

The Town of Westhampton

# Local Natural Hazards Mitigation Plan

Adopted by the Westhampton Board of Selectmen on \_\_\_\_\_

**Prepared by:**  
The Westhampton Natural Hazards Mitigation Planning Committee

and

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# 1: INTRODUCTION

## Hazard Mitigation

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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 Westhampton 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 hazard mitigation plan before a disaster occurs can save the community money and 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

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The natural hazard mitigation planning process for the Town of Westhampton included the following tasks:

- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure 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.
- Identifying deficiencies in the current strategies and establishing goals for updating, revising or adopting new strategies.
- Adopting and implementing the final Local Natural Hazards Mitigation Plan.

The key product of this process is the development of an Action Plan with a Prioritized Implementation Schedule.

## **Public Committee Meetings**

Tuesday, March 11, 2008, 7:00 pm at Westhampton Town Hall: Informational and organizational meeting; identified past natural hazard occurrences, location and damage assessments; reviewed draft critical facilities map.

Tuesday, April 8, 2008, 7:00 pm at Westhampton Town Hall: Identified critical facilities and evacuation routes; analyze development trends; complete Table 3.1 Hazard Profile and Risk Index Worksheet; review vulnerability and assessment methodology and potential loss estimates; identify goals and objectives for hazard mitigation; identify mitigation strategies for natural hazards; prioritize mitigation strategies; schedule public comment period.

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

On June 30, 2008 the Pioneer Valley Planning Commission sent a press release (see Appendices) to all area media outlets to inform the public that a draft of Westhampton's Hazard Mitigation Plan was available for a 30-day public comment period. The plan could be found on PVPC's website and hard copies were available at PVPC's office and Westhampton Town Hall. Residents businesses and other concerned parties of Westhampton and adjacent communities were encouraged to comment on the plan. Citizens from adjacent communities were also encouraged to comment on Westhampton's plan and on the plans of four other communities (Cummington, Palmer, Westfield and Southampton) that were also posted for that same period.

## **Public Meetings with the Board of Selectmen**

November 2005: The Board of Selectmen agreed to begin the process of developing a Local Hazard Mitigation Plan. Meeting held at Westhampton Town Offices.

\_\_\_\_\_ 2009: The Board of Selectmen adopted the Local Natural Hazard Mitigation Plan. Meeting held at Westhampton Town Offices.

## 2: LOCAL PROFILE

### Community Setting

Westhampton is a small, rural town in Hampshire County in Western Massachusetts. It is located 20 miles northwest of Springfield and about 100 miles west of Boston. Westhampton is bordered by Chesterfield and Williamsburg to the north, Huntington to the west, Southampton to the south, and Easthampton and Northampton to the east.

Established in 1778 as a farming community, Westhampton is characterized by rolling hills and a country atmosphere. There are several dairy farms which continue to operate full-time. Maple sugar houses can be seen throughout the town, and many residents engage in maple sugaring in the winter. In addition to farming, wood products and lumber are still important industries. A very small percentage of Westhampton's land area has been developed for commercial use, with only three stores in town. The center offers a picturesque setting with a library, town hall, church and the town common.

Westhampton's history is well-preserved. One of its most famous citizens was Revolutionary War patriot Ethan Allen; in addition, Reverend Enoch Hale, brother of Nathan Hale, was the first minister of the town. The Westhampton Blacksmith Shop Museum houses a vast collection of memorabilia donated by residents and continues to preserve the history of the town. Since the Prohibition era, Westhampton has been a "dry" town, the only such town in Hampshire County.

Westhampton maintains a quiet, rural character highlighted by a forested landscape and historic villages. Despite the waning influence of agriculture on the landscape, Westhampton remains largely undeveloped and fundamentally rural in nature. Dense forests, several rivers, and abundant farmland and open fields highlight the landscape in town. The overall quality of life and rural character make Westhampton a desirable place to live, and the Town has seen steady growth in recent years.

### Infrastructure

Westhampton's geographical features have shaped the town's historical development patterns. The chain of hills that ring the western section of town—Dry Hill, Spruce Hill, Cub Hill, Fisher Hill, Red Oak Hill—have channeled development into the lowlands of the eastern side of town. These slowly-sloping bottom lands contain the prime agricultural soils and wide open pastureland that have made Westhampton a rural, agricultural community for centuries. The location of agricultural soils, flat land and the availability of groundwater sources in the eastern section of town made this the first, and most densely, settled part of town. Recently, those interested in moving to Westhampton for its scenic qualities have been drawn to the town's gentle hills.

#### *Roads and Highways*

The major artery running through town is Route 66, which connects Westhampton with Northampton to the east and with Huntington to the west, where Route 66 connects with Route 112, which runs north-to-south and links up with Route 20 on its southern terminus and runs north to the Vermont border. Westhampton residents can travel east along Route 66 through Northampton to Interstate 91, which travels north-to-south and provides access to all of western New England.

### ***Water and Sewer***

Westhampton decommissioned its municipal water supply service in 1990. All residents are on private well water. All parts of the town are served by private septic systems.

### ***Schools***

The Hampshire Regional High School, which serves the towns of Westhampton, Williamsburg, Southampton, Chesterfield and Goshen, is located in the center of Westhampton. The town also has one elementary school, Westhampton Elementary.

## **Natural Resources**

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Westhampton most significant natural resource is the large blocks of un-fragmented forest and open land, coupled with several pristine water bodies. In addition to providing habitat and clean air and water, the rural, undeveloped nature of the town contributes to its appeal for tourism and recreation.

### ***Water Resources***

Westhampton is a water-rich town with several brooks, large bodies of surface water and the headwaters of the Manhan River.

While many streams in Westhampton flow intermittently during high water periods, there are several perennial streams: the Manhan River, Turkey Brook, Lyman Brook, Sodom Brook, Rice Brook, Breakneck Brook and Branch Shop Brook. Both branches of the Manhan River originate in Westhampton. The east branch of the Manhan River can be traced back to the intersection of Northwest Road and Kings Highway; and the West Branch begins south of Route 66 and flows into the White Reservoir and then on to Easthampton through Southampton.

### ***Forests and Fields***

Westhampton is almost entirely covered by forest, which provides an abundance of timber, opportunities for recreation, wildlife habitat, the benefits of climate moderation, and the protection of water quality. The forest and intermixed agricultural land also provide a visually pleasant landscape for residents and visitors too. The town's forests are mainly closed-canopied and middle-aged, having a great diversity of species, but no diversity of horizontal or vertical structural. Interestingly, the town is 85% forested, and many of these lands have some form of permanent protection.

Large blocks of contiguous forestland such as those in Westhampton are important resources for several reasons. First they represent an area with a low degree of fragmentation. Wildlife species that require a certain amount of deep forest cover

separate from people's daily activities tend to migrate out of fragmenting landscapes. New frontage lots and subdivisions can often result in a widening of human activity, an increase in the populations of plants and animals that thrive alongside humans (i.e. raccoons and squirrels) and a reduction in the species that have larger home ranges and unique habitat needs. Large blocks of forest provide clean water, air, and healthy wildlife populations.

## **Development**

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Westhampton's growth was initiated first by farmers, and more recently, residential development. But the town's topography, soils, and physiography (lakes, rivers, wetlands and watershed areas) shape and constrain these land use patterns.

In addition to other factors, zoning and other land use regulations constitute Westhampton'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.

The Westhampton Zoning Bylaw establishes one base zone for the entire town: Agricultural-Residential District; and two overlay zones: Floodplain District and Water Supply Protection District.

Although appropriate zoning is all relevant to protecting the health and safety of the Town residents, Westhampton's two overlay districts are specifically relevant to natural hazard mitigation. These are outlined here:

- Floodplain District - The floodplain overlay applies to those areas within the boundary of the one-hundred-year flood that are considered hazardous according to FEMA. This is also extended, where applicable, to lands within 100 feet of the riverbank. It limits some uses for preventing potential flood damage and/or minimizing erosion and sedimentation of the Westfield River.
- Water Supply Protection District - This purpose of this overlay district is to protect and preserve Westhampton's groundwater resources from potentially damaging pollution or environmental degradation by regulating certain uses within the district. The regulations state specific prohibited and restricted uses, regulates drainage, details site plan requirements and special permit procedures.

The Zoning Bylaw also establishes a Site Plan/Special Permit Approval procedure for specific uses and structures within Westhampton. This review allows the Special Permit Granting Authority the ability to review development to ensure that the basic safety

and welfare of the people of Westhampton are protected, and includes several specific evaluation criteria that are relevant to natural hazards.

### ***Current Development Trends***

Today, the vast majority of Westhampton's 27.4 square miles is undeveloped land, totaling close to 15,215 acres. Agricultural land is the second most prolific land use, at approximately 980 acres, followed closely by residential land at approximately 940 acres. Industrial land constitutes about 174 acres, but commercial land constitutes a relatively small 13 acres. There are 35 acres of outdoor recreational land in Town, and land characterized as urban open/public land constitutes another 57 acres.

Because of its terrain, the town has been able to maintain a quiet, country character. Most current development consists of single-family homes; the remainder of land in Westhampton is hilly and forested, with scattered open and agricultural fields. The town's population has nearly doubled in the last 30 years, growing about 1,458 residents. Today, the threat of development exists as single-family homes continue to replace agricultural fields and forested land.

Currently, the zoning laws are minimal and serve to space houses out along the roads but nevertheless lead to strip development. However, Westhampton does have some land use regulations to encourage development where most appropriate, and the necessity of private septic systems also acts as a constraint on development.

### ***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 5 residential structures located within the Special Flood Hazard Area (SFHA) in Westhampton as of August 2005, the most current records in the CIS for the Town of Westhampton.

## 3: HAZARD IDENTIFICATION & ANALYSIS

### Profiling the Natural Hazards

Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to identify and profile the natural hazards which are most likely to have an impact on Westhampton.

Each of these hazards was assessed by the Committee for location of occurrence, extent, previous occurrences, and probability of future events. (See Appendix C for sources, methodology.) This resulted in a ranking of hazard, by risk, see Table 3.1. More detailed descriptions of each of the points of analysis are included in the Identification and Vulnerability Assessment (below).

**Table 3.1: Hazard Profiling and Risk Index Worksheet**

Type of Hazard	Location	Extent	Previous Occurrences	Probability of Future Events	Hazard Risk Index Rating
Flooding (100-year)	Small	Minor	Yes	Moderate	Low
Flooding (localized)	Medium	Limited	Yes	Moderate	Medium
Severe Snow/Ice Storms	Large	Limited	Yes	High	Medium
Hurricanes/Severe Wind	Large	Limited	Yes	Moderate	Medium
Tornado/Microburst	Small	Limited	Yes	Moderate	Medium Low
Wildfire/Brushfire	Small	Minor	Yes	Moderate	Low
Earthquake	Large	Critical	No	Low	Low
Dam Failure	Small	Limited	Yes	Low	Low
Drought	Large	Minor	No	Low	Low
Man-Made Hazard: Hazardous Materials	Small	Minor	No	Low	Low

## **Natural Hazard Identification and Vulnerability Assessment**

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

### **Vulnerability Assessment Methodology**

In order to determine estimated losses due to natural hazards in Westhampton, each hazard area was analyzed with results shown below. The data below was calculated using FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses*, August 2001.

**Total value of all structures in Westhampton (2006): \$ 233,399,124**

**Median value of a home in Westhampton (2006): \$265,000**

**Average household size: 2.4 persons**

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 damage calculations are rough estimate and likely reflect worst-case scenarios. Computing more detailed damage assessment based on assessor's records is a labor-intensive task and beyond the scope of this project.

## **Flooding**

The average annual precipitation for Westhampton and surrounding areas in northwestern Massachusetts is 46 inches. There are three major types of storms that bring precipitation to Westhampton. 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. 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 levels in water bodies. Flood levels may then increase, causing damage to structures not normally in the flood path.

The Floodplain Map for the Town of Westhampton 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, also called the Special Flood Hazard Area under FEMA's Community Information System. Likewise, the 500-year flood has a 0.2 percent chance of occurring in any given year.

According to NFIP, the following areas have been designated as Special Flood Hazard Areas (SFHA) in Westhampton:

- Roberts Meadow Brook south of North Road and north of Montague Road;
- The intersection of the Manhan River and Northwest Road;
- The Manhan River beginning at the Intersection of Perry Hill and Kings Highway and running down to the Northampton City Boundary;
- The west branch of the Manhan River along the shores of the White Reservoir.

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. Westhampton has experienced many flooding events over the last decade. Generally, these small floods have had minor impacts, temporarily impacting roads and residents' yards. However, town-wide flooding in 2007 caused significant damage.

As described above, flooding can happen on a range of scales. For the purposes of this analysis, the hazard has been broken into two separate types – **Flooding (100-year)** and **Flooding (localized)**. Risk and vulnerability assessment for these separate types of flooding are analyzed below.

### **Flooding (100-year base flood): Medium Risk**

There are approximately 150 acres of land within the FEMA mapped 100-year floodplain and 34 acres of land within the 500-year floodplain within the Town of Westhampton. According to the Community Information System (CIS) of FEMA, there were 5 residential structures located within the Special Flood Hazard Area (SFHA), or 100-year floodplain, in Westhampton as of August 2005, the most current records in the CIS for the Town of Westhampton. Therefore, a vulnerability assessment for a 100-year flood equals approximately \$1.3 million of damage to residential structures, with approximately 12 people impacted.

Specific vulnerability assessments are unavailable for sites within the SFHA which have been susceptible to 100-year floods in the past because past flooding has not occurred in these areas with the exception of flooding on Northwest Road. However, there are no residential structures within the Northwest Road SFHA and, therefore, a vulnerability assessment was not relevant. At this time the Town of Westhampton has no repetitive loss properties as defined by FEMA's NFIP.

#### Northwest Road at beaver pond

This portion of Northwest Road is within the 100-year floodplain. The culvert carrying water out of the pond is undersized for large storms and clogs causing flooding onto the road. During the past 20-years, the road at this location has flooded less than a dozen times. During the heavy rains in April of 2007, the flooding undermined the road and caused a large sink hole just as a tractor trailer was traveling by. Approximately 75' of the road needed to be rebuilt at a cost of \$3,000 in material and labor for the Town. In addition, there are approximately 2 residential structures in this area that could be affected by a flood incident. With 100% damage to 100% of the structures, the

estimated cost of repairing or replacing would be \$530,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

### **Flooding (localized) – Medium Risk**

In addition to the floodplains mapped by FEMA for the 100-year and 500-year flood, Westhampton often experiences minor flooding at isolated locations due to drainage problems, or problem culverts.

There are a total of 4 problem culverts or other localized flooding areas are all over Town, and have been mapped on the Past and Potential Hazards/Critical Facilities Map (Appendix D). 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. During the April 2007 flooding, the town was reimbursed \$36,222.50 from FEMA for repair to work on the Northwest Road, Chesterfield Road, Laurel Hill Road and Tob Road.

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. Specific vulnerability assessments were estimated for sites which have been susceptible to localized flooding in the past, and are described below.

#### Chesterfield Road to the Chesterfield Town Line

For approximately ½ mile from the Chesterfield town line, the road collects water running off the mountain. During the April 2007 flood, the road was closed down to one lane due to extreme flooding. MassHighway Department brought in directional signs for traffic. One residential driveway was also washed out. The Town repaved the road and one driveway to mitigate the damage. The Highway Department has not maintained exact cost estimates for repairs for this specific event. In addition, there are approximately 2 residential structures in this area that could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be \$530,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

#### Laurel Hill Road

A 36" culvert on Laurel Hill Road clogs during large storm events, causing flooding onto this dirt road. During the April 2007 floods, the road washed out requiring the Town to rebuild the road. The Highway Department has not maintained exact cost estimates for repairs for this specific event. In addition, there are approximately 2 residential structures in this area that could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be \$530,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

### Kings Highway

During the April 2007 floods, runoff from the hillside on Reservoir Road caused severe erosion of Kings Highway. There is an approximate 100' grade change between the elevation of the Manhan River and Kings Highway in this location. Runoff from the mountain crossed the road in its rush to the Manhan. Both the extreme volume and velocity of the runoff eroded the bank and undercut the road. This road provides access to approximately 15 houses, none of which incurred any damages directly. The Town recently initiated a contract for permanent repair of the bank and realignment of the road in the amount of \$32,400.

### Tob Road

This unpaved road suffered washout during the April 2007 floods. Runoff from the adjacent hillside over flowed the roadside ditches severely damaging the road. No residential structures were affected.

## **Severe Snow/Ice Storm – High Risk**

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 also 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.

Westhampton's recent history has not recorded any loss of life due to the extreme winter weather, but there are usually several incidents of property damage or personal injury each winter. In addition, during heavy snow years, accumulations can reach several feet deep. Westhampton's rugged topography creates some steep grades, sometimes making plowing difficult and causing snow and ice hazards. Many of the farms and open meadows and fields throughout town cause snow drifts.

Severe winter weather occurs regionally and therefore would impact the entire town, although several specific locations are more susceptible to damage. These problem areas have been identified and assessed for vulnerability.

Snow drifts in the travel lane are most notable at the following locations:

- South Road north of intersection with Route 66
- 185 Main Road (Route 66) at open fields on corner
- North Road at intersection with Montague Road

### **Hurricanes/Severe Wind – Medium-Low Risk**

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. Severe wind can also occur in the absence of a hurricane, especially impacting mountain tops. Global warming will increase the threat of hurricanes and severe wind as oceans and the atmosphere warms. Climate change research indicates that storms like hurricanes will become more intense and more frequent in the future.

In Massachusetts, sixteen hurricanes have had landfall since 1851, two of which impacted Western Massachusetts. These include Hurricane Carol in 1954 and Hurricane Gloria in 1985. Hurricanes are usually ranked category 1-5, using the Saffir-Simpson Scale, with category 5 hurricanes being the most severe. Both Hurricane Carol and Gloria were category 1-2 storms, meaning winds ranged from 74-110 mph with the potential for some roofing or window damage to buildings, damage to unanchored mobile homes, trees, or poor construction, and/or some minor flooding.

Westhampton'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. During hurricanes or severe wind events, the Town has experienced small blocks of downed timber and uprooting of trees onto structures.

- Estimated wind damage: 5% of the structures with 10% damage, \$1,166,996;
- Estimated flood damage: 10% of the structures with 20% damage, \$4,667,982;
- Vulnerability assessment for a hurricane event (both wind and flood damages): \$5,834,978;
- Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

### **Tornadoes/Microbursts – Low Risk**

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. Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester, including towns in Hampshire 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. Microbursts and tornadoes are expected to become more frequent and more violent as the earth's atmosphere warms, due to predictions of climate change from global warming.

There are no documented incidences of tornados or microbursts occurring in Westhampton. However, two severe wind events have occurred in the past thirty years based on the recollection of the project advisory committee. In the mid-1980s, it is believed that a tornado touched down at about the Chesterfield town line causing a lot of tree and property damage along East Street. In the early summer in the mid-1990s, a sever wind came through out of the northwest and traveling to the southeast. The event caused the largest widespread power outage in recent history. The town landfill was reopened to allow people to dispose of rotten food. Damage estimates for both events were not available.

In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath east of Westhampton, known as "tornado alley." Thirteen incidents of tornado activity (all F2<sup>1</sup> or less) occurred in Hampshire County between 1959 and 2005.

Because tornadoes and microbursts rarely occur in this part of the country, assessing damages is difficult. Furthermore, buildings have not been built to Zone 2, Design Wind Speed Codes. The entire Town of Westhampton is vulnerable.

- Tornadoes/microburst hazard estimates 20% damage to 10% of structures in Town;
- Vulnerability assessment estimates in damages; \$4,667,982
- Estimated cost does not include building contents, land values or damages to utilities.

## **Wildfires/Brushfire – Low Risk**

According to FEMA, there are three different classes of wildland fires: surface fires, ground fires and crown fires. 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

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<sup>1</sup> F2 refers to the commonly used Fujita Tornado Damage Scale which ranks tornados F0-F5 depending on estimated wind speeds and damages, with F5 the most severe.

under windy conditions. While wildfires or brushfires have not been a significant problem in Westhampton, 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.

Hampshire County has approximately 252,000 acres of forested land, which accounts for 72% of total land area. Forest fires are therefore a potentially significant issue. In Westhampton, approximately 85% of the town's total land area is in forest, or about 14,937 acres, and is therefore at risk of fire. Burn permits are issued by the Fire Department over the phone on Saturdays and Sundays. Residents call in the morning, and depending on weather conditions, the Fire Department will issue a verbal permit.

The Westhampton Fire Department reports that in the past 14 years, there have only been small brushfires covering less than a few acres at the most. All of the fires were permitted burns that got out of control.

However, moderate risk exists for potential wildfire incidents, especially near some of the town's forested, agricultural, and recreational lands. Forested and agricultural areas with high fuel content have more potential to burn. In addition, it is often very difficult to access some of the locations to extinguish the brushfire.

## **Earthquakes – Low Risk**

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. 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. Earthquakes can occur suddenly, without warning, at any time of the year. New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.

**Table 3.2: New England Earthquakes (1924-2002)<sup>2</sup>**  
**magnitude 4.2 or higher**

<b>Location</b>	<b>Date</b>	<b>Magnitude</b>
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

**Table 3.3: New England States Record of Earthquakes<sup>2</sup>**

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 Earthquakes in New England (1568-1989)		1,239

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.

- Because many of the buildings were built before 1975, there is potential for serious damage in Westhampton;
- Structures are mostly wood frame construction, so loss estimates predict 20% of town assessed value, not including Costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures;
- Vulnerability assessment estimates approximately \$46,679,825.

## Dam Failure – Low Risk

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. 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. Most earthen dam failures occur when floodwaters above overtop and erode the material components of the dam.

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.

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

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 DCR sources, as well as local knowledge, there are currently six (6) dams<sup>3</sup> in Westhampton. The follow table identifies the dams within the town as well as whether they are classified as low, significant, or high hazard.

<b>Table 3.4: Dams in Westhampton</b>				
<b>Dam</b>	<b>Owner</b>	<b>Year Built</b>	<b>Purpose</b>	<b>Hazard Risk</b>
Pine Island Lake Dam	Pine Island Lake Association	1910	Recreation	High
Pine Island Lake Dike	Pine Island Lake Association	1920	Recreation	Significant
Lyman Pond Dam	David and Richard Lyman	unknown	unknown	Low

The Lyman Pond Dam failed during the flood of 1955 taking out the bridge on Route 66. Since then the bridge has been rebuilt twice, once in 1955 and again in 1989 (or the early 1990s). Also based on the recollection of the project advisory committee, flood waters in the 1955 flood also overtopped the Pine Island Lake Dam. Downstream damage was minimal. Work was performed on this dam in the mid-1990s.

A delineated inundation zone is not available for the three dams and therefore a vulnerability assessment is not available.

### **Drought – Low Risk**

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.

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.

In Massachusetts, six major droughts have occurred statewide since 1930. 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.

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. Even so, there have been several years of drought-like conditions in Western Massachusetts: 1940-1952, 1980-1983, and 1995-2001. Furthermore, 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. Additionally, even minor droughts will increase the risk of wildfire, especially in areas of high recreational use.

Westhampton has had limited experience with severe drought conditions. The town has not experienced a threat to the private wells, and doesn't anticipate any severe water shortages throughout town.

## **Man-Made Hazards – Hazardous Materials – Low Risk**

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.

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. According to TRI, there are no industries currently releasing hazardous materials within Westhampton's town limits. Hathaway Construction is the only Tier II Hazardous Materials storage facilities in Westhampton. MSDS sheets are kept on file at the Fire and Police Departments.

Even so, 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.

Westhampton 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 Route 66 is a concern. Small areas of hazardous materials storage increase the potential for future incidents.

## 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**

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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 Westhampton has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Westhampton'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 Westhampton.
- 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 critical facilities and evacuation routes potentially affected by hazard areas are identified in Table 4-1, following this list. The Past and Potential Hazards/Critical Facilities Map (Appendix D) identifies these facilities.

### **Category 1 – Emergency Response Services**

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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: Westhampton Fire Department, 48 Stage Road

Secondary: Westhampton Elementary School, 37 Kings Highway

- 2) Fire Station  
Westhampton Fire Department, 48 Stage Road
- 3) Police Station  
Westhampton Police Department, 48 Stage Road
- 4) Highway Department  
Westhampton Highway Department, 58 Hathaway Road
- 5) Water  
Westhampton Elementary School, 37 Kings Highway  
Hampshire Regional High School, 19 Stage Road
- 6) Emergency Fuel Stations  
Public Safety Complex, 48 Stage Road
- 7) Emergency Electrical Power Facility  
See below.  
Public Safety Complex, 48 Stage Road
- 8) Emergency Shelters \*Shelters also have generators  
\*Westhampton Elementary School, 37 Kings Highway  
\*Hampshire Regional High School, 19 Stage Road  
Westhampton Congregational Church, 1 Tob Road
- 9) Transfer Station  
Westhampton Transfer Station, 52 Hathaway Road
- 10) Helicopter Landing Sites  
Hampshire Regional High School parking lot, 19 Stage Road  
Westhampton Elementary School, 37 Kings Highway
- 11) Communications  
Route 66 – 2 cell towers  
Southampton Road – 1 cell tower
- 12) Primary Evacuation Routes  
Route 66  
Chesterfield Road  
Northwest Road  
Southampton Road  
Loudville Road
- 13) Bridges/Culverts Located on Evacuation Routes  
Route 66 – two Sodom Brook crossings; 1 Manhan River crossing  
Chesterfield Road – 2 Roberts Meadow Brook crossings  
Northwest Road – 2 Manhan River crossings; Roberts Meadow Brook  
Southampton Road – 1 Sodom Brook crossing

Loudville Road – 1 culvert to unnamed brook

## **Category 2 – Non Emergency Response Facilities**

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

1) Problem Culverts/Drainage Systems

Chesterfield Road near Roberts Meadow Brook  
Laurel Hill Road at Lyman Brook  
Kings Highway at Manhan River  
Tob Road near small tributary to Manahan River  
Northwest Road at Manhan River

2) Water Supply

None

3) Pumping Stations

Hampshire Regional High School – 100,000 gallon tank with diesel pump; 2 wells

4) Electricity

Loudville Road  
Route 66  
South Road

## **Category 3 – Facilities/Populations to Protect**

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

1) Special Needs Population

Senior Housing, 13 Main Street

2) Elderly Housing/Assisted Living

See above.

3) Public Buildings/Areas

See above.

4) Schools

Westhampton Elementary School, 37 Kings Highway  
Hampshire Regional High School, 19 Stage Road

5) Churches

Westhampton Congregational Church, 1 Tob Road

- 6) Historic Buildings/Sites  
Cemetery Road
- 7) Apartment Complexes  
None
- 8) Employment Centers  
None
- 9) Other Special Institutions  
Windy Acres Campground, 139 South Road

## **Category 4 – Potential Resources**

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Contains facilities that provide potential resources for services or supplies.

- 1) Food/Water  
Outlook Farm, 136 Main Street
- 2) Hospitals/Medical Supplies  
Easthampton Fire Department, 32 Pryson Avenue (Ambulatory Care)  
Southampton Fire Department American Medical Response (Ambulatory Care)  
Northampton Fire Department, Carlon Drive
- 3) Gas  
Public Safety Complex
- 4) Building Materials Suppliers  
Fluery Lumber, Easthampton
- 5) Heavy & Small Equipment Suppliers  
None
- 6) Gravel Pits  
Chesterfield Road  
North Road  
South Road  
Reservoir Road
- 7) Transportation  
Florence Taxi Service, 21 North Maple Street, Northampton  
Lecrenski Brothers (Buses), 169 College Highway, Southampton  
Liebenow's (Buses), Route 9, Cummington  
Strong Corporation (Buses), 40 O'Neil Street, Easthampton

**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)	Northwest Road	None	Northwest Road
Flooding (localized)	Chesterfield Road	None	Chesterfield Road
	Laurel Hill Road	None	None
	Kings Highway	None	Kings Highway
	Tob Road	None	None
	South Road	Electrical Distribution	None
Severe Snow/Ice Storm	185 Main Road	None	Route 66 (Main Road)
	North Road	None	None
	Town-wide	None	None
Wildfire/Brushfire	Town-wide	None	None
Earthquake	Town-wide	None	None
Dam Failure	Lyman Pond Dam/Pine Island Lake Dam	Tier II Facility at Hathaway Construction	Route 66 (Main Road)
Drought	Town-wide	None	None
Hazardous Materials	Perry Hill Road and North Road	None	None

(Past & Potential Hazards/Critical Facilities Map Located In Appendix D)

## 5: MITIGATION STRATEGIES

One of the steps of this Natural Hazard Mitigation Plan is to evaluate all of the town's existing policies and practices related to natural hazards and identify potential gaps in protection. Once these gaps in protection are identified, future mitigation strategies can be crafted and recommended. This is done by evaluating existing and future measures in comparison to the Town's goal statement for natural hazard mitigation.

### Goal Statement

To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to natural disasters. 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.

For the extent of this analysis, the Committee reviewed the following Town documents:

- Zoning By-Law
- Subdivision Rules and Regulations
- CEM Plan
- Other relevant By-Laws as identified (Fire Department Burn Permit Procedures, Building Code, etc.)

This section of the plan serves to identify current mitigation strategies and recommend future mitigation strategies. This is done both generally, and by hazard type.

### General Mitigation Measures

Several of the recommended mitigation measures have multiple benefits because, if implemented, they will mitigate or prevent damages from more than one type of natural hazard. These do not fall under one hazard type, but could be put into place for facilitation of better natural hazard protection generally.

Some of these general hazard-related strategies and measures do not fall specifically under the category of "mitigation," but are instead tools for preparedness. The Hazard Mitigation Planning Committee recognizes that these are also important recommendations for the Town, and has included them here:

#### What's the CEM Plan?

An important existing general preparedness and response tool is Westhampton's Comprehensive Emergency Management Plan (CEM Plan). Although the CEM Plan is focused on the procedural response to an emergency, it organizes information, includes supply and information inventories, and outlines detailed steps for increasing

- Form Local Emergency Planning Committee.
- Establish system to 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.
- 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.

## Flooding

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The key factors in flooding are the water capacity of water bodies and waterways, the regulation of waterways by flood control structures, and the preservation of flood storage areas and wetlands. As more land is developed, more flood storage is demanded of the town's water bodies and waterways.

### *Current Mitigation Measures*

The Town currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the Town's zoning by-law, subdivision regulations, as well as a proposed stormwater management by-law. Relevant goals are included in the adopted Open Space and Recreation Plan. Infrastructure like dams and culverts are in place to manage the flow of water. These current mitigation strategies are outlined in the following table.

Table 5-1: Existing Flood Hazard Mitigation Measures

Existing Strategy		Description	Effectiveness	Potential Changes
Flood Control Structures		Three dams.	Somewhat effective.	Ensure dam owners realize their responsibility to inspect the dams.
Culvert Replacement and Drainage Improvements		Kings Highway – realign road for better drainage	Very effective for managing flood control needs.	Seek funding from HMGP for top-priority projects.
Zoning By-Law	Floodplain District	Overlay district to protect areas delineated as part of the 100-year floodplain by regulating uses and special permit requirements.	Very effective for preventing incompatible development within the flood prone areas.	
	Water Supply Protection District	District to protect groundwater resources by regulating certain uses, drainage, and other requirements within	Very effective for preventing groundwater contamination and managing infiltration.	Revise Haz-Mat definitions for clarification – utilize state model from DEP.

		recharge area of aquifer.		
	Earth Removal	Operations over 100 yd <sup>3</sup> are regulated, including setbacks and erosion control measures.	Effective for preventing sedimentation and erosion.	
	Special Permit/Site Plan Approval	With just one base zone in town, many uses require special permit approval, which includes regulations for drainage, groundwater, etc.	Somewhat effective for preventing incompatible development.	Create more performance-based evaluations, environmental standards.
Subdivision Regulations	Definitive Plan	Must include proposed drainage.	Somewhat effective.	Include regulations that stormwater BMPs must be used where applicable.
		BOH must review the land to determine suitability, especially for drainage.	Effective.	
	Design Standards	Protection of Natural Features – encouraged to consider significant features in site layout.	Somewhat effective.	Restrict altering natural features rather than just encourage protection.
		Floodplain District – properties within the floodplain have additional safety requirements	Low effectiveness.	Restrict development in floodplain.
	National Flood Insurance Program Participation	As of 2006, there were 3 homeowners with flood insurance policies.	Somewhat effective, provided that the town remains enrolled in the National Flood Insurance Program.	The town should evaluate whether to become a part of FEMA's Community Rating System.

### ***Future Mitigation Measures***

Several potential changes to the Town's current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Ensure dam owners realize their responsibility to inspect the dams regularly.
- Replace culverts / improve drainage systems:
  - Northwest Road
  - Tob Road
  - Chesterfield Road
  - Laurel Hill Road

- Revise the Water Supply Protection District, utilizing the state model from DEP, with a focus on clarifying definitions.
- Create more performance-based evaluations and environmental regulations for special permit requirements.
- Include regulations that stormwater BMPs must be used where applicable.
- Restrict altering natural features rather than just encourage protection.
- Restrict development in floodplain.
- Evaluate whether to become a part of FEMA's Community Rating System.
- Educate citizens living in the floodplain about the NFIP.
- Develop Beaver Management Strategy.

### **What is the NFIP's Community Rating System?**

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), 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.

## **Severe Snow/Ice Storm**

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Winter storms can be especially challenging for emergency management personnel. 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. Even though the storm has usually been forecast, there is no certain way for predicting its length, size or severity. Therefore, mitigation strategies must focus on preparedness prior to a severe snow/ice storm.

### ***Current Mitigation Measures***

The Town's current mitigation tools and strategies focus on preparedness, with many regulations and standards established based on safety during storm events. These current mitigation strategies are outlined in the following table.

Note: 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 snow/ice storms.

**Table 5-2: Existing Severe Snow/Ice Storm Hazard Mitigation Measures**

Existing Strategy		Description	Effectiveness	Potential Changes
Subdivision Regulations	Design Standards	Street grade regulations (maximum 6% for primary streets, 12% for secondary streets )	Effective.	None
	Required Improvements	Utilities must be placed underground at time of construction	Effective for preventing power loss.	None
State Building Code		The Town of Westhampton has adopted the Massachusetts State Building Code.	Effective.	None
Backup Electric Power		Shelters have backup power, three mobile generators	Very effective in case of power loss.	None
Tree Management		List of dangerous trees created annually for WMECO.	Very effective, preventative collaboration.	None

### ***Future Mitigation Measures***

Several potential changes to the Town's current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Draft bylaw to deal with wireless communication facilities.
- Increase enforcement of restrictions prohibiting residents from plowing snow into the road.
- Participate in the creation of a Regional Debris Management Plan.
- Install generate at Highway Department

#### **What is a Regional Debris Management Plan?**

Natural disasters can precipitate a variety of debris, including trees, construction and demolition materials and personal property. After a natural disaster, potential threats to the health, safety and welfare of impacted citizens can be minimized through the implementation of a debris management plan. Such a plan can be critical to recovery efforts after a disaster, including facilitating the receipt of FEMA funds for debris clearance, removal and disposal.

## Hurricanes/Severe Wind

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Of all the natural disasters that could potentially impact Westhampton, 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). Even with significant warning, hurricanes can do significant damage – both due to flooding and severe wind.

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.

The high winds that oftentimes accompany hurricanes can also damage buildings and infrastructure. But regulations can be put into place to help minimize the extent of wind damages.

The Town's current mitigation strategies to deal with severe wind are equally applicable to wind events such as tornadoes and microbursts. Therefore, the analysis of severe wind strategies is coupled with this hazard.

## Tornadoes/Microbursts

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The location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes or microbursts comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail. 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. In addition, current land development regulations can also help prevent wind damages.

The following table outlines the Town's existing mitigation strategies that help prevent wind damages, whether from hurricanes, tornadoes, microbursts, or any other event.

**Table 5-3: Existing Severe Wind Hazard Mitigation Measures  
(Including Hurricane, Tornado, Microburst Hazards)**

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Mobile Homes	Mobile homes/trailers are permitted with some additional regulations; can be used as temporary residence without regulations	Not effective for preventing damage to susceptible structures	None

Subdiv Regs	Design Standards	Utilities must be placed underground	Effective for preventing power loss.	None
State Building Code	The Town has adopted the MA State Building Code.	Effective.	None	
Tree Management	List of dangerous trees created annually for WMECO.	Very effective, preventative collaboration.	None	

### ***Future Mitigation Measures***

Several potential changes to the Town's current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Draft bylaw to deal with wireless communication facilities.
- Participate in the creation of a Regional Debris Management Plan.

## **Wildfire/Brushfire**

Although somewhat common, the vast majority of brushfires in Westhampton are small and quickly contained. However, as with any illegal fire or brushfire, there is always the risk that a small brushfire could grow into a larger, more dangerous wildfire, especially if conditions are right. Therefore, it is important to take steps to prevent wildfires and brushfires from turning into natural disasters.

### ***Current Mitigation Measures***

The following table identifies what the Town is currently doing to manage brushfires and makes some suggested potential changes and recommendations for decreasing the Town's likelihood of being heavily impacted by a wildfire or brushfire.

Table 5-4: Existing Wildfire/Brushfire Hazard Mitigation Measures				
Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-Law	Principal Use Regulations	Fire Chief must inspect all construction plans.	Effective	None
	Special Use Regulations	Campground must be inspected for fire access prior to special permit approval.	Effective.	None
	Special Permit/Site Plan Approval	Copies of site plan must be approved by Fire Department.	Effective.	None
Burn Permits	Residents must obtain burn permits, and personnel provide information on safe burn practices	Somewhat effective.	Consider increasing enforcement of burning regulations, perhaps invoke penalties for	

			offenders.
Public Education/ Outreach	The Fire Department has an ongoing educational program in the schools and mailer to all residents	Effective.	None

### ***Future Mitigation Measures***

Several potential changes to the Town's current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Increase education and enforcement of burn permits; including pre-season review of regulations in public outreach campaign and/or invoking penalties for offenders.

## **Earthquake**

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.

### ***Current Mitigation Measures***

The Town's most relevant existing mitigation measures are described in the following table.

**Table 5-5: Existing Earthquake Hazard Mitigation Measures**

Existing Strategy	Description	Effectiveness	Potential Changes
State Building Code	The Town of Westhampton has adopted the State Building Code.	Effective for new buildings only.	Evaluate older structures categorized as critical facilities to determine if they are earthquake resistant.
Debris Management Plan	A debris management plan could be developed.	Effective.	Consider participation in the creation of a Regional Debris Management Plan.

### ***Future Mitigation Measures***

Potential changes to the Town's current strategies have been identified in the above table, and these are compiled below:

- Evaluate critical facilities to determine if they are earthquake resistant.
- Participate in the creation of a Regional Debris Management Plan.

## **Dam Failure**

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Dam failure is a highly infrequent occurrence, but a severe incident could prove catastrophic. In addition, dam failure most often coincides with flooding, so its impacts can be multiplied, as the additional water has no where to flow.

### ***Current Mitigation Measures***

The only mitigation measures currently in place are the state regulations governing the construction, inspection, and maintenance of dams. This is managed through the Office of Dam Safety at the Department of Conservation and Recreation.

**Table 5-6: Existing Dam Failure Hazard Mitigation Measures**

Existing Strategy	Description	Effectiveness	Potential Changes
New Dam Construction Permits	State law requires a permit for the construction of any dam.	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).	Low. The responsibility for this is now on dam owners, who may not have sufficient funding to comply.	Identify sources of funding for dam safety inspections. Incorporate dam safety into development review process.

### ***Future Mitigation Measures***

Recent changes in legislation have shifted some of the responsibility of dam safety onto dam owners. The Town recognizes the need to adjust to this change. Several potential changes to the Town's current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Identify sources of funding for dam safety inspections.

## Drought

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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.

### ***Current Mitigation Measures***

Westhampton 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.

**Table 5-7: Existing Drought Hazard Mitigation Measures**

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Water Supply Protection District	District to protect groundwater resources by regulating certain uses, drainage, and other requirements within recharge area of aquifer.	Very effective for preventing groundwater contamination and increasing infiltration.	None
	Earth Removal	Operations over 100 yd <sup>3</sup> are regulated, including setbacks and erosion control measures.	Effective for preventing sedimentation and erosion.	None
Subdivision Regulations	Definitive Plan	Proposed storm drainage, sewer, water supply, and major site features (including natural features) must be included.	Effective for ensuring adequate water supply and preventing drainage problems.	None
		BOH must assess the suitability of the land, especially regarding septic.	Effective for protecting groundwater quality.	None

### ***Future Mitigation Measures***

Potential changes to the Town's current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Revise Water Supply Protection District to clarify definitions for hazardous materials/wastes – utilize the state model from DEP.
- Create Water Conservation Guidelines, as education to Town residents.

## Hazardous Materials

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Hazardous materials are in existence throughout Town, and are constantly being moved on Westhampton'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 Westhampton has some regulations currently in place to mitigate the impacts of a hazardous materials disaster.

**Table 5-8: Existing Hazardous Materials Hazard Mitigation Measures**

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Hazardous Waste District	This district currently does not exist, but if a hazardous waste site looked to locate in town, the land would need to be re-zoned to this district.	Somewhat effective, no regulations for district.	None
	Water Supply Protection District	No hazardous materials permitted within areas delineated as recharge areas for groundwater aquifers.	Very effective for preventing groundwater contamination.	Update definitions to be consistent with State definitions.

### ***Future Mitigation Measures***

Potential changes to the Town's current strategies have been identified in the above table, and these are compiled below:

- Revise Water Supply Protection District to clarify definitions for hazardous materials/wastes - utilize the state model from DEP.

# 6: PRIORITIZED IMPLEMENTATION SCHEDULE

## Summary of Critical Evaluation

The Westhampton Hazard Mitigation Planning Committee reviewed each of the recommendation future mitigation measures identified, and used the following factors to prioritize mitigation projects:

- 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 Westhampton 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.*

**Table 6.1: Prioritized Implementation Schedule – Action Plan**

Priority	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Funding Source/Estimated Cost	Incorporation into Existing Plans
1	Replace culverts / improve drainage systems: Northwest Road Tob Road Chesterfield Road Laurel Hill Road	Highway Department	2013	Town Funds Hazard Mitigation Grant	No
2	Install generator at Highway Department	Highway Department Board of Selectmen	2010	Town Funds	No
3	Ensure dam owners realize their responsibility to inspect the dams regularly.	Highway Department Board of Selectmen	2009	Town Funds	No
4	Restrict development in floodplain.	Planning Board	2013	Town Funds	No
5	Evaluate whether to become a part of FEMA's Community Rating System.	Board of Selectmen	2010	Town Funds	No
6	Educate citizens living in the floodplain about the NFIP	Board of Selectmen	2009	Town Funds	No
7	Develop Beaver Management Strategy.	Conservation Commission Highway Department	2011	Town Funds	No
8	Create more performance-based evaluations and environmental regulations for special permit requirements.	Planning Board	2011	Town Funds	No
9	Form Local Emergency Planning Committee.	Board of Selectmen Police and Fire Departments	2009	Town Funds	No

10	Revise the Water Supply Protection District, utilizing the state model from DEP, with a focus on clarifying definitions.	Planning Board Water Department	2010	Town Funds	No
11	Include regulations that stormwater BMPs must be used where applicable.	Planning Board	2010	Town Funds	No
12	Increase enforcement of restrictions prohibiting residents from plowing snow into the road.	Highway Department Police Department	2009	Town Funds	No
13	Draft bylaw to deal with wireless communication facilities.	Planning Board Building Inspector	2011	Town Funds	No
14	Participate in the creation of a Regional Debris Management Plan.	Board of Selectmen Police and Fire Department	2009	Town Funds	No
15	Establish system to 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.	Board of Selectmen Police and Fire Departments	2009	Town Funds	No
16	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.	Board of Selectmen Police and Fire Departments	2009	Town Funds	No

17	Revise Water Supply Protection District to clarify definitions for hazardous materials/wastes – utilize the state model from DEP.	Highway Department Planning Board	2009	Town Funds	No
18	Create Water Conservation Guidelines, as education to Town residents.	Highway Department Planning Board	2009	Town Funds	No
19	Identify sources of funding for dam safety inspections.	Highway Department Board of Selectmen Police and Fire Departments	2011	Unknown	No
20	Increase education and enforcement of burn permits; including pre-season review of regulations in public outreach campaign and/or invoking penalties for offenders.	Fire Department	2009	Town Funds	No

## **7: PLAN ADOPTION & IMPLEMENTATION**

### **Plan Adoption**

Upon completion, copies of the Draft Local Hazards Mitigation Plan for the Town of Westhampton were distributed to the town boards for their review and comment. A public meeting was held by the Westhampton Board of Selectmen to present the draft copy of the Westhampton 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 Westhampton Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Westhampton Board of Selectmen and approval by MEMA and FEMA. Those town departments and boards 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 and will integrate their hazard mitigation responsibilities into their annual work plans as appropriate. Westhampton's Board of Selectmen will oversee the implementation of the plan.

### **Plan Monitoring and Evaluation**

The measure of success of the Westhampton Local Natural Hazards Mitigation Plan will be the number of identified mitigation strategies implemented. In order for the town to become more disaster resilient and better equipped to respond to natural disasters, there must be a coordinated effort between elected officials, appointed bodies, town employees, regional and state agencies involved in disaster mitigation, and the general public.

The Westhampton Natural Hazards Planning Committee will meet on an annual basis or as needed (i.e., following a natural disaster) to monitor the progress of implementation, evaluate the success or failure of implemented recommendations, and brainstorm for strategies to remove obstacles to implementation. 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. At a minimum, the committee will review and update the plan every five years, beginning in the winter of 2013. The meetings of the committee will be organized and facilitated by the Emergency Management Director or the Westhampton Board of Selectmen.

The approved Westhampton Hazard Mitigation plan will be available for public review at the Town Hall and the public library, as well as available on the PVPC website for ongoing public review and comment.



CERTIFICATE OF ADOPTION  
TOWN OF WESTHAMPTON, MASSACHUSETTS  
BOARD OF SELECTMEN  
A RESOLUTION ADOPTING THE WESTHAMPTON  
NATURAL HAZARD MITIGATION PLAN

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

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

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

WHEREAS, a duly-noticed public hearing was held by the Westhampton Board of Selectmen on \_\_\_\_\_, 2007 to formally approve and adopt the Westhampton Hazard Mitigation Plan.

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

ADOPTED AND SIGNED this \_\_\_\_\_, 2008.

Charles Norris, Chair  
Westhampton Board of Selectmen

Westhampton Board of Selectmen

ATTEST

Westhampton Board of Selectmen

# 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) .....
Flood Plain Management Services (FPMS).....	Massachusetts Emergency Management Agency 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) Internet Resources

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	<a href="http://www.colorado.edu/litbase/hazards/">http://www.colorado.edu/litbase/hazards/</a>	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	<a href="http://wxp.eas.psu.edu/hurricane">http://wxp.eas.psu.edu/hurricane</a>	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	<a href="http://nemaweb.org">http://nemaweb.org</a>	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	<a href="http://www.gsfc.nasa.gov/nード/disaster/">http://www.gsfc.nasa.gov/nード/disaster/</a>	Searchable database of sites that encompass a wide

		range of natural disasters.
NASA Natural Disaster Reference Database	<a href="http://ltpwww.gsfc.nasa.gov/ndrd/main/html">http://ltpwww.gsfc.nasa.gov/ndrd/main/html</a>	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	<a href="http://www.statelocal.gov/">http://www.statelocal.gov/</a>	General information through the federal-state partnership.
National Weather Service	<a href="http://nws.noaa.gov/">http://nws.noaa.gov/</a>	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	<a href="http://h20.usgs.gov/public/realtime.html">http://h20.usgs.gov/public/realtime.html</a>	Provisional hydrological data
Dartmouth Flood Observatory	<a href="http://www.dartmouth.edu/artsci/geog/floods/">http://www.dartmouth.edu/artsci/geog/floods/</a>	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	<a href="http://www.fema.gov/fema/csb.html">http://www.fema.gov/fema/csb.html</a>	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	<a href="http://www.met.fsu.edu/explores/tropical.html">http://www.met.fsu.edu/explores/tropical.html</a>	Tracking and NWS warnings for Atlantic Hurricanes and other links
The Tornado Project Online	<a href="http://www.tornadoproject.com/">http://www.tornadoproject.com/</a>	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	<a href="http://www.nssl.uoknor.edu/">http://www.nssl.uoknor.edu/</a>	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	<a href="http://www.iiaa.iix.com/ndcmap.html">http://www.iiaa.iix.com/ndcmap.html</a>	A multi-disaster risk map.
Earth Satellite Corporation	<a href="http://www.earthsat.com/">http://www.earthsat.com/</a>	Flood risk maps searchable by state.
USDA Forest Service Web	<a href="http://www.fs.fed.us/land">http://www.fs.fed.us/land</a>	Information on forest fires and land management.

## **Appendix B – List of Acronyms**

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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 C – Natural Hazard Profiling Methodology<sup>4</sup>**

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In order to adeptly profile each of the hazards, 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, Probability of Future Occurrence, 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 as Table 3.1.

### ***Location of Occurrence***

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

<b>Table C.1: Location of Occurrence, Percentage of Town Impacted of Given Natural Hazard</b>	
<b>Location of Occurrence</b>	<b>Percentage of Town Impacted</b>
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

### ***Extent of Impacts***

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

<b>Table C.2: Extent of Impacts, Magnitude of Multiple Impacts of Given Natural Hazard</b>	
<b>Extent of Impacts</b>	<b>Magnitude of Multiple Impacts</b>
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.

### ***Previous Occurrences***

Whether or not previous hazard events had occurred is also included, with detailed descriptions of specific previous occurrences within the hazard identification and vulnerability assessments, if necessary.

### ***Probability of Future Occurrence***

The likelihood of a future event for each natural hazard was classified according to the following scale:

**Table C.3: Frequency of Occurrence and Annual Probability of Given Natural Hazard**

Frequency of Occurrence	Probability of Future Event
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

### ***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

## **Appendix D – Past & Potential Hazards/Critical Facilities Map**

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See Attached

## Appendix E – Documentation of the Planning Process

**Westhampton Hazard Mitigation Planning Committee  
Meeting #1**

**Tuesday, March 11, 2008  
Westhampton Fire Department**

**AGENDA**

- 1) Introduction and Purpose of Committee**
- 2) What is Hazard Mitigation Planning?**
- 3) Organize Hazard Mitigation Team**
- 4) Identify Critical Facilities** (to be shown on Base map)
  - 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:

<ul style="list-style-type: none"><li>- Emergency Operations Center- Nursing Homes</li><li>- Emergency Fuel Facilities</li><li>- Town/City Hall</li><li>- Police Station</li><li>- Fire Station</li><li>Facilities</li><li>- Public Works Garages</li><li>- Water Treatment Facilities</li><li>- Sewage Treatment Plants</li><li>- Water Tower/Supply Pumps</li><li>Facilities</li><li>- Power Plants</li><li>- Electrical Power Substations</li><li>- Schools</li><li>- Major Highways and Roadways</li><li>- Bridges</li><li>- Dams</li></ul>	<ul style="list-style-type: none"><li>- Elderly Housing</li><li>- Day-Care Facilities</li><li>- Correctional Facilities</li><li>- Other Congregate Care</li><li>- Shelters</li><li>- Special Needs Populations</li><li>- Hazardous Materials Facilities</li><li>- Access Roads to Critical</li><li>- Evacuation Routes</li><li>- Unique or Historic Resources</li><li>- Commercial Economic Impact Areas</li><li>- Socio-Economic Impact Areas</li><li>- Areas with Second Language Needs</li><li>- Hospitals</li></ul>
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- 5) Hazards Analysis Methodology**
  - Identify Past Hazard Occurrences, Location and Damage Assessments
  - Hazard Identification and Analysis Worksheet
- 6) Information needed for PDM Plan**
  - Review list of questions
- 7) Schedule and Agenda for Next Meetings**

**Westhampton Hazard Mitigation Planning Committee  
Meeting #2**

**Tuesday, April 8, 2008  
Westhampton Town Hall**

**AGENDA**

1. Identify residential structures at risk from potential flooding
2. Hazard Profile and Risk Index Sheet (Table 3.1)
3. Review Critical Facilities
4. Review Critical Facilities and Evacuation Routes Potentially Affected By Hazard Areas (Table 4.1)
5. Goals and Objectives for Hazard Mitigation
6. Identify Mitigation Strategies for Natural Hazards
7. Prioritize Mitigation Strategies

## PRESS RELEASE

CONTACT: Catherine Miller, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE  
June 30, 2008

### **Pre-Disaster Mitigation Plans Public Comment Period**

The Pioneer Valley Planning Commission, in conjunction with local Hazard Mitigation Planning Committees, has produced drafts of Pre-disaster Mitigation Plans for the communities of Cummington, Palmer, Southampton, Westfield and Westhampton. Residents, business owners and other concerned parties of the named municipalities as well as of adjacent communities are encouraged to comment on each and all of the plans. The plans are currently able to be viewed on the Pioneer Valley Planning Commission website (under Projects and Plans) and the websites of the municipalities, where possible. Paper copies of the plans may be obtained at the Pioneer Valley Planning Commission offices at 26 Central Street, West Springfield or at the individual City/Town Halls. The plans will be available for the next 30 days.

Over the upcoming months pre-disaster mitigation plans will be developed for Amherst, Belchertown, Brimfield, Chicopee, Goshen, Granby, Huntington, Springfield, West Springfield, Williamsburg, and Worthington and will also be available for public comment as they are developed.

This planning effort is being undertaken to help communities assess the risks they face from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

In 2006-2007, PVPC facilitated development of plans for 16 communities in Hampshire and Hampden counties. Following completion of this second round of 16 hazard mitigation plans, PVPC will be developing a regional Hazard Mitigation plan. Communities with approved plans are eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency. For additional information, please contact Catherine Miller at (413) 781-6045 or [cmiller@pvpc.org](mailto:cmiller@pvpc.org).