water. Although periodic flooding of a floodplain area is a natural occurrence, past and current development and alteration of these areas will result in flooding that is a costly and frequent hazard.

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. For the most part, Hampden's floodplains are narrow corridors that follow very closely the paths of rivers and brooks. These are highly susceptible to flooding at any time of the year when heavy storms can dramatically increase stream levels within a short period. The floodplains of the Scantic River, Watchaug Brook, Big Brook, and East Brook are the areas most prone to flooding. Most of the smaller streams feed into the Scantic River and thus it can experience the heaviest flooding and cause the most damage during prolonged rainfall. The areas along Watchaug Brook, in the northwestern corner of town, are also cause for concern as they are low-lying. In addition to damage of buildings directly in the floodplain, development can result in a loss of natural flood storage capacity and can increase the water level of the lakes. Flood levels may then increase, causing damage to structures not normally in the flood path.

Hampden has experienced many flooding events over the last decade. Generally, these small floods have had minor consequence, with only temporary impacts to roads and residents' yards. In October of 2005, a period of extended rainfall (a week with 12 inches of rain followed by a storm event in which 5-7 inches of rain fell in one evening) caused the Scantic River and its tributaries to overflow their banks, causing severe town-wide flooding with significant damage. Flooding was extensive along Main Street, where five households had to be evacuated, and along Rock-a-Dundee Road, Ames Road, and Howlett Hill Road among several others. Flooding also washed away the VFW Footbridge.

Severe Snowstorms/Ice Storms

Three types of winter events are heavy snow, ice storms, and extreme cold which cause concern. Heavy snow and ice storms have disrupted power and communication services. At the same time, these events cause trees to fall and they cause damage homes and close roads.

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10 inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses

population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

NESIS scores are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the path of the storm. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which varies from around one for smaller storms to over ten for extreme storms. The raw score is then converted into one of the five NESIS categories. The largest NESIS values result from storms producing heavy snowfall over large areas that include major metropolitan centers.

Severe winter storms can pose a significant risk to property and human life because the rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can disrupt utility service, phone service and make roadways extremely hazardous. Severe winter storms can be deceptive killers. The types of deaths that can occur as a result of a severe winter storm include: traffic accidents on icy or snow-covered roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to cold temperatures. Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt. Power and telephone lines, trees, and telecommunications structures can be damaged by ice, wind, snow, and falling trees and tree limbs. Icy road conditions or roads blocked by fallen trees may make it difficult to respond promptly to medical emergencies or fires. Prolonged, extremely cold temperatures can also cause inadequately insulated potable water lines and fire sprinkler pipes to rupture and disrupt the delivery of drinking water and cause extensive property damage.

New England generally experiences at least one or two severe winter storms each year with varying degrees of severity. Research on climate change indicates that there is great potential for stronger, more frequent storms as the global temperature increases. Severe winter storms typically occur during January and February; however, they can occur from late September through late April.

Hurricanes/Severe Wind

Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour, and large amounts of precipitation. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground utilities.

The intensity of a hurricane is measured using a 1-5 rating called the Saffir-Simpson Hurricane Scale. According to NOAA's National Hurricane Center, Saffir-Simpson "…is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall. Wind speed is the determining factor in the scale…"

The 5 categories are:

Category 1—winds at 74-95 mph, with storm surge generally 4-5 feet above normal;
Category 2 —winds at 96-110 mph, with storm surge generally 6-8 feet above normal;
Category 3—winds at 111-130 mph, with storm surge generally 9-12 feet above normal;
Category 4—winds at 131-155 mph, with storm surge generally 13-18 feet above normal;

> Category 5—winds greater than 155 mph, with storm surge generally greater than 18 feet above normal.

In Massachusetts, major hurricanes occurred in 1904, 1938 (Category 3), and 1954 (Category 3). Other hurricanes with major impacts include those in 1955, 1960 and 1976. Global warming will increase the threat of hurricanes as oceans and atmosphere warms. Climate change research indicates that storms like hurricanes will become more intense and more frequent in the future.

Tornadoes/Microbursts

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along a path that ranges from a few dozen yards to over a mile in width. The path of a tornado may be hard to predict because they can stall or change direction abruptly.

For more than three decades, the method for evaluating the severity of a tornado involved relating the degree of damage to the intensity of the wind, using the Fujita Scale, known as the F-scale (1 through 6 with 6 being the most severe). This generalized method has been problematic, according to information from NOAA's Storm Prediction Center, as different winds may be needed to cause the same damage depending on how well-built a structure is, wind direction, wind duration, battering by flying debris, and a bunch of other factors. The process of rating the damage itself is largely a judgment call, according to NOAA's Storm Prediction Center. Even meteorologists and engineers highly experienced in damage survey techniques often came up with different F-scale ratings for the same damage.

As of February 2007, an enhanced F-Scale should be used. NOAA's Storm Prediction Center reports,

> The Enhanced F-scale is a much more precise and robust way to assess tornado damage. It classifies F0-F5 damage as calibrated by engineers and meteorologists across 28 different types of damage indicators (mainly various kinds of buildings, but also a few other structures as well as trees). The idea is that a "one size fits all" approach just doesn't work in rating tornado damage, and that a tornado scale needs to take into account the typical strengths and weaknesses of different types of construction….In the Enhanced F-scale, there will be different, customized standards for assigning any given F rating to a well built, well anchored wood-frame house compared to a garage, school, skyscraper, unanchored house, barn, factory, utility pole or other type of structure. In a real-life tornado track, these ratings can be mapped together more smoothly to make a damage analysis. Of course, there still will be gaps and weaknesses on a track where there was little or nothing to damage, but such problems will be less common than under the original F-scale. As with the original F-scale, the enhanced version will rate the tornado as a whole based on most intense damage within the path. *There are no plans to systematically re-evaluate historical tornadoes using the Enhanced F-scale.*

Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester, including towns in Hampden County.

Of additional concern are microbursts, which often do tornado-like damage and can be mistaken for tornadoes. In contrast to the upward rush of air in a tornado, air blasts rapidly downward from thunderstorms to create microbursts.[2] Microbursts and tornadoes are not uncommon in the region, and they are expected to become more frequent and more violent as the earth's atmosphere warms, due to predictions of climate change from global warming. One known tornado has touched down in Hampden, and there have been several high-wind storms and hail events. In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath directly over Hampden, known as "tornado alley."

Wildland Fires/Brushfires

Wildland fires are typically larger fires, involving full-sized trees as well as meadows and scrublands. Brushfires are uncontrolled fires that occur in meadows and scrublands, but do not involve full-sized trees. Both wildland fires and brushfires can consume homes, other buildings and/or agricultural resources. Typical causes of brushfires and wildfires are lightning strikes, human carelessness, and arson.

According to FEMA, there are three different classes of wildland fires: *surface fires*, *ground fires* and *crown fires*.[3] The most common type of wildland fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is usually started by lightening. Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions. While wildland fires have not been a significant problem in Hampden, there is always a possibility that changing land use patterns and weather conditions will increase a community's vulnerability. For example, drought conditions can make forests and other open, vegetated areas more vulnerable to ignition. Once the fire starts, it will burn hotter and be harder to extinguish. Soils and root systems starved for moisture are also vulnerable to fire. Residential growth in rural, forested areas increases the total area that is vulnerable to fire and places homes and neighborhoods closer to areas where wildfires are more likely to occur. Global climate changes may also influence precipitation patterns, making the region more susceptible to drought and therefore, wildfires.

Brushfires are more common in Town than wildfires. According to the Hampden Fire Department, there are approximately 12 unauthorized burns (or brushfires) per year, on average. As a point of comparison, approximately 1,000 burn permits are issued annually.

Earthquakes

An earthquake is a sudden, rapid shaking of the ground that is caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly, without warning, at any time of the year. The magnitude of an earthquake is measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations

[2] *http://www.fema.gov/regions/vii/2003/03r7n06a.shtm*
[3] FEMA, "Fact Sheet: Wildland Fires," September 1993.

recorded on the seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) increases the energy more than 30 times.

The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII, with I denoting a weak earthquake and XII denoting a earthquake that causes almost complete destruction.

Nineteen earthquakes, of an intensity of V or greater on the Modified Mercalli scale, have centered in Massachusetts since it was colonized by Europeans. An earthquake of an intensity of V is felt by nearly everyone; many folks are awakened. Some dishes and windows are broken. Unstable objects are overturned, and clocks may stop. A shock in 1755 reached intensity VIII at Boston and was felt across the state. In addition, Massachusetts was affected by some of the more severe Canadian shocks plus the earthquake of 1929 that centered on Grand Banks of Newfoundland.

Strong earthquakes in the St. Lawrence Valley in 1638, 1661, 1663, and 1732 were felt in Massachusetts. The 1638 and 1663 shocks damaged chimneys at Plymouth, Salem, and Lynn. On June 11, 1643, Newbury, Massachusetts, was strongly shaken. Again in 1727 (November 9) an earthquake described as "tremendous" in one report and "violent" in another caused much damage at Newbury. The shock was felt from the Kennebec River to the Delaware River and from ships at sea to the extreme western settlements. Several strong aftershocks were reported from the area through February 1728.

Today, New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.[4] Ground shaking from earthquakes can rupture gas mains and disrupt other utility service, damage buildings, bridges and roads, and trigger other hazardous events such as avalanches, flash floods (dam failure) and fires. Un-reinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated, unstable soil, and mobile homes not tied to their foundations are at risk during an earthquake.[5]

[4] Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm.*
[5] Federal Emergency Management Agency Web site: *www.fema.gov/hazards/earthquakes/quake.shtm.*

Table 3-1: New England Earthquakes with a Magnitude of 4.2 or more 1924 – 2002

LOCATION	DATE	MAGNITUDE
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Plattsburg, NY	April 20, 2002	5.1

Source: Northeast States Emergency Consortium Web site:
www.nesec.org/hazards/earthquakes.cfm

Table 3-2: New England States Record of Historic Earthquakes

STATE	YEARS OF RECORD	NUMBER OF EARTHQUAKES
Connecticut	1568 - 1989	137
Maine	1766 - 1989	391
Massachusetts	1627 - 1989	316
New Hampshire	1728 - 1989	270
Rhode Island	1766 - 1989	32
Vermont	1843 - 1989	69
New York	1737 - 1985	24
Total Number of Earthquakes within the New England states between 1568 and 1989 = 1,239.		

Source: Northeast States Emergency Consortium Web site:
www.nesec.org/hazards/earthquakes.cfm

Massachusetts introduced earthquake design requirements into their building code in 1975. However, these specifications apply only to new buildings or to extensively modified existing buildings. Buildings, bridges, water supply lines, electrical power lines and facilities built before 1975 may not have been designed to withstand the forces of an earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

Dam Failure

Although dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control, they also pose a potential risk to lives and property. Dam failure is not a common occurrence but dams do represent a potentially disastrous hazard. When a dam fails, the potential energy of the stored water behind the dam is released. Most earthen dam failures occur when floodwaters above overtop and erode the material components of the dam. Often dam breaches lead to catastrophic consequences as the water ultimately rushes in a torrent downstream flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built in the 19th century without the benefit of modern engineering design and construction oversight. Dams can fail because of structural problems due to age and/or lack of proper maintenance. Dam failure can also be the result of structural damage caused by an earthquake or flooding brought on by severe storm events.

The Massachusetts Department of Conservation and Recreation (MA DCR) was the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). Until 2002, DCR was also responsible for conducting dam inspections but then state law was changed to place the responsibility and cost for inspections on the owners of the dams. This means that individual dam owners are now responsible for conducting inspections. Notice for dam owners to comply with the inspection schedule did not go out until 2006. Extensions were provided to some dam owners, particularly to towns, so that they could include the costs of inspection within their funding cycles.[*]

The state has three hazard classifications for dams:

- *High Hazard*: Dams located where failure or improper operation will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.
- *Significant Hazard*: Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important facilities.
- *Low Hazard*: Dams located where failure or improper operation may cause minimal property damage to others. Loss of life is not expected.

The inspection schedule for dams is as follows:

- Low Hazard dams – 10 years
- Significant Hazard dams – 5 years
- High Hazard dams – 2 years

[*] Alice Bilbo-Miles , legal advisor to the Massachusetts Office of Dam Safety.

The time intervals represent the maximum time between inspections. More frequent inspections may be performed at the discretion of the state. Dams and reservoirs licensed and subject to inspection by the Federal Energy Regulatory Commission (FERC) are excluded from the provisions of the state regulations provided that all FERC-approved periodic inspection reports are provided to the DCR. All other dams are subject to the regulations unless exempted in writing by DCR.

According to information from DCR's Office of Dam Safety, which has been supplemented with local knowledge, there are currently eleven (11) dams in Hampden. Of these dams, nine (9) are deemed by DCR to be non-jurisdictional (the storage capacity of the impoundment and height of dam are such that they need not be regulated). In its risk ratings, DCR appears to have recently upgraded the Driscoll Dam from Low to Significant, and downgraded the Gleason Pond Dam from Significant to Non Jurisdictional. The Director of the Hampden Highway Department has noted that the Driscoll Dam is a small impoundment with a depth of only about one foot, and no homes in the inundation zone below. Should the dam fail, he noted, Summers Road may be temporarily flooded due to the limitations of the culvert, but that the water would all eventually flow into the adjoining wetlands. Also, a large section on the north/west side of the Labonte Pond Dam failed in 1955, causing severe flooding, but no loss of life. Today, the abutments and about 60% of the actual dam are still standing, and large stones are still in the area, just down stream.

The following table identifies dams within the town, state id, name of owner, purpose, condition, last inspected date, and hazard risk classification.

Table 3-3: Hampden Dams, Classified by Hazard Risk

Dam name/ date built	ID	Owner	Purpose	Condition/last inspected	Hazard Risk
Driscoll Pond Dam	MA01904	Satyendra Giri		No information available	~~Low~~ Significant
Rockwell Pond Dam/1900	MA00534	The Rockwells	Recreation	No condition indicated/ July 2000	Low
Gleason Pond Dam (NJ)/1918	MA01899	Elaine McGrath	Farm Pond	Satisfactory/ No date indicated	~~Significant~~ Non Jurisdictional*
Wentworth Farm Pond Dam/1968	MA00535	Steven Haldeman, Lee Zepke	Recreation		~~Low~~ Non Jurisdictional*
George Ingle Pond Dam	MA01901	George Ingle			~~Low~~ Non jurisdictional*
Marion Pond Dam	MA01906	Paul L. Marion			~~Low~~ Non Jurisdictional*
Sazama Pond Dam	MA02688	James Sazama			~~Low~~ Non Jurisdictional*
Stalker Pond Dam	MA02689	Town of Hampden			~~Low~~ Non

					Jurisdictional*
Worthington Pond Dam	MA01902	Efrem A. Gordon			Non Jurisdictional*
Labonte Pond Dam	MA 02690	Walter L. Black		January 1969	Non Jurisdictional*
Chaffin Pond Dam	MA01905	Peter Nossal			Non Jurisdictional*

Source: Massachusetts Department of Conservation and Recreation (DCR), Office of Dam Safety, February 2007, supplemented with local knowledge of committee members.
* Jurisdictional determinations made by DCR based on storage capacity of impoundment and height of dam.

Drought

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector.[7]

In Massachusetts, six major droughts have occurred statewide since 1930[6]. They range in severity and length, from three to eight years. In many of these droughts, water-supply systems were found to be inadequate. Water was piped in to urban areas, and water-supply systems were modified to permit withdrawals at lower water levels.

Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of the direct impacts of drought. Of course, these impacts can have far-reaching effects throughout the region and even the country.

When evaluating the region's risk for drought on a national level, utilizing a measure called the Palmer Drought Severity Index, Massachusetts is historically in the lowest percentile for severity and risk of drought.[7] However, global warming and climate change may have an effect on drought risk in the region. With the projected temperature increases, some scientists think that the global hydrological cycle will also intensify. This would cause, among other effects, the potential for more severe, longer-lasting droughts.

Man-Made Hazards – Hazardous Materials

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health. These chemicals come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes and businesses routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

[6] US Geological Survey Water-Supply Paper 2375. "National Water Summary 1989 – Floods and Droughts: Massachusetts." Prepared by S. William Wandle, Jr., US Geological Survey.
[7] National Drought Mitigation Center – http://drought.unl.edu

The Toxics Release Inventory (TRI), a publicly available EPA database that contains information on specific toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities.[8] According to TRI, there are no industries currently releasing hazardous materials within Hampden's town limits. However, there are two Tier II Hazardous Materials storage facilities in Hampden, they are included on the Past & Potential Hazards/Critical Facilities Map (Appendix D).

However, varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores. These hazardous materials are transported regularly over our highways and by rail and if released can spread quickly to any community. Incidents can occur at any time without warning. Human error is the probable cause of most transportation incidents and associated consequences involving the release of hazardous materials.

[8] 2004 Toxic Releases Inventory (TRI) Data Files for Massachusetts. www.epa.gov/tri/

Vulnerability Assessment

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Hampden. The Past and Potential Hazards/Critical Facilities Map (Appendix D) reflects the contents of this list.

In order to determine estimated losses due to natural and man made hazards in Hampden, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The value of all structures in the Town of Hampden, including exempt structures such as schools and churches, is $541,483,705 as of 2006[9]. The median value of a home in Hampden in 2006 is approximately $247,950[9]. The data below was calculated using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses, August 2001. In addition, the Committee completed the Vulnerability Assessment Worksheets which provided more data to estimate the potential losses.

Past and Potential Hazards

Flooding (100-year base flood): Medium-High Risk

In this section, a vulnerability assessment was prepared to evaluate the potential impact that flooding could have on the portions of Hampden located within the 100-year floodplain. Flooding was chosen for this evaluation because it is a natural hazard likely to impact the community and the location of the impact can be determined by mapping of areas inundated during severe flooding events. Flooding can be caused by severe storms, such as hurricanes, nor'easters, and microbursts, as well as ice dams and snow melt.

There are approximately 716 acres of land within the FEMA mapped 100-year floodplain and 597 acres of land within the 500-year floodplain within the Town of Hampden. According to the Community Information System (CIS) of FEMA, there were 200 structures (all residential) located within the Special Flood Hazard Area (SFHA) in Hampden as of June 9, 2005, the most current records in the CIS for the Town of Hampden. Utilizing the Town's median home value of $247,950, a preliminary damage assessment was generated. For the estimated number of people living in the floodplain, an average household size of 2.4[10] people was used.

A total of 200 residential structures are located within the SFHA in Hampden, totals approximately $49.59 million of damage, and 480 people impacted. The damage estimate is a rough estimate and likely reflects a worst-case scenario. Computing more detailed damage assessments based on assessor's records is a labor-intensive task and beyond the scope of this project.

[9] Figure courtesy of The Warren Group – Real Estate Information; accessed 1/12/2007.
[10] Figure courtesy of 2000 U.S. Census and represents calculated estimate of the number of people living in a household divided by the total number of households in Hampden County.

River Park Drive

The end of River Park Drive was built into the 100-year floodplain. During heavy rain events, this entire end of the road tends to experience flooding. Although there are no critical facilities in this problem spot, during recent flooding, residents needed to be rescued from this area. There are approximately 9 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $2,231,550. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Mohawk Drive

The end of Mohawk Drive was built into the 100-year floodplain. During heavy rain events, this entire end of the road tends to experience flooding. Although there are no critical facilities in this problem spot, during recent flooding, residents needed to be rescued from this area. There are approximately 3 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $743,850. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Colony Drive

The end of Colony Drive is located close to the 500-year floodplain, near Mill Pond. This neighborhood tends to see some flooding during heavy rains. Although there are no critical facilities in this neighborhood, there are approximately 6 residential structures that could be impacted by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $1,487,700. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Flooding: High Risk

In addition to the floodplains mapped by FEMA for the 100-year and 500-year flood, Hampden often experiences minor flooding at isolated locations due to drainage problems, or problem culverts. Most of the flood hazard areas listed here were identified due to known past occurrence in the respective area. There are many areas with no record of previous flood incidents that could be affected in the future by heavy rain and runoff. Additionally, the vast majority of culverts throughout town tend to be impacted by beavers, so localized flooding can potentially occur at any culvert crossing.

To determine the vulnerability of the Town to localized flood events, the property within identified areas was visually analyzed using aerial photography (Pictometry), which allowed structures to be identified and tallied. Then, utilizing the Town's median home value of $247,950, a preliminary damage assessment was then generated. For the estimated number of people living in the floodplain, an average household size of 2.4[10] people was used. These damage estimates are rough estimates and likely reflect a worst-case scenario. Computing more detailed damage assessments based on assessor's records is a labor-intensive task and beyond the scope of this project.

Glendale Road

A culvert repeatedly floods where East Brook travels under Glendale Road, near Goodwill Pond. There are no critical facilities located near this trouble spot, but Glendale Road leads north to Ames Road and North Monson Road, and serves as an evacuation route. In addition, there are approximately 3 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $743,850. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included. There is also potential for the road to be damaged.

Main Street – Near Scantic Road/Glendale Road Split

Just before the confluence of East Brook into the Scantic River, the brook travels under Main Street. An undersized culvert at this location tends to flood during heavy storm events. There are no critical facilities at this location, but it is major intersection for the Town. Not only is it located on Main Street, a key evacuation route, it is near the split with Glendale Road (a northward evacuation route) and Scantic Road (a southward evacuation route). In addition, the flooding tends to impact access to several nearby critical facilities, including the Town House (the primary EOC), Fire Department, and Police Department. Furthermore, this culvert tends to flood during the same conditions as the other problem culvert on Main Street, thereby cutting off these critical facilities from the rest of Town. There are approximately 8 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $1,983,600. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included. There is also potential for the road to be damaged.

Main Street – At Memorial Park Road

A culvert repeatedly floods where West Brook travels under Main Street, just west of Memorial Park Road. There are no critical facilities located near this trouble spot, but Main Street is a key evacuation route. In addition, the flooding tends to impact access to several nearby critical facilities, including the Highway Department, Town House (the primary EOC), Fire Department, and Police Department. Furthermore, this culvert tends to flood during the same conditions as the other problem culvert on Main Street, thereby cutting off these critical facilities from the rest of Town. There are approximately 3 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $743,850. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included. There is also potential for the road to be damaged.

River Park Drive

The end of River Park Drive was built into the 100-year floodplain. During heavy rain events, this entire end of the road tends to experience flooding. Although there are no critical facilities in this problem spot, during recent flooding, residents needed to be rescued from this area. There are approximately 9 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $2,231,550. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Mohawk Drive

The end of Mohawk Drive was built into the 100-year floodplain. During heavy rain events, this entire end of the road tends to experience flooding. Although there are no critical facilities in this problem spot, during recent flooding, residents needed to be rescued from this area. There are approximately 3 residential structures in this area that have been affected or could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $743,850. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Severe Snowstorms/Ice Storms: High Risk

While Hampden's recent history has not recorded any loss of life due to these extreme winter weather events, the town has been subject to 22 winter storms categorized as major to extreme according to the NESIS scale since 1960. Additional historically significant winter storms to affect Hampden include the Great Snow of 1717 and the Blizzard of 1888. More recently, the Town has received FEMA assistance for the following snowstorms: Josh in March 1993 (18 inches); Ginger in January 1996 (24 inches); President's Day snow storm in February 2003; and snow storms in December 2003, and January 2005.

- Moderate risk town wide due to snow, ice, and extreme cold.
- Heavy snow years can cause accumulations of several feet.
- Hampden's mountainous terrain creates some very steep grades, making plowing difficult and causing snow and ice hazards.
- Many of the farms and open meadows and fields throughout town cause snow drifts.

Forest Hills Road and Valley View Drive

Any severe winter weather incident can cause critical snow and ice hazards at several points along Forest Hills Road and Valley View Drive in the northern portion of Town. This is due to significant grade and a hairpin turn, causing driving difficulties and impairing visibility.

Pondview Drive

Any severe winter weather incident can cause critical snow and ice hazards at several points along Pondview Drive in the northern portion of Town. This is due to significant grade and a dangerous turns, causing driving difficulties and impairing visibility.

Mountain Road

Steep grades along several sections of Mountain Road in the northern part of Town can be severely impacted by winter weather, making travel treacherous. In addition, the roads are so narrow, there is little room to push accumulated snow.

North Road

One section of steep grade along North Road in the northern part of Town can be severely impacted by winter weather, making travel treacherous. In addition, stone retaining walls along the side of the road leave no room to push accumulated snow. Although there are no critical facilities along North Road, it serves as a key evacuation route north to Wilbraham.

Ames Road

Severe winter weather can cause snow and ice hazards at the bend in Ames Road just after it splits off of Glendale Road, making travel treacherous. Ames Road serves as an evacuation route to the north.

Hurricanes/Severe Wind: Medium-Low Risk

Hampden's location in Western Massachusetts reduces the risk of extremely high winds that are associated with hurricanes, although it can experience some high wind events. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. Hurricanes can and do create flooding. Estimated wind damage 5% of the structures with 10% damage $2,707,419. Estimated flood damage 10% of the structures with 20% damage $10,829,674. This potential cost estimate would total $13,537,093, for a hurricane event. Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

- Hurricanes in 1938, 1954 (Carol), and 1991 (Bob) were major events in Western Massachusetts with wind damage and flooding;
- The Town has also been affected to a lesser degree by other hurricanes (The Great Atlantic Hurricane in 1944, Donna in 1960, and Gloria in 1985, remnants of Hurricane Floyd in 1999, and other storms with high winds (Groundhog Day Gale in 1976);
- Power and phone lines - disruptions of services;
- Structural damage potential;
- Flooding/washing of evacuation routes.

Major Hurricanes and Hampden Area

Hurricane/Storm Name	Year	Saffir/Simpson Category (when reached MA)
Great Hurricane of 1938	1938	3
Great Atlantic Hurricane	1944	1
Carol	1954	3
Edna	1954	1
Diane	1955	Tropical Storm
Donna	1960	Unclear, 1 or 2
Groundhog Day Gale	1976	Not Applicable
Gloria	1985	1
Bob	1991	2
Floyd	1999	Tropical Storm

Pine Mountain, Mount Vision, Minnechaug Mountain, and Goat Rock

The higher elevations near the tops of the mountains throughout town are more susceptible to severe wind incidents, especially during severe thunderstorms, hurricanes, or blizzards. However, no damages have been reported.

Tornadoes/Microbursts: Medium-Low Risk

Risk of tornadoes and microbursts is considered to be medium in Hampden County. Tornadoes rarely occur in this part of the country; therefore, assessing damages is difficult. Buildings have

not been built to Zone 2, Design Wind Speed Codes. Estimated damages to 10% of structures with 20% damages $10,829,674. Estimated cost does not include building contents, land values or damages to utilities.

- One past tornado incident is recorded in the Town of Hampden in 1979; the event recorded as F1 (moderate tornado) damaged/destroyed homes on Potash Hill Lane.
- 15 other incidents of tornado activity, all F2 (significant tornado) or less, occurred in Hampden County between 1959 and 2005.
- River corridors and hill tops are susceptible.

Wildfires/Brushfires: Medium Risk

Approximately 73% percent of Hampden's total land area or about 9,140 acres is undeveloped (7,918 acres forested), and is therefore at risk of fire. Fortunately, Massachusetts receives more than 40 inches of rain per year, making wildfires an uncommon event.

In Hampden, brushfires are somewhat common, though the majority are small and quickly contained. There are, however, no records of wildfires or burned acreage, reported to the Massachusetts' National Fire Incident Reporting System for 2007 in Hampden.

The growth of residential development in Town puts more homes and related structures closer to forestlands, increasing susceptibility to impacts from brushfires or wildfires. Steep slopes and ledge outcroppings add to the risk as accessing some of these new home locations in the event of a fire is difficult. The entire town has minimal forest fire protection.

<u>Forested, Agricultural, and Recreational Lands</u>

Moderate risk exists for potential wildfire incidents in the forested and agricultural portions of town. Because there is forested and agricultural land scattered throughout Hampden, it is difficult to pinpoint exact locations that could be more susceptible to brushfires than another. There are few structures in these areas that could be affected by a wildfire incident, depending on its exact location, but no critical facilities. Assuming up to 4 structures could be impacted by a wildfire in one of these agricultural areas, with 100% damage to 100% of the structures, estimated costs of repairing or replacing would range, up to $991,800. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Agricultural areas with high fuel content have more potential to burn.
- Limited access for reaching some areas if a wildfire occurs in this area.

Earthquakes: Medium-Low Risk

A complete list of earthquakes affecting New England can be found in Table 3-1 and 3-2. None of the recorded earthquakes have been noted to cause any damage in Hampden or the surrounding area.

In the event of a significant earthquake, there is moderate potential for serious damage in the commercial corridor in town. Structures are mostly of wood frame construction, estimated loss 20% of town assessed structural valuation $108,296,741. Costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures are not included.

Dam Failure: Low Risk

Hampden has a history of one dam failure, during the 1955 flood. However, there are several minor dams or other water-control devices throughout town, mostly owned privately.

- 1955 flood, major dam along Scantic River broke, never reconstructed
- None of current dams in town hold significant amounts of water

Pondview Drive

Two homes are located in the inundation zone of the Gleason Pond Dam. Assuming 100% damage to 100% of the structures, the estimated costs of repairing or replacing would be $495,900. In addition, the water flow during a dam failure could also significantly impact the culvert under Wilbraham Road, most likely washing out that stretch of the road. This estimate does not factor in the cost of repairing or replacing the road, or any power or telephone lines, or the contents of structures.

Drought: Low Risk

Hampden has had limited experience with severe drought conditions. The town has not experienced a threat to its water supply, and doesn't anticipate any severe water shortages throughout town. However, because there is no (town-wide) public water supply, there is a risk of individual private wells drying up. There is some history of residents' wells drying up, mostly due to increased development nearby, *i.e.*, in the northwest corner of Town. Additionally, even minor droughts will increase the risk of wildfire, especially in areas of high recreational use.

- There is a history of private wells drying up, approximately 1-2/year.
- Forested and agricultural areas with high fuel content have more potential to burn.
- Several years of drought-like conditions in Western Massachusetts, 1940-1952, 1980-1983, and 1995-2001.
- Drought conditions currently do not exist in Massachusetts.

Man-Made Hazards - Hazardous Materials: Medium Risk

Hampden relies on Springfield's HazMat team for responding to incidents involving hazardous materials through a mutual aid agreement. There is no history of any major accidents involving some sort of oil or chemical spill, but transportation of chemicals and bio-hazardous materials by vehicle transport on Main Street is a concern. Small areas of hazardous materials storage increase the potential for future incidents.

(Past and Potential Hazards/Critical Facilities Map Located in Appendix D)

Profiling the Natural Hazards

In order to review the likelihood of a specific hazard occurring, to identify the location of occurrence, and to assess the impacts of the hazard event, a *Hazard Identification and Analysis Matrix* was prepared to organize the information that was gathered for this project.

The matrix is organized into the following sections: Type of Hazard, Location of Occurrence, Extent of Impacts, Previous Occurrences, and Hazard Index. The Hazard Index was completed to rank the hazards according to the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each of the matrix categories is provided below. The completed Matrix is shown on Table 3-7.

Type of Hazard

The natural hazards identified for Hampden include floods, severe snowstorms/ice storms, hurricanes/severe wind, tornadoes/microbursts, wildfires/brushfires, earthquakes, dam failures, and droughts. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may all cause wind-related damage. A more detailed description of each type of hazard is included in the earlier section of this chapter.

Location of Occurrence

The classifications are based on the area of the Town of Hampden that would potentially be affected by the hazard. The following scale was used:

Table 3-4: Location of Occurrence, Percentage of Town Impacted of Given Natural Hazard

LOCATION OF OCCURRENCE	PERCENTAGE OF TOWN IMPACTED
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Extent of Impacts

The extent of direct impacts an affected area could potentially suffer were classified according to the following scale:

Table 3-5: Extent of Impacts, Magnitude of Multiple Impacts of Given Natural Hazard

EXTENT OF IMPACTS	MAGNITUDE OF MULTIPLE IMPACTS
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

Source: Information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Previous Occurrences

Whether or not previous hazard events had occurred is also included in the chart. If warranted, detailed descriptions of specific previous occurrences have been made in the Vulnerability Assessment section above.

Probability of Future Events

The likelihood of a future event for each natural hazard was derived based on local knowledge of previous events and classified according to the following scale:

Table 3-6: Frequency of Occurrence and Annual Probability of Given Natural Hazard

FREQUENCY OF OCCURRENCE	ANNUAL PROBABILITY
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Hazard Index

The hazard index ratings were determined after assessing the frequency, location and impact classifications for each hazard. The hazard index ratings are based on a scale of 1 (highest risk) through 5 (lowest risk). The ranking is qualitative and is based, in part, on local knowledge of past experiences with each type of hazard. The size and impacts of a natural hazard can be unpredictable however; many of the mitigation strategies currently in place and many of those

proposed for implementation can be applied to the expected natural hazards, regardless of their unpredictability.

The Hazard Ratings are labeled as follows:

1 – High Risk
2 – Medium-High Risk
3 – Medium Risk
4 – Medium Low Risk
5 – Low Risk

Table 3-7: Hazard Identification and Analysis Worksheet for Hampden

TYPE OF HAZARD	LOCATION	EXTENT	PREVIOUS OCCURRENCES	PROBABILITY OF FUTURE EVENTS	HAZARD RISK INDEX RATING
Flooding (100-year)	**Large**	**Limited**	**Yes**	**Low**	**2**
Flooding (localized)	**Medium**	**Minor**	**Yes (extensive)**	**Very High**	**1**
Severe Snowstorms/ Ice Storms	**Large**	**Limited**	**Yes (only 22 storms since 1960 rated major-extreme)**	**Very High**	**1**
Hurricanes/Severe Wind	**Large**	**Minor**	**Yes (minimal)**	**Very Low**	**4**
Tornadoes/Microbursts	**Small**	**Catastrophic**	**Yes (minimal)**	**Very Low**	**4**
Wildfire/Brushfire	**Small**	**Minor**	**Yes (minimal)**	**Very High**	**3**
Earthquakes	**Large**	**Catastrophic**	**Yes (minimal)**	**Very Low**	**4**
Dam Failures	**Small**	**Minor**	**Yes (minimal)**	**Very Low**	**5**
Drought	**Small**	**Minor**	**Yes (minimal)**	**Very Low**	**5**
Man-Made Hazards: Hazardous Materials	**Small**	**Limited**	**None**	**Very Low**	**3**

Source: information adapted from Town of Holden Beach North Carolina Community-Based Hazard Mitigation Plan, July 15, 2003 and the Massachusetts Emergency Management Agency (MEMA).

4 – CRITICAL FACILITIES

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort.
- Maintains an existing level of protection from hazards for the community.
- Would create a secondary disaster if a hazard were to impact it.

Critical Facilities within Hazard Areas

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. There are several critical facilities that fall within the 100-year floodplain as shown in the table at the end of this section.

The Critical Facilities List for the Town of Hampden has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Hampden's Hazard Mitigation Committee has broken up this list of facilities into four 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 have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Hampden. The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster. The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster. The Past and Potential Hazards/Critical Facilities Map (Appendix D) identifies these facilities.

The critical facilities and evacuation routes potentially affected by hazard areas are identified in Table 4-1, following this list.

Category 1 – Emergency Response Services

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards.

1. Emergency Operations Center
Primary: Town House – 625 Main Street
Secondary: Thornton Burgess School – 85 Wilbraham Road

2. Fire Station
Hampden Volunteer Fire Department – 19 North Road

3. Police Station
Hampden Town Police Department – 625 Main Street

4. Highway Department
Highway Department – 589 Main Street

5. Water District

Public well serving nine residences downstream of landfill

6. Emergency Fuel Stations

Highway Department – 589 Main Street

7. Emergency Electrical Power Facility

Town House - emergency generator to serve EOC and Police Departments
3 portable generators

8. Emergency Shelters

*Thornton Burgess School – 85 Wilbraham Road
*Green Meadow School – 38 North Road
*Town House – 625 Main Street
Hampden Senior Center – 104 Allen Street
Bethlehem Baptist Church – 216 Allen Street

*Shelters also have generators.

9. Water Sources

Numerous locations in Hampden, any available.

10. Transfer Station

On Past & Potential Hazards/Critical Facilities Map – off of Cross Road

11. Helicopter Landing Sites

Thornton Burgess Middle School parking lot
Green Meadow Elementary School parking lot
(Permitted anywhere feasible.)

12. Communications

Four cell/radio towers throughout town – see Past & Potential Hazards/Critical Facilities Map.

13. Primary Evacuation Routes

Main Street
South Monson Road
Glendale Road/North Monson Road
Wilbraham Road
Somers Road
North Road
Chapin road
Allen Street
East Longmeadow Road

14. Bridges/Culverts Located on Evacuation Routes

Mill Road – where Scantic River crosses
Somers Road – where Scantic River crosses
Main Street – three locations, crossings of West Brook, Big Brook, and East Brook

Chapin Road – where Scantic River crosses
Scantic Road – three locations, crossings of unnamed tributary to Scantic River, Temple Brook, and Rockadundee Brook
South Monson Road – where Temple Brook crosses (twice)
South Road – where unnamed tributary to Scantic River crosses
Glendale Road – where East Brook crosses (twice)
East Longmeadow Road – where Watchaug Brook crosses
Rockadundee Road – where Rockadundee Brook crosses

Category 2 – Non Emergency Response Facilities

The town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Hampden.

1. Problem Culverts

East Longmeadow Road – where Watchaug Brook crosses
Main Street – three locations, crossings of West Brook, Big Brook, and East Brook
Glendale Road – where East Brook crosses (two locations)

Category 3 – Facilities/Populations to Protect

The third category contains people and facilities that need to be protected in event of a disaster.

1. Special Needs Population

Mary Lyon Nursing Home – 32 Main Street
South Wood Development – Stony Hill Road
Tall Pines Development – Stony Hill Road

2. Elderly Housing/Assisted Living

Centennial Commons Senior Housing – 26 Springmeadow Lane
47 Oak Knoll Drive
17 Baldwin Drive

3. Public Buildings/Areas

Hampden Senior Center – 104 Allen Street
Laughing Brook Wildlife Sanctuary

4. Schools

Green Meadows Elementary School – 38 North Road
Thornton Burgess Middle School – 85 Wilbraham Road
Green Valley Pre-School – 10 Allen Street
Several private daycares throughout town – see Past & Potential Hazards/Critical Facilities Map.

5. Churches

Bethlehem Baptist Church – 216 Allen Street
Federated Community Church – 590 Main Street
St. Mary's Catholic Church – 28 Somers Road

6. Historic Buildings/Sites

Two cemeteries on Past & Potential Hazards/Critical Facilities Map.

7. Apartment Complexes

White Birch Apartments – 359 Main Street
86 Somers Road – 4 unit building

8. Employment Centers

Allen Street-East Longmeadow Road area

Category 4 – Potential Resources[11]

Contains facilities that provide potential resources for services or supplies.

1. Food/Water

Village Food Mart – Somers Road
Big Y Supermarket – 525 Main Street, East Longmeadow

2. Hospitals/Medical Supplies

Mary Lyon Nursing Home – 32 Main Street
Big Y Pharmacy – 525 Main Street, East Longmeadow

3. Gas

Convenience Plus – 42 Somers Road

4. Building Materials Suppliers

Hampden Hardware and General Store – 480 Main Street

5. Heavy & Small Equipment Suppliers

Town volunteers

6. Gravel Pits

Kibbe's Gravel – Somers Road

[11] These Category 4 Critical Facilities are not included on the Past and Potential Hazards/Critical Facilities Map.

Table 4-1: Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding (100-year Flood)	Floodplain along Scantic River	Helicopter landing sites Green Meadows School Water District	Main Street
	Floodplain along Rockadundee Brook		Rockadundee Road
	River Park Drive		
	Mohawk Drive		
Flooding	Glendale Road		Glendale Road
	Main Street – at Scantic Road Glendale Road split	Town House/Police Dept. (EOC); Fire Dept	Main Street; Scantic Road; Glendale Road
	Main Street – at Memorial Park Drive	Town House/Police Dept. (EOC); Fire Dept	Main Street
	Colony Drive		
Severe Snow/Ice Storm	Forest Hills Road and Valley View Road		
	Pondview Drive		
	Mountain Road		
	North Road		North Road
	Ames Road		Ames Road
Hurricanes/Severe Wind	Mountain tops		
Wildfires/Brushfires	Agricultural/Forest/Recreation Land		

Dam Failure	Pondview Drive		
Drought	Private Wells		
Hazardous Materials	Main Street		Main Street

(Past & Potential Hazards/Critical Facilities Map Located In Back of Plan, Appendix D)

5 – CURRENT MITIGATION STRATEGIES

Flooding

The Floodplain Map for the Town of Hampden shows the 100-year and 500-year flood zones identified by FEMA flood maps. The 100-year flood zone is the area that will be covered by water as a result of a flood that has a one percent chance of occurring in any given year. Likewise, the 500-year flood has a 0.2 percent chance of occurring in any given year. In Hampden, there are several floodplain areas – primarily along Scantic River, running through the center of town. In addition, there are some floodplains areas along Watchaug Brook and South Branch of the Mill River, and along the western border of town; along the confluence of Big Brook, East Brook, Temple Brook, and Rockadundee Brook in the eastern portion of town. There are some smaller 500-year floodplains mapped as well, in several low-lying areas throughout Hampden.

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. However, a key factor in flooding is the water capacity of water bodies and waterways, the regulation of waterways by flood control structures, and the preservation of wetlands. As more land is developed in town, more flood storage is demanded of the town's these water bodies and waterways.

One of the goals of this Natural Hazards Mitigation Plan is to evaluate all of the town's existing policies and practices related to natural hazards and identify potential gaps in protection.

Management Plans[12]

The Comprehensive Emergency Management (CEM) Plan for Hampden lists the following generic mitigation measures for flood planning:

1. Identify areas in the community that are flood prone and define methods to minimize the risk. Review National Flood Insurance Maps.
2. Disseminate emergency public information and instructions concerning flood preparedness and safety.
3. Community leaders should ensure that Hampden is enrolled in the National Flood Insurance Program.
4. Strict adherence should be paid to land use and building codes, (*e.g.* Wetlands Protection Act), and new construction should not be built in flood prone areas.
5. Ensure that flood control works are in good operating condition at all times.
6. Natural water storage areas should be preserved.
7. Maintain plans for managing all flood emergency response activities including addressing potentially hazardous dams.

[12] Comprehensive Emergency Management Plan for the Town of Hampden.

The Comprehensive Emergency Management (CEM) Plan for Hampden also lists the following generic preparedness and response measures for floods:

1. Place EOC personnel on standby during stage of flood 'watch' and monitor NWS/New England River Forecast Center reports.
2. Ensure that public warning systems are working properly and broadcast any information that is needed at this time.
3. Review mutual aid agreements.
4. Monitor levels of local bodies of water.
5. Arrange for all evacuation and sheltering procedures to be ready for activation when needed.
6. Carry out, or assist in carrying out needed flood-proofing measures such as sand bag placement, etc.
7. Regulate operation of flood control works such as floodgates.
8. Notify all Emergency Management related groups that will assist with flood response activities to be ready in case flood 'warning'.
9. Broadcast warning/notification of flood emergency.
10. Coordinate traffic control and proceed with evacuation of affected populations as appropriate.
11. Open and staff shelters and reception centers.
12. Undertake, or continue to carry out, flood proofing measures.
13. Dispatch search and rescue teams.
14. Dispatch emergency medical teams.

Flood Control Structures

The town's Highway Department manages a regularly-updated priority list of needed culvert replacement and other construction projects. They are currently seeking funding from the Hazard Mitigation Grant Program to address the top priority needs. There is also one dike in town, the Chaffin Pond Dike owned by the Town.

Land Use Regulations that Mitigate Impacts from Flooding

The Town of Hampden has adopted several land use regulations that serve to limit or regulate development in floodplains, to manage stormwater runoff, and to protect groundwater and wetland resources, the latter of which often provide important flood storage capacity. These regulations are summarized below and their effectiveness evaluated in Table 5-1.

Zoning By-Laws

The Town of Hampden has established a set of bylaws designed in part to "to conserve health and secure safety from fire, flood, and other dangers; to prevent overcrowding of land and avoid

undue concentration of population; to conserve natural resources and prevent pollution of the environment; to encourage the most appropriate use of land throughout the town..." The Zoning By-Laws include several provisions that mitigate the potential for flooding, some of the relevant language is included below.

The Town has adopted several zone districts which have regulations that assist in mitigating flood hazards. Primarily, the Floodplain/Wetland District regulates development within the floodplain and nearby wetlands and other waterbodies. The Golf Recreation District, the Non-Profit Educational and Recreational District also have requirements that affect flood hazards. Additionally, the Water Supply Protection Overly District aims to protect groundwater resources.

The Zoning By-Laws also allow the Planning Board to request an Environmental Impact Study for new construction and new uses. Additionally, there are requirements and restrictions on earth removal and performance standards. Special permits and/or site plan approvals can also be used to require adherence to specific regulations dealing with surface and ground water protection, runoff, flooding, etc.

Section 5: New Construction and New Uses

5.7 Environmental Impact Study

The Planning Board may require an environmental impact study in the case where the additional rate and volume of runoff created by the subdivision/development may cause an impact on downstream properties, receiving streams, etc. The developer must undertake a comprehensive hydrology study of the area which is planned to be developed and the downstream and/or adjacent properties.

1. Drainage area, including:
    a. Area
    b. Cover type
    c. Soil types
    d. Soil percolation rates for each type of soil cover material encountered.
2. Drainage patterns
3. Dry/wet weather water levels of all streams, rivers, ponds, retention basins, etc.
4. Rate of runoff correlated:
    a. Intensity of storm event
    b. Intensity and duration of storm intent
    c. Runoff characteristics vs. frozen and unfrozen ground conditions
5. Predictions of the following must be developed:
    a. Time Parameters
        1. Slope (s) within the affected drainage area
        2. Flow length
        3. Surface roughness
        4. Time of concentration
        5. Time of travel
        6. Lag time

b. Runoff rates and effect upon receiving streams and/or properties for both the existing drainage area and the affected drainage area for the following storm frequencies:

1. 10 year
2. 25 year
3. 100 year
4. 500 year

If, in the opinion of the Planning Board, the data generated above indicates that there may be an impact on downstream properties, public or private, then the Board reserves the right to require the developer to install retention basins to prevent any impact on downstream properties. The retention basin must be of sufficient capacity to retain the full runoff created as a result of the development for a 25-year storm.

All of the above must be prepared by an engineering firm knowledgeable and proficient in hydrology.

All data generated through both field and office computations must be stamped by a registered professional engineer.

Section 6: Use Regulations

6.9 Floodplain and Wetland Districts

6.91 The purpose of these Districts are:

- To provide that the lands in the Town of Hampden subject to seasonal or periodic flooding as described hereinafter shall not be used for residence or other purpose in such a manner as to endanger the health or safety of the occupants thereof.
- To protect, preserve and maintain the water table and water recharge areas within the Town so as to preserve present and potential water supplies for the public and safety of the Town of Hampden.
- To assure the continuation of the natural flow pattern of the water course (s) within the Town of Hampden in order to provide adequate and safe flood water storage capacity to protect persons and property against the hazards of flood inundation.

6.92 Floodplain District Boundaries and Base Flood Elevation and Floodway Data

6.921 The Floodplain District is herein established as an overlay district. The district includes all special flood hazard areas designated on the Town of Hampden Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA) for the administration of the NFIP dated November 15, 1978 as zone A, AE, AH, AO, A1-30, A99, V, V1-30, VE, and the FEMA Flood boundary and Floodway Map dated November 15, 1978, both maps which indicate the 100-year regulatory floodplain. The exact boundaries of the district may be defined by the 100 year base flood elevations shown on the FIRM and further defined by the Flood Insurance study booklet dated May 1978. The FIRM, Floodway Maps, Flood Insurance study booklet are incorporated herein by reference and are on file with the Town Clerk, Planning Board, Building Inspector, and Conservation Commission.

6.922 In Zone A, A1-30 and AE, along watercourses that have not had a regulatory floodway designated, the best available Federal, State, Local or other floodway data shall be used to prohibit encroachments in floodways which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

6.923 Notification of Watercourse Alteration - Notify, in a riverine situation, the following of any alteration or relocation of a watercourse:
1. Adjacent Communities
2. Bordering State
3. NFIP State Coordinator
4. NFIP Program Specialist

6.924 Use Regulations

1. The Floodplain District is established as an overlay district to all other districts. All development in the district, including structural and non-structural activities, whether permitted by right or special permit, must be in compliance with Chapter 131, Section 40 of the Massachusetts General Laws and with the following:
   - Section of the Massachusetts State Building Code which addresses floodplain areas - currently 780 CMR 2102.0 "Flood Resistant Construction";
   - Wetlands Protection Regulations - currently 310 CMR 10.00;
   - Inland Wetlands Restriction - currently 302 CMR 6.0;
   - Minimum Requirements for the Subsurface Disposal of Sanitary Sewage, currently - 310 CMR 15, Title V.

   Any Variances from the provisions and requirements of the state regulations referenced above may only be granted in accordance with the required variance procedures of these State regulations.
2. In the Wetland District, and in the Flood Plain outside of the Designated Floodway, no new buildings other than accessory buildings or municipal public works structures may be erected or constructed. Construction of accessory buildings in the Flood Plain shall be allowed only so long as they re anchored to prevent flotation and lateral movement, and are constructed with flood-resistant materials and methods, as determined by the Building Inspector in conformance with the State Building Code. Additionally, no dumping, filling, or transfer or relocation shall be permitted in the above mentioned districts, nor shall any land, building, or structure be used for any purpose except:
   a. Outdoor recreation, including play areas, nature study, boating, fishing, and hunting where legally permitted, but excluding buildings and structures.
   b. Non-commercial signs (as permitted in the Residential District), foot, bicycle, and/or horse paths and bridges, and wildlife management areas, provided such use does not affect the natural flow pattern on any watercourse.

c. Grazing and farming, including truck gardening and harvesting of crops.
d. Forestry and nurseries.
e. Conservation of water, plants, and wildlife.
f. Dwellings and other structures and uses lawfully existing prior to the adoption of these provisions, but not including substantial improvements as defined in the National Flood Insurance Programs Rules and Regulations published in the Federal Register of October 26, 1976.
g. Other uses, which are permitted in the underlying zoning districts, and are proposed within the Wetland and Flood Plain outside of the Designated Floodway, may be allowed by Special Permit from the Board of Appeals subject to the following:
    (1) All proposals for special permits must have been referred to the Planning Board, the Board of Health, and the Conservation Commission for review to assure that: a) such proposals minimize flood damage; b) all public utilities and facilities are located and constructed to minimize or eliminate flood damage; and c)adequate drainage is provided to reduce exposure to flood hazards. The proposals must be reported favorably by two of the three boards. If the boards fail to act upon the proposal or fail to notify the Town Clerk and the applicant of their action within forty-five days after its submission, the proposal shall be deemed approved, and the Town Clerk shall issue a certificate to the same effect.
    (2) The proposed use will not be detrimental to the public health, safety and welfare.
    (3) All proposed new construction in the Flood Plain must be in conformance with the regulations as referenced in Section 6.924-1 of this bylaw as determined by the Building Inspector.
    (4) In the Flood Plain all subdivision proposals and other proposed new developments greater than fifty (50) lots of five (5) acres, whichever is less, must include base flood elevation data.
    (5) All new water systems must be located and designed so as to avoid impairment due to flooding.
    (6) Within Zones A1-30, all new construction and substantial improvements (the cost of which equals or exceeds fifty percent of the market value of the structure) of residential and non-residential structures shall conform to the regulations as referenced in Section 6.924-1 of this bylaw.
    (7) Within Zone A (un-numbered A zone), where the base flood elevation is not provided on the Flood Insurance Rate Map, the applicant shall produce the best available Federal, State, local or other floodway data which shall be used to ensure conformance to the State Building Code Section 2102.0. In cases where date is not available the Wetlands Protection Act may require engineering studies to be performed in order to determine base flood elevations in unnumbered A zones.

(8) Where watertight floodproofing of a structure is permitted in lieu of elevation, a registered professional engineer or architect shall certify to the building inspector that the methods used are in conformance with the regulations as referenced in Section 6.924-1 of this bylaw.

(9) The proposed use must comply in all other respects to the provisions of the underlying District or Districts within which the land is located.

(10) No encroachments (including fill, new construction, substantial improvements to existing structures, or other development) shall be allowed unless it is demonstrated by the applicant that the proposed development, as a result of compensating actions, will not result in any increase in flood levels during the occurrence of a 100-year flood in accordance with the Federal Emergency Management Agency's regulations for the National Flood Insurance Program.

6.93 Within the designated floodway, no encroachments, including fill, new construction, substantial improvements and other development shall be permitted, except for municipal public works structures and repairs to existing facilities.

6.94 The portion of any lot within the area delineated on the Hampden Zoning Map as Flood Plain and Wetland district or other existing wetland as defined by M.G.L. Chapter 131, Section 40, may be used to meet the area and yard requirements for the district or districts in which the remainder of the lot is situated (provided the proposed construction site be a non-wetland or non-flood plain area of at least 75% of the minimum lot area requirements).

6.95 Where the bounds are in doubt, the burden of proof shall be on the owner(s) of the land in question, to show where they should be properly located. However, the Town of Hampden retains its authority to determine the actual boundaries of the flood plain/wetland within the area in question.

6.96 The donation of recreational easements to provide public access to the Scantic River shall be encouraged within the Floodplain District.

6.7 The Golf Recreational District

6.72 Requirements for Developing:

a.(3) The Preliminary Plan is intended to show all features affecting the function of the golf course area, including, but not limited to runoff and drainage; circulation of vehicles and pedestrians; recreational facilities and their use: utilities such as sewage, water, electricity, gas, for all areas: and include hydrological, soil, and sub-surface studies evaluating the site for development. The Preliminary Plan shall include a general time table for construction of the entire project.

b.(3) The Definitive Plan is intended to show all aspects of the commercial golf course and shall include, but not limited to, location of streets, parking areas, sidewalks, landscaping utilities, drainage and structures. The Definitive Plan shall include a time table for the construction of the drainage system, roads, all landscaping, and buildings.

6.8 Non-Profit Educational and Recreational District

6.82 Layout and Design Requirements - Heights, Set-back and Other Specifications

8. Surface Drainage: There shall be no change in direction, volume, or velocity without prior approval of the Planning Board. Drainage shall be piped and discharged into a natural drainage area if feasible from a cost and engineering analysis.

6.83 Developmental Requirements

3. Open Space: A minimum of seventy five per cent (75%) of the total land area will remain in a natural state except for clearly marked nature trails and selective tree and brush cutting necessary to enhance the permitted uses.

6.84 Procedure for Submitting an Application for a Non-Profit Educational and Recreational Facility

1. (a) The site plan is intended to show all features affecting the function of the facility, including, but not limited to, run-off and drainage, specific activity areas and their use, utilities such as sewage, water, electricity and gas for all areas, and hydrological, soil, and sub-surface studies evaluating the site for development.

2. (a) The Definitive Plan is intended to show all aspects of the project and shall include, but not limited to, location of streets, parking areas, sidewalks, landscaping, utilities, drainage, and structures.

6.11 Water Supply Protection Overlay District

6.111 Purpose of District

To promote the health, safety and welfare of the community by protecting and preserving the surface and groundwater resources of the Town of Hampden and the region from any use of land or buildings which may reduce the quality and quantity of its water resources.

6.112 Scope of Authority

The Water Supply Protection District is an overlay district and shall be superimposed on the other districts established by this bylaw. All regulations of the Town of Hampden Zoning Bylaw applicable to such underlying districts shall remain in effect, except that where the Water Supply Protection District imposes additional regulations, such regulations shall prevail.

6.113 District Delineation

1. The Water Supply Protection District is herein established to include all lands within the Town of Hampden, lying within the Interim Wellhead Protection Area for town water supply wells, and all lands lying within the primary recharge areas of groundwater aquifers which now or may in the future provide water supply for town

residents. The map entitled "Water Supply Protection District," Town of Hampden, on file with the Town Clerk, delineates the boundaries of the district.

2. Where the bounds delineated are in doubt or in dispute, the burden of proof shall be upon the owner(s) of the land in question to show where they should properly be located. At the request of the owner(s) the Town may engage a professional hydrogeologist to determine more accurately the location and extent of a primary aquifer recharge area, and may charge the owner(s) for all or part of the cost of the investigation.

6.114 Permitted Uses

The following uses are permitted within the Water Supply Protection District, provided that they comply with all applicable restrictions in this bylaw, including but not limited to Section 6.116:

1. single family residences;
2. residential accessory uses, including garages, driveways, private roads, utility rights of way, and onsite wastewater disposal systems;
3. agricultural uses such as farming, grazing and horticulture;
4. forestry and nursery uses;
5. outdoor recreational uses, including fishing, boating, and play areas;
6. conservation of water, plants, and wildlife; wildlife management areas;
7. excavation for earth removal, provided that the requirements of Section 4.6 are met, and an earth removal permit is granted by the Special Permit Granting Authority;
8. day care centers, day care homes, and school age child care programs;
9. structures for educational or religious purposes.

6.115 Prohibited Uses

The following uses are prohibited within the Water Supply Protection District:

1. Business and industrial uses, not agricultural, which generate, treat, store, or dispose of hazardous wastes, except for the following:
    a. very small quantity generators of hazardous waste, as defined by 310 CMR 30.00 as amended which generate less than 20 kilograms or 6 gallons of hazardous waste per month may be allowed by Special Permit in accordance with Section 4.8 of this bylaw;
    b. household hazardous waste collection centers or events operated pursuant to 310 CMR 30.390 as amended;
    c. waste oil retention facilities required by M.G.L. C.21, §52A, and;
    d. treatment works for the remediation of contaminated water supplies, which are approved by Massachusetts Department of Environmental Protection and designed in accordance with 314 CMR 5.00 as amended.
2. business or industrial uses, not agricultural, which dispose of process wastewaters on-site;
3. commercial fuel oil storage and sales;
4. solid waste landfills, dumps, auto recycling, auto graveyards, junk and salvage yards, landfilling or storage of sludge and septage, with the exception of the disposal of brush or stumps;
5. storage of liquid petroleum products, except for the following:

a. Storage which is incidental to:
   (1) normal household use, outdoor maintenance, or the heating of a structure;
   (2) emergency generators required by statute, rule or regulation;
   (3) waste oil retention facilities required by statute, rule, or regulations;
   (4) treatment works approved by the Massachusetts Department of Environmental Protection designed in accordance with 314 CMR 5.00 for the treatment of contaminated ground or surface waters; provided that storage, listed in items 1-4 above, shall be in a free standing, above ground container within a structure or within the basement of a structure, with secondary containment adequate to contain a spill the size of the containers total storage capacity. The storage tank and piping must comply with all applicable provisions of 527 CMR 9.00 Massachusetts Board of Fire Prevention regulations.

b. Replacement of storage tanks or system for the keeping, dispensing or storing of gasoline, which existed at the time of adoption of this bylaw, provided that:
   (1) all such replacement storage tanks or systems shall be located underground as required by Massachusetts Board of Fire Prevention regulation 527 CMR 14;
   (2) all such storage systems shall be protected by one of the secondary containment systems specified in Massachusetts Board of Fire Prevention regulations 527 CMR 9.08(3); and
   (3) the head of the Fire Department may deny an application for tank replacement, or approve it subject to conditions if he or she determines that it constitutes a danger to public or private water supplies, in accordance with 527 CMR 9.26(4)(d).

   Replacement of all other storage tanks for liquid petroleum products other than gasoline must be above ground, in accordance with Section 6.115-5 above.
   (4) outdoor storage of salt, de-icing materials, pesticides or herbicides;
   (5) dumping or disposal of any hazardous material or hazardous waste on the ground, in water bodies, in septic systems or in other drainage system. This shall include the use of septic system cleaners which contain toxic chemicals such as methylene chloride and 1-1-1 trichlorethane.
   (6) stockpiling and disposal of snow or ice removed from highways and streets located outside of the Water Supply Protection District that contains sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for snow and ice removal;
   (7) wastewater treatment works subject to a groundwater discharge permit under 314 CMR 5.00 except the following:
      (a) the replacement or repair of an existing system(s) that will not result in a design capacity greater than the design capacity of the existing system(s);
      (b) the replacement of an existing subsurface sewage disposal system(s) with wastewater treatment works that will not result in a design capacity greater than the design capacity of the existing system(s), and;

(c) treatment works designed for the treatment of contaminated ground or surface waters subject to 314 CMR 5.00.
(d) residential, commercial or industrial uses within Zone I of any municipal water supply well; and
(e) multifamily resident uses which are not served by the municipal sewer system.

6.116 Performance Standards

All uses, whether allowed by Special Permit or by right, must meet the performance standards herein:

(1) Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the public highway safety requirements, and its use shall be eliminated on roads which may be closed to the public in winter.
(2) The storage of sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads shall be covered and located in a paved surface with berms, or within a structure designed to prevent the generation and escape of contaminated run-off.
(3) Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 333 CMR 10.03 (30, 31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater.
(4) The storage of commercial fertilizers and soil conditioners shall be within structures designed to prevent the generation and escape of contaminated runoff or leachate.
(5) To the extent feasible, all new permanent animal manure storage areas shall be covered and/or contained to prevent the generation and escape of contaminated run-off or leachate.
(6) All hazardous materials, as defined in M.G.L. Chapter 21E, must be stored either in a free standing container within a building, or in a free standing container above ground level with protection to contain a spill the size of the container's total storage capacity.
(7) For commercial and industrial uses, to the extent feasible, run-off impervious surface shall be recharged on the site by stormwater infiltration basins or similar systems covered with natural vegetation. Such run-off shall not be discharged directly to rivers, streams, or other surface water bodies. Dry wells shall be used only where other methods are infeasible. All such basins and wells shall be preceded by oil, grease, and sediment traps to facilitate removal of contamination. All recharge areas shall be permanently maintained in full working order by the owner(s). Infiltration systems greater than 3 feet deep shall be located at least 100 feet from drinking water wells, and shall be situated at least 10 feet down-gradient and 100 feet up-gradient from building foundations to avoid seepage problems. Infiltration basins and trenches shall be constructed with a three foot minimum separation between the bottom of the structure and maximum groundwater elevation.
(8) In accordance with the State Plumbing Code, all vehicle maintenance facilities must have floor drains, unless they have received a variance from the State Plumbing Board, which must be connected to a municipal sewer system or to a state-approved

holding tanks in unsewered areas. All other facilities which use, store or maintain hazardous materials or wastes must, with state approval, seal floor drains or connect them to a sewer system or holding tank.

6.117 Special Permit Uses

Uses allowed by Special Permit obtained from the Planning Board:

a. commercial, industrial, governmental or educational uses which are allowed in the underlying district, and which are not prohibited in Section 6.115;

b. with respect to pre-existing non-conforming uses, any of the following changes in an existing business, commercial or industrial use:
   (1) increase in generation of hazardous wastes above quantities permitted in the Special Permit for the use;
   (2) increase in impermeable surfaces to greater than 15% of lot area or 2,500 square feet, whichever is greater;
   (3) change of use; and
   (4) enlargement in the building footprint greater than 25% of the existing footprint.

c. The rendering impervious of greater than 15% of the area of 2,500 square feet whichever is greater, provided that a system for artificial recharge of precipitation is developed. The management of stormwater and any artificial recharge systems developed shall be designed so as not to result in the degradation of groundwater.
   (1) For commercial uses, a stormwater management plan shall be developed which provides for the artificial recharge of precipitation to groundwater, where feasible. Recharge shall be attained through site design that incorporates natural drainage patterns and vegetation, and through the use of stormwater infiltration basin, infiltration trenches, porous pavement or similar systems. All infiltration practices shall be preceded by oil, grease, and sediment traps or other best management practices to facilitate removal of contamination.
   (2) For residential uses, recharge shall be attained through site design that incorporates natural drainage patterns and vegetation. To the extent possible, stormwater runoff from rooftops, driveways, roadways and other impervious surfaces shall be routed through areas of natural vegetation and/or devices such as infiltration basins, infiltration trenches or similar systems. Infiltration practices shall be utilized to reduce runoff volume increases to the extent possible as determined in accordance with infiltration standards and specifications established by the Soil Conservation Service. A combination of successive practices may be used to achieve the desired control requirements. Justification shall be provided by the person developing land for rejecting each practice based on site conditions. Any and all recharge areas shall be permanently maintained in full working order by the owner. Provisions for maintenance shall be described in the stormwater management plan.

Excavation for removal of earth, loam, sand, gravel and other soils or mineral substances shall not extend closer than five (5) feet above the historical high groundwater table (as determined from on-site monitoring wells and historical water table fluctuation data compiled by the United States Geological survey, whichever is higher). A monitoring well shall be installed by the property owner to verify groundwater elevations. This section shall not apply to excavations incidental to permitted uses, including but not limited to providing for the installation or maintenance or structural foundations, freshwater ponds, utility conduits or on-site sewage disposal.

(1) Access road(s) to extractive operation sites shall include a gate or other secure mechanism to restrict public access to the site.

(2) Upon completion of earth removal operations, all altered areas shall be restored with topsoil and vegetative plantings suitable to control erosion on the site. All find materials, such as clays and silts, removed as part of the earth removal operation and leftover as byproducts, shall be disposed of off-site to prevent damage to aquifer recharge characteristics.

d. Requirements for Special Permit in the Water Supply Protection District The applicant shall file nine (9) copies of a site plan prepared by a qualified professional with the Planning Board. The site plan shall at a minimum include the following information where pertinent.

(1) A complete list of chemicals, pesticides, fuels and other potentially toxic or hazardous materials to be used or stored on the premises in quantities greater than those associated with normal household use.

(2) Those businesses using or storing such toxic or hazardous materials shall file a hazardous materials management plan with the Planning Board, Hazardous Materials Coordinator, Fire Chief, and Board of Health which shall include:

(a) Provisions to protect against the discharge of hazardous materials or wastes to the environment due to spillage, accidental damage, corrosion, leakage or vandalism including spill containment and clean-up procedures.

(b) Provisions for indoor, secured storage of hazardous materials and wastes with impervious floor surfaces.

(3) The applicant will submit evidence of compliance with the Regulations of Massachusetts Hazardous Waste Management Act 310 CMR 30 and information on anticipated hazardous waste generation rates. Copies of Massachusetts Hazardous Waste Reporting forms shall be made available to the Zoning Enforcement officer upon request.

(4) Drainage recharge features and provisions to prevent loss of recharge.

(5) Provisions to control soil erosion and sedimentation, soil compaction, and to prevent seepage from sewer pipes.

(6) Periodic water quality monitoring may be required by the Planning Board, including sampling of wastewater disposed to on-site systems and sampling from groundwater monitoring wells to be located and constructed as specified in the Special Permit with reports to be submitted to the Planning Board, the Board of Health, and the Board of Water Commissioners. The Costs of monitoring, including sampling and analysis, shall be borne by the owner of the premises.

e. Additional Procedures for Special Permit in the Water Supply Protection District

(1) The Planning Board shall follow all special permit procedures contained in Section 10 of this Bylaw. In addition the Planning Board shall distribute copies of all application materials to the Board of Health, the Conservation Commission, and the Water Commissioners, each of which shall review the application, and following a vote, shall submit recommendations and comments to the Planning Board. Failure of boards to make recommendations within 35 days of distribution of the applications shall be deemed to be lack of opposition. One copy of the applications materials shall be transmitted to or retained by the Town Clerk for viewing by the public during office hours.

(2) The Planning Board may grant the required special permit only upon finding that the proposed use meets the following standards and those specified in Section 10 of the bylaw. The proposed use must:

(a) in no way, during construction or thereafter, adversely affect the existing or potential quality or quantity of water that is available in the Water Supply Protection District; and,

(b) be designed to avoid substantial disturbance of the soils, topography, drainage, vegetation and other water-related natural characteristics of the site to be developed.

(3) The Planning Board shall not grant a special permit under this section unless the petitioner's application materials include, in the Board's opinion, sufficiently detailed, definite and credible information to support positive findings in relation to the standards given in this section.

6.118 Non-conforming Use

Non-conforming uses which were lawfully existing, begun or in receipt of a building or special permit prior to the first publication of notice of public hearing for this bylaw may be continued. Such non-conforming uses may be extended or altered, as specified in M.G.L. C. 40A, §6, provided that there is a finding by the Planning Board that such change does not increase the danger of surface or groundwater pollution from such use.

Section 7: Development of Sites and Location of Buildings and Structures

7.7 Development and Performance Standards

7.72. General Application

All projects or uses requiring Special Permit, Special Permit with Site Plan Approval, or Site Plan Review – Administrative Review must demonstrate compliance with the commercial performance standards herein.

5. Storm Water Run-off

a. The rate of surface run-off from a site shall not be increased after construction. If needed to meet this requirement and to maximize groundwater recharge, increased run-off from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of detention ponds. Dry wells shall be used only where other methods are infeasible and shall require oil, grease, and sediment traps to facilitate removal of contaminants.
b. Neighboring properties shall not be adversely affected by flooding from excessive run-off.
c. The use of proven, alternative paving systems, such as porous paving, is highly encouraged to reduce the amount of impervious surface on developed sites.
d. The use of shared stormwater management structures and facilities is highly encouraged.

6. Erosion Control

Erosion of soil and sedimentation of streams and waterbodies shall be minimized by using the following erosion control practices:

a. Exposed or disturbed areas due to stripping of vegetation, soil removal, and regrading shall be permanently stabilized within six months of occupancy of a structure.
b. During construction, temporary vegetation and/or mulching shall be used to protect exposed areas from erosion. Until a disturbed area is permanently stabilized, sediment in run-off water shall be trapped by using staked hay bales or sedimentation traps.
c. Permanent erosion control and vegetative measures shall be in accordance with the erosion/sedimentation/vegetative practices recommended by the Natural Resources Conservation Service (NRCS).
d. All slopes exceeding 15% resulting from site grading shall be covered with four (4) inches of topsoil and planted with a vegetative cover sufficient to prevent erosion.
e. Dust control shall be used during grading operations if the grading is to occur within 200 feet of an occupied residence or place or business. Dust control methods may consist of grading fine soils on calm days only or dampening the ground with water.

7. Water Quality

All outside storage facilities for fuel, hazardous materials or waste, and potentially harmful raw materials shall be located within an impervious, diked containment area adequate to hold one hundred ten (110) percent of the total volume of liquid kept within the storage area.

7.8 Earth Removal

Except as otherwise provided in this section, there shall be no removal from the premises in any district of earth, loam, sand, gravel, clay or quarry stone, except as follows:

1. Town Uses: In all districts, except for the Flood Plain and Recreational districts, the Building Inspector may issue permits for the removal of earth, loam, sand, gravel, clay or quarry stone from the premises in cases where such material is for use by the Town.
2. Residential District - Limited: In residential districts, the Building Inspector may issue a permit for removal of no more than 250 (Amended 4/24/06) cubic yards of fill from the premises, provided such fill results from construction of a foundation, swimming pool, or driveway, for which a building permit has been issued. A permit issued under this provision shall be valid for one month.
3. Residential District: The Board of Appeals may, after a public hearing, issue a special permit for the removal of surplus material resulting from bona fide construction, landscaping, or agricultural land improvement being executed on the premises, providing that no rock crushing will be permitted in a Residential District, and also provided that permits filed for a Residential District for a stated purpose shall not exceed one year with repetitive petitions permitted only after a concurring vote of a majority of the members of the Planning Board and a concurring vote of four members of the Board of Appeals. Such permits shall be subject to the provisions of Section 7.8.5.
4. Districts Other than Residential: The Board of Appeals may, after a public hearing at which the Planning Board may submit a report, issue a special permit for the removal of earth, loam, sand, gravel, clay or quarry stone in any zone, other than Residential, subject to the provisions of Section 7.8.5.
5. Permits issued by the Board of Appeals (those under sections 7.8.3 and 7.8.4) shall be subject to the following requirements:
    1. The applicant shall submit a plan prepared by a registered Professional Engineer or registered Land Surveyor. This plan must show existing grades on the parcel of land, together with proposed grades at the conclusion of the operation. The plan shall provide for proper drainage of the area during and after the period of operation and for restoration of the site upon completion of the operation.
    2. In all districts, every slope and bank above or below natural grade must be prepared at the end of each working day so that it does not exceed one (1) foot of vertical distance in each two (2) feet of horizontal distance.
    3. The Board of Appeals shall impose such additional conditions as may in its judgment be for the protection of health, safety, and welfare of the inhabitants of the Town. Such conditions may include, but not be limited to, restrictions on use of roads and routing of vehicles; hours of operation; storage of operating equipment; restrictions on impoundment of water and slopes of banks; minimum distance of operation from any residential lot line; fences, streams and other safety measures required during this period of operation, and the restoration of the area where necessary.
    4. The Building Inspector or other agent designated by the Board of Appeals shall inspect each operation at least once a month or as otherwise required,

and report on his inspection to the Board of Appeals. The cost to the Town of such inspections shall be billed to and paid for by the holder of the permit.

5. Before endorsement of approval of any plan under Section 7.8., the Board of Appeals may require the petitioner to contract with the Town of Hampden, to complete all the requirements as set forth by the Board, such completion to be secured by the petitioner either filing a performance bond or a deposit of money or negotiable securities in an amount determined by the Board of Appeals, to be sufficient to cover the cost of all or any part of the requirements specified by the Board of Appeals. Such bond or security, if filed or deposited, shall be approved as to form and manner of execution by the Town Counsel and as to securities by the Town Treasurer and shall be contingent on the completion of such requirements within one (1) year of the date of such bond.
6. Earth Removal Permits shall be issued for a period not to exceed one year. A public hearing shall be held before a permit is renewed by the Board of Appeals.

Section 10: Special Permits, Special Permits with Site Plan Approval, and Site Plan Review – Administrative Review

10.5 Application Requirements for Special Permit

5. Existing and proposed topography at a two foot contour interval, the location of wetlands, streams, waterbodies, drainage swales, areas subject to flooding and base flood elevations and unique natural land features;

8. The location and description of all proposed septic systems, percolation tests when necessary, water supply, storm drainage systems including existing and proposed drainlines, culverts, drainage swales, catchbasins, utilities, hydrants, manholes and lighting fixtures;

9. Drainage calculations and subdrainage along with soil logs;

10.6 Application Requirements for Special Permit with Site Plan Approval or Site Plan Review

5. A plan for the control of erosion, dust and silt, both during and after construction, temporary and permanent erosion control, and protection of water bodies is required.

10.7 Procedures for Review of Special Permits and Site Plans

6. Special Permit with Site Plan Approval and Site Plan Review Criteria

(4) The proposed development, to the extent feasible:

(a) is integrated into the existing landscape and protects abutting properties;

(b) minimizes adverse environmental impacts on such features as wetlands, floodplains, and aquifer recharge areas;

(c) minimizes obstruction of scenic views from publicly accessible locations;

(d) preserves unique natural or historical features;

(e) minimizes tree, vegetation and soil removal and grade changes;

(f) maximizes open space retention; and

(g) screens objectionable features from neighboring properties and roadways.

(7) The site plan shows adequate measures to prevent pollution of surface or groundwater to minimize erosion and sedimentation, minimize changes in groundwater levels, and assure no increase in run-off or potential for flooding.

10.8 Criteria - Special Permit and Special Permit with Site Plan Approval

10. The proposed project shall not create a significant adverse impact to the quality of surface water or groundwater during and after construction, and provision shall be made for ensuring groundwater recharge.

Subdivision of Land

Hampden's most recent draft of its Subdivision Rules and Regulations chapter was adopted for the purpose of "protecting the safety, convenience and welfare of the inhabitants of the cities and towns in which it is, or may hereafter be, put in effect by regulating the laying out and construction of ways in subdivisions providing access to the several lots therein, but which have not become public ways, and ensuring sanitary conditions in subdivisions and in proper cases parks and open areas."

The subdivision regulations contain several provisions that mitigate the potential for, and impact of, flooding. Procedural standards request Environmental Impact Statements to address flooding and other water, natural features, and drainage concerns. In addition, the Design Standards regulate specifics regarding street location and drainage, protection of natural features, and sediment control.

Section 4: Procedure for the Submission and Approval of Plans

4.3 Definitive Plan

2. Contents

p. Location of base flood elevation if encountered within 100' of the subdivision.

5. Environmental Impact Statement

The applicant shall submit six (6) copies of an environmental impact study, the purpose of which is to enable the officials of the Town to determine what methods are to be used by the applicant to promote the environmental health of the community and to minimize adverse effects on the natural resources of the Town. This statement will also address the economic impact resulting to the Town as the result of the development, as well as its effects on Town demographics and traffic during and after construction. The statement shall be a technical document with references for all statements whenever possible.

In reviewing the statement, the Town boards, department heads and other officials will consider the degree to which water is recycled back into the ground, the maintenance and improvement of the flow and quality of surface waters, historic sites, unique geological, botanical, zoological, and archaeological features, existing or potential trails and accesses to open space area, impact on local traffic & adjacent streets, proposed land management, and the health and safety of the inhabitants of the area.

The Environmental Impact Statement shall contain the following:

b. Surface Water and Soils:

1. Description of the location, extent and type of existing water and wetlands, including existing surface drainage characteristics, both within and adjacent to the project;

2. Description of the methods to be used during construction to control erosion and sedimentation; *i.e.*, use of sediment basins and type of mulching, matting or temporary vegetation; description of approximate size and location of land to be cleared at any given time and length of time of exposure; covering of soil stockpiles and other control methods to be used;

3. Evaluation of the effectiveness of the proposed methods on the site and on the surrounding areas;

4. Description of the permanent methods to be used to control erosion and sedimentation. This description shall include a description of:

(a) Any areas subject to flooding or ponding;
(b) Proposed surface drainage system, per Section 5.5;
(c) Proposed land grading and permanent vegetation cover;
(d) Methods to be used to protect existing vegetation;
(e) The relationship of the development to the topography;
(f) Any proposed alterations of shore lines, marshes or seasonal wet areas;
(g) Any existing or proposed flood control or wetland easements;
(h) Estimated increase of peals run-off caused by altered surface conditions and methods to be used to return water to the soils.

5. Complete description of the sewage disposal methods.

6. Evaluation of the impact of the disposal methods on surface water, soils and vegetation

Section 5: Design Standards

5.1 Streets

1. Location and Alignment

All streets in the subdivision shall be designed so that, in the opinion of the Board, they will provide safe vehicular travel. Due consideration shall also be given by the subdivider to the following features:

1. Volume of cut and fill;
2. Area over which existing vegetation will be disturbed, especially if within 200 feet of a river, wetland or waterbody, or in areas having a slope of more than 15%;
3. Number of trees removed having a diameter over six inches (6");
4. Extent of waterways altered or relocated;
5. Dimensions of paved areas (including streets) except as necessary to safety and convenience, especially in aquifer/recharge areas;
8. Maintenance within the subdivision of runoff and vegetative cover equivalent to conditions before development.

5.3 Protection of Natural Features

All natural features, such as trees, wooded areas, water courses, scenic points, historic spots shall be preserved as much as possible. Any clearance, backfilling, cutting, thinning or other disturbance to trees six (6) inches or over in diameter, measured four feet above

finished ground level (dbh), located within the unpaved portions of the right-of-way, or other natural vegetation shall be prohibited unless deemed proper by the Board. Any such proposed clearance shall be shown on the plan, and written reasons therefore may be required by the Board. Trees, wells or retaining walls should be installed when and as requested by the Board for suitable grading around trees.

5.4 Sediment Control

In order to reduce erosion accompanying the installation of ways, utilities and drainage, and the resultant pollution of streams, wetlands and natural drainage areas, the applicant shall submit a sediment control plan, including control methods such as berms, dikes, detention ponds, mulching and temporary sodding.

Stormwater Management

Hampden adopted a separate Stormwater Management Bylaw in order to deal with erosion and pollutants impacting the rivers and streams in town. Managing stormwater is also a component of mitigating flooding.

Chapter XIV: Stormwater Management

1. Purpose

The purpose of this chapter is to eliminate non-stormwater discharges to the Town of Hampden's Municipal Storm Drain System. Non-stormwater discharges contain contaminants and supply additional flows to the Town of Hampden's Storm Drain System. Non-stormwater discharges are major causes of:

a. impairment of water quality and flow in lakes, ponds, streams, rivers, wetlands, and groundwater;
b. contamination of drinking water supplies;
c. alteration or destruction of aquatic and wildlife habitat; and
d. flooding.

Regulation of illicit connections and discharges to the storm drain system is necessary for the protection of the Town of Hampden's, natural resources, municipal facilities, general health, safety, welfare, and the environment. The objectives of this section are:

a. to prevent pollutants from entering the storm drain;
b. to prohibit illicit connections and unauthorized discharges to the storm drain
c. to remove all such illicit connections;
d. to comply with state and federal statutes and regulations relating to stormwater discharges; and
e. to establish the legal authority to ensure compliance with the provisions of this section through inspection, monitoring, and enforcement.

3. Applicability

This section shall apply to flows entering the municipally owned and/or operated storm drainage system.

7. Prohibited Activities

a. Illicit Discharges - No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the storm drain system, into a watercourse, or into waters of the United States and/or Commonwealth.
b. Illicit Connections - No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.
c. Obstruction Of The Municipal Storm Drain System - No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior approval from the Board of Selectmen.
d. Exemptions
    1. Discharge of flow resulting from fire fighting activities and Highway Department ice and snow control operations.
    2. The following non-stormwater discharges or flows are considered exempt provided that the source is not a significant contributor of pollution to the municipal storm drain system:
        i. waterline flushing;
        ii. flow from potable water sources;
        iii. springs;
        iv. natural flow from riparian habitats and wetlands;
        v. diverted stream flow;
        vi. rising groundwater;
        viii. uncontaminated groundwater infiltrating as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater; water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air conditioning condensation;
        ix. discharge from landscape irrigation or lawn watering;
        x. water from individual residential car washing;
        xi. discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance;
        xii. discharge from street sweeping;
        xiii. dye testing, provided verbal notification is given to the Board of Selectmen prior to the time of the test;
        xiv. non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations; and
        xv. discharge for which advanced written approval is received from the Board of Selectmen as necessary to protect public health, safety, welfare, and the environment.

9. Notification of Spills

Any spills or releases that require notification under local, state or federal law will be the responsibility of the person responsible for a facility or operation, or for an emergency response for a facility or operation (*i.e.*, construction). In the event of a spill or release which may result in a discharge of pollutants or non-stormwater discharge to the municipal storm drain system, waters of the United States, and/or waters of the Commonwealth, the responsible parties, potentially responsible parties, or any person or persons managing a site or facility shall take all necessary steps to ensure containment, and remediate any municipal storm drains that have been impacted. However, if in the opinion of Board of Selectmen, there is an excessive amount of pollutants in the storm drain system, the Board of Selectmen can require remediation by the responsible party regardless of other state or federal regulations. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall take all necessary steps to ensure containment, clean-up of the release, retain on-site a written record of the discharge, and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

Hampden Open Space and Recreation Plan

In 2006, the Town of Hampden updated its Open Space and Recreation Plan. The intent of the document is not to address hazard mitigation or flood control in a direct or comprehensive way; however, the Open Space and Recreation Plan inventories the natural features and environments in the town, many of which, such as wetlands, groundwater recharge areas, farms, rivers, streams, and brooks, contain floodplain, dam failure inundation, or localized flooding areas.

The plan highlights the importance of balancing future development with the preservation of the community's natural and scenic resources. The preservation of open space and farmland will provide flood storage capacity, which reduces the amount of impervious surfaces in an area, as well as other benefits not directly related to natural hazard mitigation.

Two of the plan's Action Items are especially relevant to flood hazard mitigation:

- Insist on strict enforcement of existing bylaws. Adhere to strict enforcement of Title 5.
- Continue to pursue acquisition of all wetlands within new subdivisions in order to preserve their vital functions of pollution control and flood storage.

National Flood Insurance Program

The Town of Hampden participates in the National Flood Insurance Program. As of 2006, there were 26 policies in effect in Hampden, for a total of $3,847,900 worth of insurance. The town is not a member of the Community Rating System, which entitles policyholders to a discount on flood insurance premiums. The CRS ranking is based on the steps that a town has taken to control flood losses.

The Community Rating System reduces flood insurance premiums to reflect what a community does above and beyond the National Flood Insurance Program's (NFIP) minimum standards for floodplain regulation. The objective of the CRS is to reward communities for what they are

doing, as well as to provide an incentive for new flood protection activities. To participate in the CRS, a community must fill out an application and submit documentation that shows what it is doing and that its activities deserve at least 500 points. More information including instructions and applications is available at *http://training.fema.gov/EMIWeb/CRS/m3s1main.htm*

Table 5-1: Existing Flood Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Culvert Replacements	Priority list of necessary culvert replacements and other construction projects to effectively manage flooding.	Entire town.	Very effective for managing flood control needs.	Replace top priorities on culvert replacement list to reduce flooding, pending availability of funding.
Zoning By-Laws				
Floodplain and Wetlands District	Areas delineated as part of the 100-year floodplain and wetlands are protected by strict use regulations.	100-year flood plain, area around river, wetlands	Very effective for preventing incompatible development within the flood prone areas.	
Water Supply Protection District	Areas delineated as recharge areas for groundwater aquifers are protected by strict use regulations.	Groundwater recharge areas	Very effective for preventing groundwater contamination and for controlling stormwater runoff.	Revise definitions for clarification – utilize state model from DEP.
Golf and Recreation District	Definitive plan must show drainage and runoff	Areas zoned as GR		
Non-Profit Educational Recreation District	Minimum 75% open space; drainage requirements; site and definitive plan must show runoff and drainage	Areas zoned as N-PER		
Special Permits/Site Plan Approval	Proposed uses must meet requirements for drainage and preventing erosion and pollution to waterbodies.	Where special permit needed.	Effective for preventing incompatible development.	

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Subdivision Regulations				
Procedural Requirements	Definitive plan must include Environmental Impact Statement	All subdivisions	Somewhat effective at protecting water bodies and other features.	Clarify requirements and responsibilities of operation and maintenance.
Design Standards	Streets – locations must consider proximity to waterbodies Protection of Natural Features Sediment Control	All subdivisions	Effective at protecting water bodies and other natural features	
Stormwater Management (proposed)	Strict regulations for illicit connects to municipal storm drain systems; reporting of spills	Entire town.	Effective at protecting water bodies, reducing flow during storm events.	Propose adoption.
Hampden Open Space and Recreation Plan	Inventories natural features and promotes natural resource preservation in the town, including areas in the floodplain; such as wetlands, groundwater recharge areas, farms and open space, rivers, streams and brooks.	Entire town.	Effective in identifying sensitive resource areas, including floodplains. Encourages forestland and farmland protection, which will help conserve the town's flood storage capacity.	Implement relevant action items in OSRP.
Participation in the National Flood Insurance Program	As of 2006, there were 26 homeowners with flood insurance policies.	Areas identified by the FEMA maps.	Somewhat effective, provided that the town remains enrolled in the National Flood Insurance	Initiate process to become a part of FEMA's Community Rating System. Distribute information to

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
			Program.	citizens living in floodplain about NFIP.

Severe Snowstorms/Ice Storms

Winter storms can be especially challenging for emergency management personnel. Even though the storm has usually been forecast, there is no certain way for predicting its length, size or severity. The Massachusetts Emergency Management Agency (MEMA) serves as the primary coordinating entity in the statewide management of all types of winter storms and monitors the National Weather Service (NWS) alerting systems during periods when winter storms are expected.

To the extent that some of the damages from a winter storm can be caused by flooding, all of the flood protection mitigation measures described in Table 5-1 in the previous section can also be considered as mitigation measures for severe snowstorms/ice storms.

Management Plans[12]

The CEM Plan for Hampden lists the following generic mitigation measures for severe winter storms:

1. Develop and disseminate emergency public information concerning winter storms, especially material which instructs individuals and families how to stock their homes, prepare their vehicles, and take care of themselves during a severe winter storm.
2. Local governments should assume that winter will occur annually and budget fiscal resources with snow management in mind.
3. As it is almost guaranteed that winter storms will occur annually in Massachusetts, local government bodies should give special consideration to budgeting fiscal resources with snow management in mind.
4. Maintain plans for managing all winter storm emergency response activities.

The CEM Plan for Hampden lists the following generic preparedness and response measures for severe winter storms:

1. Ensure that warning/notification, and communications systems are in readiness.
2. Ensure that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order.
3. Review mutual aid agreements.
4. Designate suitable shelters throughout the community and make their locations known to the public.
5. Implement public information procedures during storm ‘warning’ stage.
6. Prepare for possible evacuation and sheltering of some populations impacted by the storm (especially the elderly and special needs).
7. Broadcast storm warning/notification information and instructions.
8. Conduct evacuation, reception and sheltering activities.

9. If appropriate, activate media center. Refer to Resource Manual (Core Functions) for media center information.
10. Dispatch search and rescue teams.
11. Dispatch emergency medical teams.
12. Take measures to guard against further danger from power failure, downed trees and utility lines, ice, traffic problems, etc.
13. Close roads, and/or limit access to certain areas if appropriate.
14. Provide assistance to homebound populations needing heat, food, and other necessities.
15. Provide rescue and sheltering for stranded/lost individuals.

Restrictions on Development

There are no restrictions on development that are directly related to severe winter storms. However, the Town of Hampden's Bylaws set grade limits on streets, and restrictions on utility placement, which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe winter storms:

Zoning Bylaw

Section 6: Use Regulations

6.2 The R-4 District

j. All proposed utilities shall be installed underground at the time of the initial construction.

6.7 The Golf Recreational District

a. All proposed utilities shall be installed underground at the time of the initial construction.

6.8 Non-Profit Educational and Recreational District

a. All proposed utilities shall be installed underground at the time of the initial construction.

6.10 Ridgeline and Hillside Overlay District

6.a. Utilities shall be constructed and routed underground except in those situations where natural features prevent the underground siting or where safety considerations necessitate above ground construction and routing. The Review Board may waive this requirement.

Section 7: Development of Sites and Location of Buildings and Structures

7.13 Planned Unit Residential Development (PURD)

1. Each dwelling in a PURD shall be provided with access, drainage and utilities that are functionally equivalent to that provided under the Planning Board's Subdivision Regulations. All utilities shall be placed underground.

7.7 Development and Performance Standards

11. Utilities

Electric, telecommunications, and other such utilities shall be underground where physically and environmentally feasible.

Section 10: Special Permits, Special Permits with Site Plan Approval, and Site Plan Review

10.7 Procedures for Review of Special Permits and Site Plans

6. Special Permit with Site Plan Approval and Site Plan Review Criteria

(9) Electric lines, telecommunications lines and other such utilities shall be underground.

Subdivision Regulations

Section 5: Design Standards

3. Grade

a. Grades of streets shall be not less than 0.5%. Grades shall not be more than 6% for primary collector streets, nor more than 8% for secondary collector streets, minor roads or streets.

b. Where the grade of any street at the approach to an intersection exceeds three percent (3.0%) a leveling area shall be provided having not greater than three percent (3.0%) grades for a distance of fifty (50) feet measured from the nearest right of way line of the intersecting street.

State Building Code

For new or recently built structures, the primary protection against snow-related damage is construction according to the State Building Code, which addresses designing buildings to withstand snowloads. The Town of Hampden currently employs a building inspector to ensure that construction meets state standards.

Other Mitigation Measures

The town works throughout the year to accumulate a list of dangerous trees and tree limbs for Western Mass Electric Company (WMECO) to take down annually. This collaborative system allows the town to rely on WMECO to help with tree management, and WMECO to stay current on the status of its power line network.

Severe snowstorms or ice storms can often result in a small or widespread loss of electrical service. The Hampden Town Offices, Thornton Burgess School, Green Meadow School, and Mary-Lyon Nursing Home, all designated shelters in case of emergency, have generators. In addition, the Hampden Highway Department operates three mobile generator units, able to be utilized in case of power outages.

Table 5-2: Existing Severe Snowstorms/Ice Storms Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Use Regulations	Utilities must be placed underground.	Zone districts: R-4, GR, N-PER, Ridgeline and Hillside Overlay	Effective for preventing power loss.	Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.
Development of Sites		PURD zone district		
Development and Performance Standards		Entire town.		
Special Permit and Site Plan Approval		Where site plan approval needed.		
Design Standards (Subdivision Regs)	Standards include street grade regulations (6% - 8% maximum); and intersection grade regulations.	Entire town.	Effective.	None.
State Building Code	The Town of Hampden has adopted the Massachusetts State Building Code.	Entire town.	Effective.	None.
Backup Electric Power	Shelters have backup power, three mobile generators	Shelters; entire town.	Very effective in case of power loss.	Test effectiveness of generators.
Tree Management	List of dangerous trees created annually for WMECO.	Entire town.	Very effective, preventative collaboration.	None.

Hurricanes/Severe Wind

Of all the natural disasters that could potentially impact Hampden, hurricanes provide the most lead warning time because of the relative ease in predicting the storm's track and potential landfall. MEMA assumes "standby status" when a hurricane's location is 35 degrees North Latitude (Cape Hatteras) and "alert status" when the storm reaches 40 degrees north Latitude (Long Island).

The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore, all of the flood protection mitigation measures described in Table 5-1 can also be considered hurricane mitigation measures. High winds that oftentimes accompany hurricanes can also damage buildings and infrastructure.

Town of Hampden's land development standards and State Building Code regulations, as listed below, are equally applicable to wind events such as hurricanes and tornadoes.

Management Plans[12]

The CEM Plan for Hampden includes the following generic mitigation measures for hurricane planning and response:

1. Develop and disseminate emergency public information and instructions concerning hurricane preparedness and safety.
2. Community leaders should ensure that Hampden is enrolled in the National Flood Insurance Program.
3. Develop and enforce local building codes to enhance structural resistance to high winds and flooding. Build new construction in areas that are not vulnerable to direct hurricane effects.
4. Make informed decisions concerning protecting natural attributes such as beaches and dunes with breakwaters and seawalls. Review National Flood Insurance Rate Maps and Hurricane Evacuation Maps for possible impact on the community.
5. Maintain plans for managing all hurricane emergency response activities.

The CEM Plan for Hampden includes the following generic preparedness and response measures for hurricanes:

1. Ensure that warning/notification systems and equipment is ready for use at the 'hurricane warning' stage.
2. Review mutual aid agreements.
3. Designate suitable wind and flood resistant shelters in the community and make their locations known to the public.
4. Prepare for coordination of evacuation from potentially impacted areas including alternate transportation systems and locations of special needs facilities.

5. Activate warning/notification systems to inform public of protective measures to be taken including evacuation where appropriate.
6. Conduct evacuation of affected populations.
7. Open and staff shelters and reception centers.
8. Dispatch search and rescue teams.
9. Dispatch emergency medical teams.
10. Activate mutual aid activities.
11. Take measures to guard against further danger from downed trees and utility lines, debris, etc.
12. Refer to Resource Manual (Core Function) for information regarding transportation providers.

Land Development Regulations

There are no restrictions on development that are directly related to hurricanes. However, the Town of Hampden's Land Development Ordinance does have some provisions that are wind-related, specifically, zoning bylaws related to wireless communications facilities and mobile home parks. In addition, the Ordinance sets restrictions on utility placement, which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe wind. (See previous section.)

Section 7: Development of Sites and Location of Buildings and Structures

7.11 Trailers

No trailer or mobile home as defined in Section 2 of this by-law shall be permitted in any district, except as provided below.

1. The Building Commissioner may grant a permit for temporary parking of a construction trailer at the site of any approved construction project.

2. Travel or camping trailers owned or rented by the owner or resident only of the property may be stored upon the premises. Such travel or camping trailer shall not be used for living purposes, except when a residence has been destroyed as described in M.G.L., Ch 40A, Section 3.

7.14 Wireless Communications Bylaw

A. Wireless Communication Facility Other than a Tower

1. No facility shall project more than ten feet above the existing roof line of the building, or more than ten feet above the top of the existing structure upon which it is mounted, or more than five feet out from the plane of the existing wall or facade to which it is attached, provided that such projections do not otherwise violate existing yard dimensions or set-back requirements.

B. Wireless Communication Facility Tower

3. All towers shall be located a minimum of 250 feet from the nearest residential structure.

4. Tower height shall not exceed one hundred fifty feet above mean grade at existing terrain.
6. The base of the tower shall be a distance of at least equal to the tower's height from any property line.

State Building Code

For new or recently built structures, the primary protection against wind-related damage is construction that adheres to the State Building Code, which, when followed, results in buildings that withstand high winds. The Town of Hampden currently employs a building inspector to ensure that construction meets state standards.

Tornadoes/Microbursts

Worcester County and areas just to its west, including portions of Hampden County, have been dubbed the "tornado alley" of the state because the majority of significant tornadoes in Massachusetts's weather history have occurred in that region. According to the *Institute for Business and Home Safety,* the wind speeds in most tornadoes are at or below design speeds that are used in current building codes.[13] Like earthquakes, the location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail.

Management Plans[12]

The CEM Plan for Hampden includes the following generic mitigation measures for tornado planning and response:

1. Develop and disseminate emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures, and locations of public shelters.
2. Strict adherence should be paid to building code regulations for all new construction.
3. Maintain plans for managing tornado response activities. Refer to the non-institutionalized, special needs and transportation resources listed in the Resource Manual (Core Function, and Vulnerable Populations and Areas).

The CEM Plan for Hampden includes the following generic preparedness and response measures for tornadoes:

1. Designate appropriate shelter space in the community that could potentially withstand tornado impact.
2. Periodically test and exercise tornado response plans.
3. Put Emergency Management on standby at tornado 'watch' stage.

[13] *www.ibhs.org.*

4. At tornado ‘warning’ stage, broadcast public warning/notification safety instructions and status reports.
5. Conduct evacuation, reception, and sheltering services to victims.
6. Dispatch search and rescue teams.
7. Dispatch emergency medical teams.
8. Activate mutual aid agreements.
9. Take measures to guard against further injury from such dangers as ruptured gas lines, downed trees and utility lines, debris, etc.
10. Acquire needed emergency food, water, fuel, and medical supplies.
11. Take measures relating to the identification and disposition of remains of the deceased.

Table 5-3: Existing Hurricane and Tornado Hazard Mitigation Measures (Wind-Related)

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Use Regulations	Utilities must be placed underground.	Zone districts: R-4, GR, N-PER, Ridgeline and Hillside Overlay	Effective for preventing power loss.	Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.
Development of Sites		PURD zone district		
Development and Performance Standards		Entire town.		
Special Permit and Site Plan Approval		Where site plan approval needed.		
Wireless Communications Bylaw	Height and setback limits on wireless communication towers/facilities	Entire town.	Somewhat effective for preventing damage to nearby property	None.
Development of Sites: Trailers	Trailers (or mobile homes/RVs) are not permitted within town limits as permanent living quarters.	Entire town	Somewhat effective for preventing damage to susceptible structures (mobile homes).	None.
State Building Code	The Town has adopted the MA State Building Code.	Entire town.	Effective.	None.
Tree Management	List of dangerous trees created annually for WMECO.	Entire town.	Very effective, preventative collaboration.	None.

Wildfires/Brushfires

Hampshire County has approximately 252,000 acres of forested land, which accounts for 72 percent of total land area. Forest fires are therefore a potentially significant issue. In Hampden, approximately 69 percent of the town's total land area is in forest, or about 8,670 acres, and is therefore at risk of fire. According to Hampden Fire Department, there are approximately 12 unauthorized fires reported in Hampden per year.

Management Plans[12]

The Hampden CEM Plan includes the following generic mitigation, preparedness, and response measures for urban/wild fires. It is assumed these can also apply to brushfires.

1. Promote fire safety measures such as fire-safe landscaping and construction practices to the public and business communities.
2. Restrict outside burning, etc., based on moisture levels, fuel supply, conditions such as drought.
3. Identify high vulnerability or problem areas.
4. Utilize mutual aid, including the State Fire Mobilization Plan, as needed.

Land Development Standards

There are currently no restrictions on development that are based on the need to mitigate the hazards of wildfires/brushfires. However, there are several instances throughout the Zoning By-Laws and Subdivision Regulations where fire prevention is addressed. The relevant section from the Subdivision Regulations is included here, regarding rural fire hydrant water supply.

Section 5 Design Standards

5.7 Utilities and Municipal Services

2. Water Supply

a. Rural Fire Hydrants. Compliance with the requirements of the Standard on Water Supplies for Suburban and Rural Firefighting, National Fire Protection Association, standard 1231, and the requirements of the Fire Department shall be satisfied. For a subdivision containing five (5) building lots or more, the construction of a ten thousand (10,000) gallon capacity static or residual supply may be required if so required by the Fire Department, except whenever a suitable natural source, as determined by the Fire Department, may exist within one thousand five hundred (1500) feet of the subdivision.

Regulatory Measures

Burn Permits

Burn permits for the Town of Hampden are issued by the Hampden Fire Department (or the Police Department on weekends or holidays). According to the Fire Department, approximately 1,000 permits are issued annually. During this process, the applicant is provided guidelines for

when and where the burn may be conducted as well as fire safety tips and woodstove installation guidelines.

Public Education/Outreach

The Hampden Fire Department facilitates a S.A.F.E. (Student Awareness of Fire Education) program, and provides fire prevention education at all schools in Hampden. Field trips to the station are available for groups like Boy or Girl Scout Troops, by appointment. In addition, the Fire Department also issues press releases notifying the public about the start and end of burning season.

Table 5-4: Existing Wildfire/Brushfire Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Subdivision Regulations: Rural Water Supply	Subdivisions greater than 5 are encouraged to provide a water source for fire prevention.	Entire town.	Effective.	Make requirement mandatory.
Burn Permits	Residents must obtain burn permits, and personnel provide information on safe burn practices.	Entire town.	Somewhat effective.	Increase enforcement of burning regulations, perhaps invoke penalties for offenders.
Public Education/ Outreach	The Fire Department has an ongoing educational program in the schools.	Entire town.	Effective.	None.

Earthquakes

Although there are five mapped seismological faults in Massachusetts, there is no discernable pattern of previous earthquakes along these faults nor is there a reliable way to predict future earthquakes along these faults or in any other areas of the state. Consequently, earthquakes are arguably the most difficult natural hazard to plan for. Most buildings and structures in the state were constructed without specific earthquake resistant design features.

In addition, earthquakes precipitate several potential devastating secondary effects such as building collapse, utility pipeline rupture, water contamination, and extended power outages. Therefore, many of the mitigation efforts for other natural hazards identified in this plan may be applicable during the Town's recovery from an earthquake.

Management Plans

The Hampden CEM Plan lists the following generic mitigation measures for earthquakes:

1. Community leaders in cooperation with Emergency Management Personnel should obtain local geological information and identify and assess structures and land areas that are especially vulnerable to earthquake impact and define methods to minimize the risk.
2. Strict adherence should be paid to land use and earthquake resistant building codes for all new construction.
3. Periodic evaluation, repair, and/or improvement should be made to older public structures.
4. Emergency earthquake public information and instructions should be developed and disseminated.
5. Earthquake drills should be held in schools, businesses, special care facilities, and other public gathering places.

The Hampden CEM Plan lists the following generic preparedness and response measures for earthquakes:

1. Earthquake response plans should be maintained and ready for immediate use.
2. All equipment, supplies and facilities that would be needed for management of an earthquake occurrence should be maintained for readiness.
3. Emergency Management personnel should receive periodic training in earthquake response.
4. If the designated Emergency Operations Center (EOC) is in a building that would probably not withstand earthquake impact, another building should be chosen for an earthquake EOC.
5. Mass Care shelters for earthquake victims should be pre-designated in structures that would be most likely to withstand earthquake impact. See the Resource Manual (Core Functions) for Mass Care Shelters.

6. It is assumed that all special needs facilities could be affected to some extent by earthquake effects therefore preparedness measures should be in place to address the needs of all facilities listed in the Resource Manual (Vulnerable Populations and Areas).
7. Most likely the entire population of the community will be affected by a seismic event. Estimate the maximum peak population affected, considering peak tourism, special event populations, and work hours.
8. EOC will be activated and response will immediately be engaged to address any and all earthquake effects listed.
9. Emergency warning/notification information and instructions will be broadcast to the public.
10. Search and rescue teams will be dispatched.
11. Emergency medical teams will be dispatched.
12. Firefighters will address fires/explosions, and HAZMAT incidents.
13. Law enforcement personnel will coordinate evacuation and traffic control.
14. Reception centers and shelters will be opened and staffed.
15. Animal control measures will be taken.
16. Law enforcement personnel will protect critical facilities and conduct surveillance against criminal activities.
17. Immediate life-threatening hazards will be addressed such as broken gas lines, downed utility wires, and fire control resources.
18. Emergency food, water, and fuel will be acquired.
19. Activate mutual aid.
20. Measures will be taken relating to identification and disposition of remains of deceased by the Chief Medical Examiner.

State Building Code

State and local building inspectors are guided by regulations put forth in the Massachusetts State Building Code. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975 and included specific earthquake resistant design standards. These seismic requirements for new construction have been revised and updated over the years and are part of the current, 6th Edition of the Massachusetts State Building Code. Given that most structures in Massachusetts were built before 1975, many buildings and structures do not have specific earthquake resistant design features. According to the 2000 U.S. Census, 36% of the housing in Hampden was built before 1970. In addition, built areas underlain by artificial fill, sandy or clay soils are particularly vulnerable to damage during an earthquake.

Restrictions on Development

There are no seismic-related restrictions on development.

Table 5-5: Existing Earthquake Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
State Building Code	The Town of Hampden has adopted the State Building Code.	Entire town but applies to new construction only.	Effective for new buildings only.	Determine whether older structures categorized as critical facilities to determine if they are earthquake resistant.

Dam Failures

Dam failure is a highly infrequent occurrence, but a severe incident could prove catastrophic. The only mitigation measures in place for dams are the state regulations that control their construction and inspection.

Management Plans and Regulatory Measures

The Hampden CEM Plan states that there are three categories of dam failure or overspill and that action should be taken according to hazard rating:

Type 1: Slowly Developing Condition

1. Activate EOC
2. Activate all communication networks and establish 24-hour communications with Command Post on a 24-hour basis.
3. Release public information
4. Notify:
    - MEMA Region Headquarters
    - American Red Cross
    - Downstream communities
5. Review Plans for evacuation and sheltering
    a. Evacuation
        - routes
        - notification
    b. Shelter
        - availability and capacity
        - food, supplies, and equipment
        - shelter owners and managers
        - other communities (if out of town sheltering is required)
6. Require "Stand By" status of designated emergency response forces.

Type 2: Rapidly Developing Condition

1. Establish a 24-hour communications from dam site to EOC.
2. Assemble, brief and assign specific responsibilities to emergency response forces.
3. Release public information.
4. Obtain and prepare required vehicles/equipment for movement.
5. Prepare to issue warning.

Type 3: Practically Instantaneous Failure

1. Issue warning
2. Commence immediate evacuation.
3. Commit required resources to support evacuation.
4. Activate shelters or coordinate activation of shelters located outside the community.
5. Notify:
    - MEMA Region Headquarters
    - Red Cross
6. Initiate other measures as required to protect lives and property.

The Hampden CEM Plan contains the following generic mitigation measures for dam failure:

1. Develop and conduct public education programs concerning dam hazards.
2. Maintain up-to-date plans to deal with threat and actual occurrence of dam over-spill or failure.
3. Emergency Management and other local government agencies should familiarize themselves with technical data and other information pertinent to the dams, which impact their jurisdiction. This should include determining the probable extent and seriousness of the effect to downstream areas.
4. Dams should be inspected periodically and monitored regularly.
5. Repairs should be attended to promptly.
6. As much as is possible burdens on faulty dams should be lessened through stream re-channeling.
7. Identify dam owners.
8. Determine minimum notification time for down stream areas.

The Hampden CEM Plan contains the following generic preparedness and response measures for dam failure:

1. Pre-place adequate warning/notification systems in areas potentially vulnerable to dam failure impact.
2. Pre-place procedures for monitoring dam site conditions at first sign of any irregularity that could precipitate dam failure.
3. Identify special needs populations, evacuations routes, and shelters for dam failure response.
4. Have sandbags, sand, and other items to reinforce dam structure or flood proof flood prone areas.
5. Disseminate warning/notification of imminent or occurring dam failure.
6. Coordinate evacuation and sheltering of affected populations.
7. Dispatch search and rescue teams.

8. Coordinate evacuation and sheltering of affected populations.
9. Activate mutual aid if needed.
10. Acquire additional needed supplies not already in place, such as earth moving machinery.
11. Establish incident command post as close to affected area as safely possible.
12. Provide security for evacuated public and private property.
13. Refer to Resource Manual (Core Functions) for information regarding transportation providers.

Permits Required for New Dam Construction

Massachusetts State Law (M.G.L. Chapter 253 Section 45) regulates the construction of new dams. A permit must be obtained from the Department of Conservation and Recreation (DCR) before construction can begin. One of the permit requirements is that all local approvals or permits must be obtained.

Dam Inspections

The DCR requires that dams rated as Low Hazards are inspected every ten (10) years, dams that are rated as Medium/Significant Hazards are inspected every five (5) years, and dams that a rated as High Hazards are inspected every two (2) years. This is the responsibility of the dam owner.

Restrictions on Development

There is no mention made regarding the construction of new dams in the Town of Hampden zoning or subdivision regulations, although alterations to watercourses, including streams, brooks, ponds, and wetlands is highly restricted through the Chapter 450: Wetlands Conservation regulations, and enforced further through the Town's Floodplain and Wetlands District.

The DCR issues permits for new dams and does have the authority to deny a permit if it is determined that the design and/or location of the dam is not acceptable.

Table 5-6: Existing Dam Failure Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
New Dam Construction Permits	State law requires a permit for the construction of any dam.	Entire town.	Effective. Ensures dams are adequately designed.	None.
Dam Inspections	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Entire town.	Low. The responsibility for this is now on dam owners, who may not have sufficient funding to comply. Monitoring and enforcement falls within the state's purview.	Identify sources of funding for dam safety inspections. Incorporate dam safety into development review process.

Drought

Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. And unlike other places, drought can most likely be effectively mitigated in regions like the Pioneer Valley if measures are put into place. Hampden has several water protection regulations in place, as evidenced in the section on flooding. Additional regulations and mitigation options, specific to drought mitigation, are included here.

Management Plans[12]

The Hampden CEM Plan includes the following mitigation, preparedness, and response measures:

1. Seeks to balance demand on water supply through land use, zoning, and other tools.
2. Encourages water conservation and water control measures to ease demand on water supply.
3. Improves efficiency and capacity of the water supply system, including leak detection and repair.
4. Identifies potential emergency water sources, such as purchase form adjoining communities, if available.
5. Keeps abreast of drought forecasts issued by the State Drought Task Force.
6. Encourages businesses and other bulk users to develop water conservation and shortage plans.
7. Implements water use controls as needed.
8. Coordinates requests for potable water in emergency situations.

Land Development Regulations

Hampden's Zoning Bylaw and Subdivision Regulations have several sections governing flood and stormwater management, proper drainage, and ground and surface water protection. The by-laws protecting these features of the landscape can also be seen as preventing drought, as they promote the natural processes of infiltration and groundwater recharge. (See language in Flood section, above.)

Hampden Open Space and Recreation Plan

Water is a main focus of Hampden's Open Space and Recreation Plan, and it serves as an excellent resource as an inventory of all the town's water resources, and a summary of the town's needs to protect them. It also articulates the town's goals and vision for protecting and utilizing its water resources most effectively:

> **Goal – Protect Water Resources.**
> Objectives:

- Prevent well pollution from road salt, septic tanks, and agricultural activity such as nitrates, pesticides, herbicides, etc.
- Protect ground water supplies
- Prevent non-point pollution to Scantic River
- Preserve wetlands
- Preserve floodplains
- Protect watershed areas
- Create and develop some greenbelt areas along Town waterways.

Table 5-7: Existing Drought Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Water Supply Protection District	Areas delineated as recharge areas for groundwater aquifers are protected by strict use regulations.	Groundwater recharge areas	Very effective for preventing groundwater contamination and for controlling stormwater runoff, promoting groundwater recharge.	Revise definitions for clarification – utilize state model from DEP.
Hampden Open Space and Recreation Plan	Makes recommendations for protecting Hampden's water quality and supply.	Entire town.	Somewhat effective for raising awareness about protecting water quality, supply, and conservation.	Implement plan goals.

Man-Made Hazards/Hazardous Materials

Hazardous materials are in existence throughout Town, and are constantly being moved on Hampden's roads and highways. However, there is no way to anticipate where and when a hazardous materials spill or explosion could take place. Therefore, it makes is somewhat difficult to determine mitigation strategies, but Hampden has some regulations currently in place to mitigate the impacts of a hazardous materials disaster.

Management Plans

Hazardous Materials Plans are separate documents within the complete CEM Plan, specific to each site.

Land Development Regulations

Hampden addresses hazardous materials management in the Zoning Bylaw regarding the Water Supply Protection District. The overlay district restricts the use, storage, or processing of hazardous materials within this overlay, unless by special permit. (See language in Flood section regarding Water Supply District.)

Table 5-8: Existing Man-Made Hazard/Hazardous Materials Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Water Supply Protection District	Areas delineated as recharge areas for groundwater aquifers are protected by strict use regulations.	Groundwater recharge areas.	Very effective for preventing groundwater contamination.	Revise for clarification – utilize state model from DEP.

6 – FUTURE MITIGATION STRATEGIES

Goal Statements and Action Items

As part of the natural hazards mitigation planning process that will be undertaken by the Hampden Natural Hazards Planning Committee, existing gaps in protection and possible deficiencies will be identified and discussed. The committee will then develop general Goal Statements and Action Items that, when implemented, will help to reduce risks and future damages from natural hazards. The Goal Statements, Action Items, town department(s) responsible for implementation, and the proposed timeframe for implementation for each category of natural hazard are described below.

Several of the Action Items have multiple benefits because, if implemented, these Action Items will mitigate or prevent damages from more than one type of natural hazards. For example, updating the Subdivision Regulations to require new utility lines be placed underground will prevent property damage and loss of service in the event of high winds (tornado or hurricane) or severe snow and ice storms.

General Mitigation Action Items

Goal Statement: To provide adequate shelter, water, food and basic first aid to displaced residents in the event of a natural disaster and to provide adequate notification and information regarding evacuation procedures, etc., to residents in the event of a natural disaster.

Action Item: Work to form Local Emergency Management Committee.
Responsible Department/Board: Emergency Management Director, Board of Selectmen
Proposed Completion Date*:* 2007

Action Item: Inventory supplies at existing shelters and develop a needs list and storage requirements. Establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplies in the event of a natural disaster.
Responsible Department/Board: Emergency Management Director, Local Emergency Management Committee (when formed)
Proposed Completion Date*:* 2008

Action Item: Examine current notification system including feasibility of new siren warning system, internet radio system, or Reverse 911.[14] Develop a preliminary project proposal and cost estimate.

[14] In essence, Reverse 911 is a Windows compatible software program, which uses GIS and database technology to create call lists of phone numbers within a specified geographical area and provide prerecorded messages to the residents at those numbers. Call lists can be created ahead of time or as emergency or other situations arise. The system is voluntary and it is a simple matter to remove those residents who do not wish to participate. Cost of the

Responsible Department/Board: Emergency Management Director, Board of Selectmen
Proposed Completion Date: 2009

Action Item: Collect, periodically update, and disseminate information on emergency information, what to include in a 'home survival kit,' how to prepare homes and other structures to withstand flooding and high winds, and the proper evacuation procedures to follow during a natural disaster.
Responsible Department/Board: Emergency Management Director
Proposed Completion Date: Ongoing

Action Item: Test effectiveness of existing generators at shelters.
Responsible Department/Board: Emergency Management Director, Board of Health
Proposed Completion Date: 2008

Flooding

Overall, the Town of Hampden's existing land use regulations regulate development, reduce or eliminate localized flooding events and control the quantity and quality of stormwater runoff. Long-range planning documents such as the town's Community Development Plan also address flood prevention and mitigation either directly or indirectly in the goals and objectives listed in these documents.

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to flooding.

Action Item: Replace top priorities on culvert replacement list to reduce flooding, pending availability of funding.
Responsible Department/Board: Highway Dept, Grants Committee
Proposed Completion Date: 2007

Action Item: Revise the Water Supply Protection District bylaw, utilizing the state model from DEP, with a focus on clarifying definitions. This will further help to protect groundwater supplies for drinking water and firefighting.
Responsible Department/Board: Planning Board, Board of Health, Fire Department
Proposed Completion Date: 2008

Action Item: Propose adoption of Stormwater Management Bylaw, pending availability of funding.
Responsible Department/Board: Planning Board - Stormwater Committee, Board of Selectmen

system varies depending on a number of factors. The Town of Green Tree, Pennsylvania was able to subsidize their purchase of a Reverse 911 system through a $10,000 Community Development Block Grant.

Proposed Completion Date: 2007

Action Item: Clarify requirements and responsibility of operation and maintenance of erosion control devices, retention/detention ponds, swales etc. in the Subdivision Regulations.
Responsible Department/Board*:* Board of Selectmen, Planning Board - Stormwater Committee, Building Inspector
Proposed Completion Date: 2008

Action Item: In regards to the Hampden Open Space and Recreation Plan, implement the goals and strategies, particularly those dealing with protection of floodplain, forests, and farmland.
Responsible Department/Board: Conservation Commission, Board of Selectmen, Open Space Committee, Planning Board
Proposed Completion Date: Ongoing

Action Item: Initiate process to become a part of FEMA's Community Rating System.
Responsible Department/Board: Board of Selectmen, Emergency Management Director
Proposed Completion Date: 2008

Action Item: Distribute information to citizens living in the floodplain about the NFIP.
Responsible Department/Board: Emergency Management Director, Building Inspector
Proposed Completion Date: 2008

Severe Snow Storms/Ice Storms

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to severe snow and ice storms.

Action Item: Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.
Responsible Department/Board: Planning Board, Town Consulting Engineer
Proposed Completion Date: Ongoing

Action Item: Purchase large snow-blower for severe drifting, pending availability of funding.
Responsible Department/Board: Emergency Management Director, Highway Dept, Board of Selectmen
Proposed Completion Date: 2009

Action Item: Increase enforcement of restrictions prohibiting residents from plowing snow into the road.
Responsible Department/Board: Board of Selectmen, Police Chief
Proposed Completion Date: 2008

Hurricanes/Severe Wind

The Action Items listed above, under flooding, address the flooding that can result from a hurricane.

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to high winds associated with hurricanes.

Action Item: Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.
Responsible Department/Board: Planning Board, Town Consulting Engineer
Proposed Completion Date: Ongoing

Tornadoes/Microbursts

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to high winds associated with tornadoes.

Action Item: Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.
Responsible Department/Board: Planning Board, Town Consulting Engineer
Proposed Completion Date: Ongoing

Wildfires/Brushfires

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to wildfires/brushfires.

Action Items: Revise Water Supply Protection District bylaw, utilizing the state model from DEP, with a focus on clarifying definitions. This will further help to protect groundwater supplies for drinking water and firefighting.

Responsible Department/Board: Planning Board, Board of Health, Fire Department
Proposed Completion Date: 2008

Action Items: Revise Subdivision Regulations regarding Rural Water Supply to make fire prevention water sources required.
Responsible Department/Board: Board of Selectmen, Planning Board, Fire Department
Proposed Completion Date: 2009

Action Items:–Increase education and enforcement of burn permits; including pre-season review of regulations in public outreach campaign and/or invoking penalties for offenders.
Responsible Department/Board: Board of Selectmen, Fire Department, Police Dept
Proposed Completion Date: 2009

Earthquakes

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to earthquakes.

Action Item: Determine whether critical facilities are earthquake resistant.
Responsible Department/Board: Building Inspector, Emergency Management Director
Proposed Completion Date: 2008

Dam Failure

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures.

Action Item: Incorporate dam safety into development review process.
Responsible Department/Board: Planning Board, Emergency Management Director
Proposed Completion Date: 2009

Action Item: Identify sources of funding for dam safety inspections.
Responsible Department/Board: Emergency Management Director
Proposed Completion Date: Ongoing

Drought

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures.

Action Items:–Revise Water Supply Protection District bylaw, utilizing the state model from DEP, with a focus on clarifying definitions. This will further help to protect groundwater supplies for drinking water and firefighting.
Responsible Department/Board*:* Planning Board, Board of Health, Fire Department
Proposed Completion Date: 2008

Action Item: In regards to the Hampden Open Space and Recreation Plan, implement the goals and strategies, particularly those dealing with protection of waterbodies.
Responsible Department/Board: Conservation Commission, Board of Selectmen, Open Space Committee, Planning Board
Proposed Completion Date: Ongoing

Action Item: Create Water Conservation Guidelines to educate, Town residents, pending the availability of funding.
Responsible Department/Board: Conservation Commission, Board of Selectmen
Proposed Completion Date: 2010

Hazardous Materials

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures.

Action Items:–Revise Water Supply Protection District bylaw, utilizing the state model from DEP, with a focus on clarifying definitions. This will further help to protect groundwater supplies for drinking water and firefighting.
Responsible Department/Board*:* Planning Board, Board of Health, Fire Department

Proposed Completion Date: 2008

Prioritized Implementation Schedule

Summary of Critical Evaluation

The Hampden Hazard Mitigation Planning Committee reviewed each of the actions identified above, as well as existing mitigation strategies using the following factors to prioritize mitigation projects. This list of factors is derived from FEMA's STAPLE+E criteria.

- Ability to reduce loss of life
- Ability to reduce disaster damage
- Social acceptability
- Ability to complete or be combined w/other actions
- Technical feasibility / potential success
- Impact on the environment
- Administrative workability
- Ability to meet regulations
- Political acceptability
- Ability to save or protect historic structures
- Legal implementation
- Ability to meet other community objectives
- Economic impact
- The duration of its implementation period
- Environmental compatibility

Project Prioritization

The Hampden Hazard Mitigation Planning Committee created the following prioritized schedule for implementation of prioritized items. The table lists items in order of priority.

Note: As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

PRIORITIZED IMPLEMENTATION SCHEDULE
(ACTION PLAN)

The Hampden Hazard Mitigation Planning Committee created the following prioritized schedule for implementation:

MITIGATION ACTION	RESPONSIBLE DEPARTMENT/BOARD	PROPOSED COMPLETION DATE	POTENTIAL FUNDING SOURCE(S)	ESTIMATED COST
Replace top priorities on culvert replacement list to reduce flooding, pending availability of funding.	Highway Dept, Grants Committee	2007	HMGP	$215,000
Propose adoption of Stormwater Management Bylaw, pending availability of funding.	Planning Board – Stormwater Committee, BOS	2007	Town Staff/Volunteers Local Technical Assistance Grant (PVPC)	$3,000
Work to form Local Emergency Management Committee (LEMC)	EMD, BOS	2007	Town Staff/Volunteer	N/A
Incorporate dam safety into development review process.	Planning Board, EMD	2009	Town Staff/Volunteers	N/A
Distribute information to citizens living in the floodplain about the NFIP.	EMD, Building Inspector	2008	Town Staff/Volunteers	N/A
Increase education and enforcement of burn permits, including preseason review of regulations in public outreach campaign and/or invoking penalties for offenders	Fire Dept, BOS, Police Dept	2009	Town Staff	N/A
Increase enforcement of restrictions prohibiting residents from plowing snow into the road	BOS, Police Dept	2008	Town Staff	N/A
Collect, update, disseminate emergency information to the public (‘home survival kit’; home preparation for natural disasters, evacuation procedures, etc.)	EMD, LEMC (when formed)	Ongoing	Town Staff/Volunteers	N/A
Examine current notification system including feasibility of new siren warning system, internet radio, or Reverse 911.	EMD, BOS	2009	Town Staff/Volunteers grants	TBD

Inventory supplies at shelters; coordinate with local vendors to supply shelters in case of natural disaster.	EMD, LEMC (when formed)	2008	Town Staff/Volunteers	N/A
Test effectiveness of generators at shelters	EMD, BOH	2008	Town Staff/Volunteers grants (for replacement)	N/A
Purchase large snow-blower for severe snow drifting.	EMD, Highway Dept, BOS	2008	Town Staff	TBD
Initiate process to become a part of FEMA's Community Rating System	BOS, EMD	2008	Town Staff	N/A
Determine whether critical facilities are earthquake resistant.	Building Inspector, EMD	2008	Town Staff	N/A
In regards to the Hampden Open Space and Recreation Plan, implement~~ing~~ the goals and strategies, particularly those dealing with protection of floodplain, forests, and farmland.	Con Com, BOS, Planning Board, Open Space Committee	Ongoing	Town Staff/Volunteers	N/A
Revise the Water Supply Protection District Bylaw, clarifying definitions.	Planning Board, BOH, Fire Department	2008	PVPC Local Technical Assistance	$2,500
Clarify requirements and responsibility of O&M for erosion control devices, detention/retention ponds, swales, etc. in the Subdivision Regulations	BOS, Planning Board, Stormwater Committee, Building Inspector	2008	Town Staff/Volunteers PVPC Local Technical Assistance	$2,500
Revise Subdivision Regulations regarding Rural Water Supply to make fire prevention water sources required.	BOS, Planning Board, Fire Dept	2009	Town Staff/ Volunteers	N/A
Incorporate dam safety into development review process.	Planning Board; EMD	2009	Town Staff/Volunteers	N/A
Create Water Conservation Guidelines.	Con Com, BOS	2010	Town Staff/Volunteers PVPC Local Technical Assistance	$2,500
Identify sources of funding for dam safety inspections.	EMD	Ongoing	Town Staff/Volunteers	N/A

Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.	Planning Board, Town Consulting Engineer	Ongoing	Town Staff/Volunteers	N/A

7 – PLAN ADOPTION & IMPLEMENTATION

Plan Adoption

Upon completion, copies of the Draft Local Hazards Mitigation Plan for the Town of Hampden were distributed to the town boards for their review and comment. A public meeting was held by the Hampden Board of Selectmen to present the draft copy of the Hampden Local Natural Hazards Mitigation Plan to town officials and residents and to request comments from this committee and the general public. The Natural Hazards Mitigation Plan was formally approved by the Board of Selectmen and forwarded to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their approval.

Plan Implementation

The implementation of the Hampden Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Hampden Board of Selectmen and approval by MEMA and FEMA. The Planning Board will be charged to integrate recommendations of the Local Natural Hazards Mitigation Plan into the Town's Master Plan and Open Space and Recreation Plan. Town departments and boards ~~will be~~ responsible for ensuring the development of policies, bylaw revisions, and programs as described in Sections 5 and 6 of this plan will be notified of their responsibilities immediately following approval. Hampden's newly formed Local Emergency Management Committee will oversee implementation of the plan.

Plan Monitoring and Evaluation

The Local Emergency Management Committee will meet on an annual basis in September of each of the following years: 2008, 2009, 2010, 2011, 2012, and as needed (*i.e.*, following a natural disaster) to monitor the progress of implementation and evaluate the success or failure of implemented recommendations. he public will be notified of these meetings in advance through a posting of the agenda in Town Hall. In addition, responsible parties identified for specific mitigation actions on the schedule below will be asked to submit their reports in advance of the meetings. The meetings of the committee will be organized and facilitated by the Emergency Management Director or the Hampden Board of Selectmen.

Meetings will entail the following actions:

- Review events of the year to discuss and evaluate major issues, effectiveness of current mitigation, and possible mitigation for future events.
- Review and evaluate progress toward implementation of the current mitigation plan based on reports from responsible parties.
- Amend current plan to improve mitigation practices.

Following these discussions, it is anticipated that the committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan. The committee will review and update the

Hampden Local Natural Hazards Mitigation Plan every five years. The first updated plan will be submitted to MEMA and FEMA in the fall of 2012.

REPORTING SCHEDULE FOR MITIGATION ACTION (BASED ON PRIORITIZED IMPLEMENTATION)

MITIGATION ACTION	RESPONSIBLE DEPARTMENT/BOARD	PROPOSED COMPLETION DATE	REPORTING DATE
Replace top priorities on culvert replacement list.	Highway Department, Grants Committee	2007	September 2008
Propose adoption of Stormwater Management Bylaw, pending availability of funding.	Planning Board, Stormwater Committee, BOS	2007	September 2008
Work to form Local Emergency Management Committee.	EMD, BOS	2007	September 2008
Identify sources of funding for dam safety inspections.	EMD	Ongoing	September 2008 September 2009 September 2010 September 2011 September 2012
Contract with utility companies to put underground new utility lines in general and existing utility lines in locations where repetitive outages occur.	Planning Board, Town Consulting Engineer	Ongoing	September 2008 September 2009 September 2010 September 2011 September 2012
Collect, update, disseminate emergency information to the public ('home survival kit'; home preparation for natural disasters, evacuation procedures, etc.)	EMD, LEMC (when formed)	Ongoing	September 2008 September 2009 September 2010 September 2011 September 2012
Implement goals and strategies in Open Space and Recreation Plan.	Conservation Commission, Planning Board, BOS, Open Space Committee	Ongoing	September 2008 September 2009 September 2010 September 2011 September 2012
Increase enforcement of restrictions prohibiting residents from plowing snow into the road.	BOS, Police Dept.	2008	September 2009
Distribute information to citizens living the floodplain about the NFIP.	EMD, Building Inspector	2008	September 2009
Inventory supplies at shelters; coordinate with local vendors to supply shelters in case of natural disaster.	EMD, LEMC (when formed)	2008	September 2009
Test effectiveness of generators at shelters	EMD, BOH	2008	September 2009
Purchase large snow blower for severe snow drifting	EMD, Highway Dept., BOS	2008	September 2009
Initiate process to become part of FEMA's Community Rating	BOS, EMD	2008	September 2009

System			
Determine whether critical facilities are earthquake resistant.	Building Inspector, EMD	2008	September 2009
Revise the Water Supply Protection District Bylaw, clarifying definitions.	Planning Board, BOH, Fire Dept.	2008	September 2009
Clarify requirements and responsibility of O&M for erosion control devices, detention/retention ponds, swales, etc.	BOS, Planning Board, Stormwater Committee, Building Inspector	2008	September 2009
Incorporate dam safety into development review process.	Planning Board, EMD	2009	September 2010
Increase education and enforcement of burn permits, including preseason review of regulations in public outreach campaign and/or invoking penalties for offenders.	Fire Dept., BOS, Police Dept.	2009	September 2010
Revise subdivision regulations regarding Rural Water Supply to make fire prevention water sources required.	BOS, Planning Board, Fire Dept.	2009	September 2010
Examine current notification system including feasibility of new siren warning system, internet radio, or Reverse 911.	EMD, BOS	2009	September 2010
Create Water Conservation Guidelines	Conservation Commission, BOS	2010	September 2011

CERTIFICATE OF ADOPTION

TOWN OF HAMPDEN, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE HAMPDEN

HAZARD MITIGATION PLAN

WHEREAS, the Town of Hampden established a Committee to prepare the Hampden Hazard Mitigation plan; and

WHEREAS, several public planning meetings were held between January and May 2007 regarding the development and review of the Hampden Hazard Mitigation Plan; and

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

WHEREAS, a duly-noticed public hearing was held by the Hampden Board of Selectmen on June 16, 2008 to formally approve and adopt the Hampden Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Hampden Board of Selectmen adopts the Hampden Hazard Mitigation Plan.

ADOPTED AND SIGNED this June 16th, 2008.

Duane Mosier, Chair
Hampden Board of Selectmen

John D. Flynn
Hampden Board of Selectmen

Richard Green
Hampden Board of Selectmen

ATTEST

APPENDICES

Appendix A – Technical Resources

1) Agencies

Massachusetts Emergency Management Agency (MEMA)……....508/820-2000
Hazard Mitigation Section 617/626-1356
Federal Emergency Management Agency (FEMA) 617/223-4175
MA Regional Planning Commissions:
Berkshire Regional Planning Commission (BRPC)……....413/442-1521
Cape Cod Commission (CCC)……....508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC)…… 508/693-3453
Franklin Regional Council of Governments (FRCOG)……...413/774-3167
Martha's Vineyard Commission (MVC)……..…508/693-3453
Merrimack Valley Planning Commission (MVPC)……..…...978/374-0519
Metropolitan Area Planning Council (MAPC)……...617/451-2770
Montachusett Regional Planning Commission (MRPC)……978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC)……508/228-7236
Northern Middlesex Council of Governments (NMCOG)……978/454-8021
Old Colony Planning Council (OCPC)……...508/583-1833
Pioneer Valley Planning Commission (PVPC)……...413/781-6045
Southeastern Regional Planning and Economic Development District (SRPEDD)……...508/823-1803
MA Board of Building Regulations & Standards (BBRS)……617/227-1754
MA Coastal Zone Management (CZM)……..617/626-1200
DCR Water Supply Protection……617/626-1379
DCR Waterways……617/626-1371
DCR Office of Dam Safety……...508/792-7716
DFW Riverways……617/626-1540
MA Dept. of Housing & Community Development……..617/573-1100
Woods Hole Oceanographic Institute……508/457-2180
UMass-Amherst Cooperative Extension……...413/545-4800
National Fire Protection Association (NFPA)……....617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX – an association of private companies & industries involved in disaster recovery planning)……781/485-0279
MA Board of Library Commissioners……....617/725-1860
MA Highway Dept, District 2……..413/582-0599
MA Division of Marine Fisheries……617/626-1520
MA Division of Capital & Asset Management (DCAM)……617/727-4050
University of Massachusetts/Amherst……....413/545-0111
Natural Resources Conservation Services (NRCS)……....413/253-4350
MA Historical Commission……....617/727-8470
U.S. Army Corps of Engineers……....978/318-8502
Northeast States Emergency Consortium, Inc. (NESEC).....781/224-9876
National Oceanic and Atmospheric Administration: National Weather Service; Tauton, MA…...508/824-5116
US Department of the Interior: US Fish and Wildlife Service 413/253-8200
US Geological Survey 508/490-5000

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) .....Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....Massachusetts Emergency Management Agency
Community Development Block Grant (CDBG)…….....DHCD, also refer to RPC
Dam Safety Program.....MA Division of Conservation and Recreation

Disaster Preparedness Improvement Grant (DPIG) .....Massachusetts Emergency Management Agency
Emergency Generators Program by NESEC[‡] ....Massachusetts Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....…USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP) .....Massachusetts Emergency Management Agency
Flood Plain Management Services (FPMS).....…..US Army Corps of Engineers
Mitigation Assistance Planning (MAP)..... Massachusetts Emergency Management Agency
Mutual Aid for Public Works.....Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) [†] .....Massachusetts Emergency Management Agency
Power of Prevention Grant by NESEC[‡].....Massachusetts Emergency Management Agency
Roadway Repair & Maintenance Program(s).....Massachusetts Highway Department
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
Shoreline Protection Program……..MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....MA Department of Environmental Protection
Wetlands Programs .....…MA Department of Environmental Protection

[‡]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 NESEC 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. MEMA 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/ha zards/	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/dis aster/	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/g eog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.html	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
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.html	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 – Documentation of the Planning Process

Incorporation of existing plans and other information

Existing plans, studies, reports and technical information were reviewed and incorporated throughout the planning process. This included significant information from the following key documents:

- *Hampden Comprehensive Emergency Management Plan* (particularly the Critical Infrastructure Section) – the Critical Infrastructure section was used to identify those infrastructure components in Hampden that have been identified as crucial to the function of the Town; also, this resource was used to identify special needs populations as well as potential emergency shortcomings.

- *Hampden Open Space and Recreation Plan* – this Plan was used to identify the natural context within which mitigation planning would take place. This proved useful insofar as it identified water bodies, rivers, streams, infrastructure components (i.e. water and sewer, or the lack thereof), as well as population trends. This was incorporated to ensure that the Town's mitigation efforts would be sensitive to the surrounding environment. During the OSRP update, Hampden can use the work of the PDM Plan to incorporate identified hazard areas into open space and recreation planning. This could either take the form of acquiring parcels of land that are currently un-developed, but situated within an identified hazard area, as permanent open space, thereby minimizing the likelihood that critical infrastructure components will be constructed in an area prone to damage from natural hazards.

- *Hampden Community Development Plan*—this Plan was used to identify any action items that might prove successful, based on previous planning efforts.

- *Hampden Zoning Bylaw/Ordinance* - The Town's Zoning Bylaw was used to gather and identify those actions that the Town is already taking that are reducing the potential impacts of a natural hazard (i.e. floodplain regulations) to avoid duplicating existing successful efforts.

- *Draft State of Massachussetts' Multi-Hazard Mitigation Plan* - This plan was used to ensure that the Town's Hazard Mitigation Plan is consistent with the State's Plan.

- *Hampden Highway DepartmentWinter Storm Review* – Snowfall information collected over the past 20 years by Dana Pixley of the Hampden Highway Department.

Hampden Hazard Mitigation Planning Committee

Meeting #1

AGENDA

February 13, 2007
10:00 a.m.
Hampden Town Offices

1) Identify Hazards (past and potential) on Base Map

- What are the hazards?
- What is at risk from those hazards?

2) Develop Base Map with Critical Facilities

- Identify Critical Facilities on Base Map. The following list contains items that should be clearly identified on the map, as they apply to your community:

- Emergency Operations Center
- Emergency Fuel Facilities
- Town/City Hall
- Police Station
- Fire Station
- Public Works Garages
- Water Treatment Facilities
- Sewage Treatment Plants
- Water Tower/Supply Pumps
- Power Plants
- Electrical Power Substations
- Schools
- Major Highways and Roadways
- Bridges
- Dams
- Nursing Homes
- Elderly Housing
- Day-Care Facilities
- Correctional Facilities
- Other Congregate Care Facilities
- Shelters
- Special Needs Populations
- Hazardous Materials Facilities
- Access Roads to Critical Facilities
- Evacuation Routes
- Unique or Historic Resources
- Commercial Economic Impact Areas
- Socio-Economic Impact Areas
- Areas with Second Language Needs
- Hospitals

3) Question and Answer Period

4) Set Goals and Date for Next Meeting

Hampden Hazard Mitigation Planning Committee
Meeting #2

AGENDA

February 27, 2007
1:00 p.m.
Hampden Town Offices

1) Review Identification of Hazards

- Past and Potential Hazards
- Critical Facilities Affected by Hazards (table)
  Is this information correct?

2) Analyze Development Trends

- Looking at Community Change
- Map out Development Patterns

3) Vulnerability Assessment

- Property in Floodplain
- Impacts of Hazards

4) Review the PDM Plan

- Is the information correct?
- What is missing?

5) Question and Answer Period

6) Set Goals for and Schedule Next Meeting

Hampden Hazard Mitigation Planning Committee
Meeting #3

AGENDA
March 21, 2007
10:00 a.m.
Hampden Town Offices

1) Identify What's in Place and What's Missing
- Review of Draft Existing Protection Measures
- Identify Gaps in Current Protection

2) Review Draft Goal Statements

3) Brainstorm Mitigation Actions
- What actions can be taken?
- Evaluating Action Feasibility

4) Question and Answer Period

5) Set Goals for and Schedule Next Meeting

Hampden Hazard Mitigation Planning Committee
Meeting #4

AGENDA

April 5. 2007
10:00 a.m.
Hampden Town Offices

1) Prioritize List of Mitigation Actions in Order of Importance

- Fill out the Evaluation Chart for each action.

2) Establish a Minimum Acceptable Level for Actions

3) Prioritize Final List of Actions

- Select actions which best suit Hampden's needs.
- Include actions that can be implemented quickly.

4) Develop Strategy to Implement Selected Prioritized Actions

- Who will be responsible for implementing each prioritized action?
- When will these actions be implemented?
- How will the Town fund the projects?

5) Question and Answer Period

Hampden Hazard Mitigation Planning Committee
Meeting #5

AGENDA

April 25. 2007
10:00 a.m.
Hampden Town Offices

1) **Develop Process for Adoption and Monitoring of the Plan**

2) **Discuss Next Steps for the Hampden's Natural Hazard Mitigation Plan including FEMA Review and Adoption by the Board of Selectmen**

3) **Review and Revise as Necessary Final Draft of the Hampden Natural Hazard Mitigation Plan**

Hampden Hazard Mitigation Planning Committee

c/o Pioneer Valley Planning Commission, 26 Central Street West Springfield, MA 01089

MEETING NOTICE

Date: Tuesday, October 23, 2007

Time: 9 a.m.

Place: Selectmen's Office, Hampden Town Hall

Agenda

1. Welcome

2. Review of FEMA comments on draft disaster mitigation plan

3. Identify how to address deficiencies and assign tasks (working with memorandum sent from PVPC on 10-4-07)

4. Next meeting

Town Clerk: Please post this notice per Massachusetts General Laws, Chapter 29, Section 23, A-C.

Hampden Hazard Mitigation Planning Committee

c/o Pioneer Valley Planning Commission, 26 Central Street West Springfield, MA 01089

MEETING NOTICE

Date: Tuesday, November 13, 2007

Time: 1 p.m.

Place: Selectmen's Office, Hampden Town Hall

Agenda

1. Welcome

2. Continue reviewing FEMA comments on draft disaster mitigation plan

3. Continue identifying how to address deficiencies and assign tasks (working with memorandum sent from PVPC on 10-10-07)

4. Schedule next meeting

Town Clerk: Please post this notice per Massachusetts General Laws, Chapter 29, Section 23, A-C.

Hampden, PVPC planning for emergencies

Committee mapping trouble spots in town

By Douglas Farmer
Staff Writer

HAMPDEN – Should a major natural event like a flood, hurricane, fire or drought hit the town of Hampden it is important to identify areas that are vulnerable such as properties in the floodplain, narrow roads and wells prone to failure said Kristin Heery, an environmental planner with the Pioneer Valley Planning Commission (PVPC). And she has been working with a local committee to coordinate plans of various town departments and catalog resources available to respond to an emergency both within the town and without.

The PVPC has been developing such hazard mitigation plans with towns throughout the area, backed financially by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA), and Heery herself is also working with the communities of Ludlow and Southwick. Hampden's volunteer committee has included Selectman John D. Flynn, planning board clerk Kathy Foster, Hampden Highway Superintendent Dana Pixley and town resident Melissa Lail-Trecker.

Heery said the meetings so far have revolved around mapping trouble spots in town along with facilities like the town offices, police and fire departments, water supply areas, culverts, schools and vulnerable populations like at Mary Lyon Rehabilitation and Nursing Center. Within the text of the document – now exceeding 100 pages – procedures in place for town personnel and equipment like sanders and fire trucks and local zoning regulations are incorporated into a comprehensive plan that may include suggested prioritization of funding for future action to prevent a disaster from spreading.

Fortunate Timing

MEMA will review the hazard mitigation plan (due in May) and then the Hampden Board of Selectmen will vote on whether or not to accept it as policy. And Heery said the timing of the work has been fortunate, as Pixley had recent applied for $125,000 in funding through a FEMA grant program to replace an undersized box culvert under Main Street near Hampden Hardware – an area where the pipe has deteriorated and flooding has occurred periodically.

"My understanding is that we have a real shot at getting the funding, but we need to have this mitigation plan in place for the application to move forward," said Pixley. "A replacement culvert would be increased in diameter and so would reduce potential flooding in the future. Overall, at these meetings I've been providing a lot of information about problem areas in town, but it's probably good to have a refresher of mapping them."

Foster pointed out that since the flooding of October 2005, it has become apparent that the town needs to devise a way to inform people of potential emergencies, and improved communication with the community is a piece of the plan they are devising.

Heery agreed. "Although it had initially been PVPC's objective to produce one big regional plan, we decided that we will have smaller local plans, all with the same format," she said. "It's been helpful for me because I've been able to talk to fire chiefs, department of public works directors and others who know their town and what its needs are."

And Lail-Trecker said hazard mitigation planning has been an interesting and eye-opening process for her to go through.

"Hampden doesn't have a lot of resources, so it's good to know what we should do as far as education and infrastructure improvements go," she said. "My husband and I used to live in New Orleans and a friend of ours set up a hospital at Louisiana State University after Hurricane Katrina, which was one of the few things that seemed to go right. So we do need to know how to respond to a regional disaster here before it happens."

Reporter Douglas Farmer can be reached at dfarmer@turley.com.

Mailing cookies...

TIMES photo submitted

Hampden Girl Scouts are shipping Girl Scout Cookies out to service members Kevin Gobeille and Michael Nye. Soon to go will be more cookies sent to troops stationed at Westover Air Reserve Base and Major Jim Lynch who has been stationed at an Iraqi hospital. (Front from left to right) Miranda Polhemus, Stephanie Chapin, Adriana Isham, Amanda Lynch and Haley Isham. (Back row) Lauren Chapin and Amber from the Hampden Post Office.

The Republican.

'Predisaster plans' readied for grants

Sunday, September 23, 2007

By NANCY H. GONTER
ngonter@repub.com

It's the public's turn to weigh in on plans prepared by local communities to keep the damage from natural disasters to a minimum.

Sixteen "predisaster mitigation plans," developed by the Pioneer Valley Planning Commission working with local officials from each community, are part of an effort to secure grant money from the Massachusetts Emergency Management Agency, said Catherine M. Miller, principal planner with the commission.

"This comes from an effort by the Federal Emergency Management Agency that while we are aware you can't prevent natural disasters from happening, you can prevent the long term consequences," Miller said.

Comments may be made by calling Andrew Smith at the Commission at (413) 781-6045 or by e-mailing him at asmith@pvpc.org by Nov. 30.

The plans were developed with a state grant of $224,962 which was supplemented by local communities for total cost of just under $300,000, she said.

Each plan looks at the risks communities may face from natural disasters such as flooding, tornadoes, drought and earthquakes, and what can be done to prevent damage to property and loss of life. They also prioritize projects for funding for mitigation efforts, Miller said.

An example of a mitigation project is Greenfield's purchase of the Wedgewood Gardens mobile home park which was badly flooded by the Green River in 2005 and had previously been flooded, although that was not part of this program, Miller said.

The commission is working with 32 communities in this area and a second round of 16 more communities will soon be started. They are Amherst, Belchertown, Brimfield, Chicopee, Cummington, Goshen, Granby, Huntington, Palmer, Southampton, Springfield, Westfield, West Springfield, Westhampton, Williamsburg and Worthington.

After that, a plan for the entire region will be prepared, Miller said.

Northampton Deputy Fire Chief Dana Cheverette, a member of the local committee that worked with the commission on the city's plan, said going through the process of preparing the plan was helpful.

"You identify the flood plans and you identify the area where you need to put your resources. In 1988 when the Oxbow area flooded, a lot of people got isolated. Now we know where the people could get isolated," Cheverette said.

Appendix C – List of Acronyms

FEMA	Federal Emergency Management Agency
MEMA	Massachusetts Emergency Management Agency
PVPC	Pioneer Valley Planning Commission
EPA	Environmental Protection Agency
DEP	Massachusetts' Department of Environmental Protection
NWS	National Weather Service
HMGP	Hazard Mitigation Grant Program
FMA	Flood Mitigation Assistance Program
SFHA	Special Flood Hazard Area
CIS	Community Information System
DCR	Massachusetts Department of Conservation and Recreation
FERC	Federal Energy Regulatory Commission
TRI	Toxics Release Inventory
FIRM	Flood Insurance Rate Map
NFIP	National Flood Insurance Program
CRS	Community Rating System
BOS	Board of Selectmen
BOH	Board of Health
LEPC	Local Emergency Planning Committee
EMD	Emergency Management Director
Con Com	Conservation Commission
EOC	Emergency Operations Center
CEM Plan	Comprehensive Emergency Management Plan
WMECO	Western Massachusetts Electric Company
HAZMAT	Hazardous Materials

Appendix D – Past & Potential Hazards/Critical Facilities Map