THE CITY OF EASTHAMPTON

LOCAL NATURAL HAZARDS MITIGATION PLAN

September 2, 2008
Adopted by the Mayor of Easthampton on _____

Prepared by:
The Easthampton Natural Hazards Mitigation Planning Committee
and
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Kevin Croake, Fire Chief, Emergency Management Director
David Mottor, Deputy Fire Chief
Captain Donald Emerson, Police Department
Joseph Pipczynski, Department of Public Works
Dennis Lacourse, Board of Health
Stuart Beckley, City Planner

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TABLE OF CONTENTS

1 - INTRODUCTION

Hazard Mitigation

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

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

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

Planning Process

The natural hazard mitigation planning process for the City of Easthampton included the following tasks:

- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure (i.e., critical facilities, public buildings, roads, homes, businesses, etc.) at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations a community is currently implementing to protect against future disaster damages. Examples of such strategies include:

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

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

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

During the planning process, the City's Local Natural Hazard Planning Committee (see acknowledgement page for specific information), headed by Kevin Croake, Easthampton Fire Chief and Emergency Management Director, and staff of the Pioneer Valley Planning Commission (see acknowledgement page for specific information) identified Action Plan items and specific time frames. The actions were selected from a list of local strategies which were compiled by the regional LEPC during several brainstorming sessions (see Regional Natural Hazard Mitigation Plan Risk Assessment Matrix – Section 3: Risk Assessment) and others identified by the City during their review of existing programs, policies, and regulations. From this list, specific Action Items were prioritized by the City's Local Natural Hazards Planning Committee based on the following criteria:

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

For example, updating or adopting a local floodplain ordinance would be a relatively low cost action item, which could have a significant impact on mitigating hazards caused by flooding. If adopted by the City, this ordinance would discourage development in floodplain areas and prevent harm to people and damage to property. Another action item was to review and maintain shelters for victims of natural hazards within the City and to conduct outreach to residents so that they are aware of the availability of those shelters.

First, however, the City must identify what services are available at the different shelters (e.g. food preparation, potable water, back-up electrical power, heat, showers, etc.) and whether the location of different shelters will be impacted by different hazards (i.e. whether flooding will

make the shelter inaccessible to some residents). This action item, review and maintain shelters, also addressed a number of different natural hazards and would help ensure that suitable shelters are available for different types of natural hazards. The action items selected were all considered to have a low to moderate cost to implement. In some cases grant funding would be sought for implementation given the limited resources available in the City.

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

Public Committee Meetings

October 30, 2006, 9:00-10:00 a.m.: Public informational and organizational meeting, held at Easthampton Public Safety Complex.
December 12, 2006, 9:00-10:00 a.m.: Working committee meeting held at Easthampton Public Safety Complex
January 9, 2007, 9:00-10:00 a.m.: Working committee meeting held at Easthampton Public Safety Complex.
February 13, 2007, 9:00-10:00 a.m.: Working committee meeting held at Easthampton Public Safety Complex.
March 13, 2007, 9:00-10:00 a.m.: Working committee meeting held at Easthampton Public Safety Complex.
April 11, 2007 9:00-10:00 a.m.: Working committee meeting held at Easthampton Public Safety Complex.
November 16, 2007 9:30 a.m.-10:30a.m.: Working committee meeting held at Easthampton Public Safety Complex.

Copies of the meeting agendas can be found in Appendix B.

Public Meetings with the Board of Selectmen

The Mayor adopted the Local Hazard Mitigation Plan on _____. Hearing held at Easthampton Municipal Offices.

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.

Participation by Public & Entities in Surrounding Communities

In the initial stages of the planning process for this mitigation plan, the Pioneer Valley Planning Commission conducted a series of outreach efforts to make the public aware of the regional mitigation process. In October of 2005, the Planning Commission notified all Select Boards and Chief Elected Officials that their community could participate in the region's mitigation planning process. Again, on April 4, 2006, the Planning Commission mailed a notice of planning

activities to all Chief Elected Officials and Select Board in the Pioneer Valley. Both mailings explained the purpose of mitigation planning and invited communities to participate in either Round I or Round II of the region's mitigation planning process.

On September 13, 2007 the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform the general public that drafts of the region's Hazard Mitigation plans were complete and available for public comment and review on the Commission's website (www.pvpc.org). This press release (Appendix F) resulted in a series of news articles (Appendix F) that further enhanced awareness of the Hazard Mitigation Planning Process. The City of Northampton was a key component of this outreach effort, as many of the officials quoted were from this community.

On November 20th, 2007 the Pioneer Valley Planning Commission Presented the planning process that led to the creation of the Eas*thampton Local Natural Hazards Mitigation Plan*. The Western Regional Homeland Security Council is the planning entity responsible for orchestrating the homeland security planning activities of Berkshire, Franklin, Hampden and Hampshire Counties. Collectively, this body is responsible for 101 communities.

Additionally, the Hampshire Regional Emergency Planning Committee was presented with the findings of this plan during its November15, 2007 meeting. Prior to this briefing, the HREPC was provided with updates of the Hazard Mitigation Planning Process on April 20, 2007 and again on December 21, 2006.

Also, on September 23, 2007 the Republican Newspaper, based in Springfield, ran an article about the Pre-Disaster Mitigation Plans which included a solicitation of comments on the plans from the public. A copy of the article is included in Appendix B.

2 – LOCAL PROFILE

Community Setting

Easthampton is a residential and manufacturing community located below the rugged Mount Tom Range in Western Massachusetts. Maintaining a New England village character, the city's downtown remains an architecturally attractive and historically significant feature of the community.

Easthampton is located in Hampshire County within the Pioneer Valley region. It is bordered on the north by Northampton, on the west by Westhampton, on the west and south by Southampton, and on the east by Holyoke. The Mount Tom Range establishes the border with Holyoke and runs to the northeast where it runs into the Connecticut River. Easthampton is close to the urbanized core of the Springfield metropolitan area and located in the Five College area. To the west and southwest of Easthampton the city becomes more rural and less developed.

Settled around 1664 and incorporated in 1785, the municipality was an agrarian village until the mid-1800s when manufacturing became a major force in the local economy. Innovations in the manufacture of cloth-covered buttons and the use of vulcanized rubber in woven goods catapulted Easthampton into a leading industrial center. By the 1900s, large scale manufacturing located close to the Manhan River and three mill ponds were created to harness the power of the river. There were numerous factories producing yarn, thread, buttons, and elastic. The mills attracted skilled workers from England, Germany, Ireland, Poland, and Canada. Major plants in Easthampton include National Nonwovens and Tubed Products, Inc. The large companies fared well into the early part of the 20th century. But by the 20th century's end, many of Easthampton's factories had downsized, closed or relocated due in part to increasing global competition. The Eastworks mill building has found new life as a mixed-use facility housing apartments, stores, and restaurants

Commercial development is primarily located along the major transportation spines: from Route 141 to Cottage and Union Streets terminating at the downtown center at Main Street, and along Route 10 connecting to Northampton. Housing choices range from apartments to single family homes in rural settings. Approximately 60% of the homes are owner-occupied. Easthampton continues to have a significant manufacturing and industrial base compared to its more agrarian neighbors. The arts and cultural scene has flourished in recent years, attracting artists and small entrepreneurs.

The Massachusetts Audubon Society manages the Arcadia Wildlife Sanctuary in Easthampton which provides educational programs for adults and children. The Manhan River flows through the center of city and there is fishing on Nashawanuck Pond. Nonotuck Park contains 94 acres for outdoor recreation. Easthampton is also home to the Williston Northampton School, a private secondary co-educational college preparatory school.

The Manhan River runs from Westhampton and Northampton, through Southampton, as it approaches Easthampton where it terminates at the Oxbow, a major recreational destination. Nearby is the Arcadia Wildlife Sanctuary. The Manhan Rail Trail now runs almost the width of the city, from close to the Southampton line to the Oxbow. Design is underway for a connection to the Northampton Bikeway and it is hoped that one day a connection to the southwest will be constructed. The other major regional natural resource is the Barnes Aquifer. This sole source aquifer supplies water to Easthampton, Southampton, and Westfield. The aquifer is located in those three communities plus Northampton and Holyoke.

Infrastructure

Early in Easthampton's history, development cropped up along the waterways because they served as the power source for the burgeoning industry along the Manhan River to the area by the man-made Lower Mill Pond. In the post-war residential boom years, more suburban style development arrived in Easthampton. Subdivisions and associated infrastructure were developed in the south of the city and towards the northeast corner. The steep slopes of the Mt. Tom Range serve to limit development, but the lower slopes have seen development paralleling East Street.

Roads and Highways

Major transportation routes include Interstate-91, Route 10, Route 5, and Route 141. Route 10, or Northampton Street, travels in a southwesterly direction from the Northampton city line into neighboring Southampton. Route 141, also known as Holyoke Street, or Mountain Road, begins in the center of the city and bisects the city from north to south. Interstate-91 and Route 5 travel north-south through the northeastern-most corner of the city limits and parallel to the Connecticut River.

Rail

There is a local rail line which travels through city, mostly along Route 5. There was also an abandoned utility rail line as well, which was recently converted to the Manhan Rail Trail.

Public Transportation

Within Easthampton, there is both fixed route transit service, provided by the Pioneer Valley Transit Authority (PVTA), and door-to-door accessible van service (paratransit) for elderly and disabled residents.

Water and Sewer

The City of Easthampton provides public water and sewer service. The Barnes Aquifer is a sole source aquifer supplying drinking water to Easthampton through five active wells. In 2003, the Department of Environmental Protection conducted a Source Water Assessment and Protection Report (SWAP), identifying current protection efforts, threats to the aquifer, and recommendations. Easthampton has implemented an Aquifer Protection overlay district which covers a portion of the Zone II (groundwater recharge area) and limits the type of uses and

materials allowed in the zone. There are, however, preexisting uses that are grandfathered and therefore exempt from the ordinance. In conjunction with the neighboring communities that also contain portions of the aquifer and the Pioneer Valley Planning Commission, the Barnes Aquifer Protection Advisory Committee (BAPAC) conducts outreach, education, and review of proposed developments in the recharge area.

In addition, the City is actively working toward implementing a stormwater management plan to meet NPDES Phase II requirements. The municipal wastewater treatment plant was recently upgraded.

Schools

Public schools serving Easthampton include Center, Pepin, and Maple Elementary Schools, Parsons Street School, White Brook Middle School, and Easthampton and Tri-County High Schools. Easthampton is also home to the Williston Northampton School, Notre Dame-Immaculate Conception School, and Calvary Baptist School.

Natural Resources

The following in the Natural Resources section include excerpts from the Easthampton Open Space and Recreation Plan Element of the city's Community Development Plan.

A trip through Easthampton includes a drive in the country, a view from a mountaintop, and a glimpse across a river. The features that set Easthampton apart from the surrounding cities and towns include its natural resources: the Oxbow and the Mount Tom Range, the farmlands found in the Park Hill and East Street areas, and the ponds in the center of city. This combination of ponds, open fields, and the mountain range create a landscape that is uniquely Easthampton.

Topography

The Mt. Tom Range forms the backdrop and southeast boundary of Easthampton. Its steep slopes have precluded development throughout its history while the level rolling landscape at its base has served as farmland and, more recently, sites for residential development. Glacial sculpting 11,000 to 1.8 million years ago molded the steep western face of the Mt. Tom Range. Great sheets of ice estimated to have a thickness of up to two miles, scraped and wore deep grooves into the range. As the glaciers retreated, Lake Hitchcock formed. Dried up long ago, this huge body of water left behind alternating layers of fine sands, silts, and clay deposits in its bed. These stratified deposits provide the conditions conducive to the formation of aquifers. The Manhan River and its tributary streams carved valleys and terraces into the deep, varied glacial deposits of sand, gravel, silt, and clay and left recent alluvial deposits within their floodplains.

Water Resources

Watersheds

Easthampton is part of the Connecticut River Watershed and more specifically, the Manhan River subwatershed. In Easthampton, the Manhan River is the main tributary stream to the Connecticut River. The North Branch of the Manhan, Hannum Brook, and Basset Brook flow into the Manhan from the north. From the south, Broad Brook, White Brook, Wilton Brook and Brickyard Brook flow into a series of man-made ponds in the center of city. These waters eventually reach the Manhan River about a mile above where it empties into the Oxbow, and thence into the Connecticut River itself.

Surface Waters

The pond system in Easthampton was created to supply industrial waterpower early in the city's history. There are three distinct waterbodies:

- Nashawannuck Pond, which receives water from the Broad, Wilton and White Brook watersheds;
- Upper Mill Pond or Rubber Thread Pond, which is fed by the Wilton Brook; and
- Lower Mill Pond, which drains tributaries to the Manhan River and is fed by the Plum and Brickyard Brook watersheds.

The high rates of development and corresponding increase in impervious surfaces in the Nashawannuck Pond watershed has led, over the years, to water quality and aesthetic problems with the Pond. A number of measures have been taken to improve water quality in Nashawannuck Pond over the last decade and a half. Weirs and basins have been installed in White and Broad Brook to address sedimentation problems. Outreach to homeowners on the importance of riparian buffers and erosion control has been undertaken. Also, the permitting process for dredging the pond is currently underway. Dredging is necessary to remove the sediment accumulated in the pond. In addition to filling in the pond, the sediment contains high levels of nutrients. These nutrients lead to excessive growth of aquatic plants and eutrophication that interfere with boating, swimming and visual enjoyment of the pond.

Aquifer Recharge Areas

A delineation of the Zone II area was completed for the Hendrick St. Wellfield. A Zone II area is defined by the Massachusetts Department of Environmental Protection as the area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated. This delineation serves as the foundation for the City's Aquifer Protection Overlay Zone.

Wetlands

The bulk of wetlands in Easthampton are the floodplains of the Manhan River. There are also pockets of wetlands scattered throughout the city, including marshes and shrub swamps off of Florence Road and around Bassett Brook and a large amount of marshland located in and around the Oxbow. These wetlands and floodplains are important for their natural resource and their economic value to the community. They provide flood storage, pollution filtration and habitat for wildlife. Development on wetlands and flood plains impairs their function and causes costly and sometimes irreparable damage to people, property, and wildlife. Vernal pools, temporary pools

of water which form in the spring and usually dry up in the summer, are another important wetland resource. They are particularly important habitat for amphibians. Few vernal pools have been certified in Easthampton, leaving these resources vulnerable to impacts as they may not be easily identified during other seasons of the year.

Vegetation

Easthampton's vegetation is characteristic of the Connecticut River Valley region. The Northern Hardwood forest type meets the Oak-Hickory forest type in this area of western Massachusetts. The presence of this transition zone, along with the land-use history of Easthampton, contributes to a diversity of plant species.

Forest

Forests once covered the area, but were harvested and cleared in the late 1700s to make way for farming. The slopes of the Mount Tom Range, the protected lands of the New England Forestry Foundation and stretches of land along the Manhan River are among the areas where forests of significant size are currently found. Forest land in Easthampton typically tends toward mixed hardwoods. Coniferous stands, generally hemlock and white pine are found along the Mt. Tom range and in stream valleys as well as in old fields. Pockets of pitch pine are found in the sandy soils of the southern part of city.

In Arcadia Wildlife Sanctuary, several types of trees and shrubs including dogwood, crab apple, honeysuckle, and apple provide food and shelter to wildlife, especially birds. In the fall and winter, the ripened fruits and berries attract and sustain a variety of bird species.

Agricultural Land

Agricultural crops such as corn and hay as well as apple orchards comprise the majority of vegetation from north of Plain Street to the Nonotuck Park area and from the Manhan River to Northampton. A few small-scale vegetable farms and now a community supported agriculture farm called “Mountain View Farm” are found throughout city. Several farms along East Street have been converted to residential use in recent years. In addition to the economic contribution, farms and fields also provide historic and scenic value to the city.

Wetland Vegetation

Several types of wetlands are found in Easthampton: wet meadows, marshes, shrub, and forested wetlands as well as the Oxbow. A few types of floodplain forest communities flourish in the lands along the Oxbow, on the banks of the Manhan, and along its tributaries. Species found in these areas include green ash, sycamore, red and silver maple, and American elm. Arcadia Wildlife Sanctuary and the Pascommuck Conservation Trust and have taken measures to preserve the lands on which these wetland species grow by purchasing and preserving strips along both the Oxbow and Manhan River.

Rare, Threatened and Endangered Species

Under the BioMap project, the Massachusetts Natural Heritage and Endangered Species Program has conducted analysis of habitat areas critical to the success of rare plant and animal communities. The two areas most important to the long-term viability of such species are the Mt. Tom range and the Manhan River/Oxbow.

Scenic Resources and Unique Environments
Excellent views of and from the range are found throughout Easthampton. The view from Nashawannuck Pond in the center of city continues to define Easthampton. The East St. area, in its location at the base of the range provides a close-up view of the range while wide-angle vistas are found in areas along Park Hill in the northwestern corner of the city. Also interesting are the glimpses of the mountain that can be caught unexpectedly. These are common as one enters Easthampton from Route 10.

Development in Easthampton

Development Patterns
Several factors have played, and will continue to play, an important role in the development of Easthampton. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, poor soil conditions, land set aside for conservation, the Manhan and Connecticut Rivers, their tributaries and floodplains; and the availability of utilities such as public water and sanitary sewers. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Zoning and other land use regulations constitute a city's "blueprint" for its future. Land use patterns over time will continue to look more and more like the city's zoning map until the city is finally "built out"—that is, there is no more developable land left. Therefore, in looking forward over time, it is critical that the city 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 city's zoning map and zoning bylaws. Zoning is the primary land use tool that the city 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 city's character.

Easthampton has 11 base zoning districts and four overlay districts. The base districts define the allowed uses and dimensional requirements in all parts of the city, while the overlay districts provide for additional restrictions in certain areas. These districts are described below.

Residential - Rural A (R-80): Single family, aquifer district
Residential - Rural B (R-40): Single family, aquifer district
Residential - Rural C (R-35): Single family
Residential - Suburban A (R-15): Single and 2 family
Residential - Suburban B (R-10): Single and 2 family
Residential – Urban (R-5): Multifamily
Downcity Business (DB): Commercial, mixed
Highway Business (HB): Commercial, planned mixed
Neighborhood Business (NB): Mixed
Industrial (I): Industrial
Mixed Use/Mill Industrial (MI): Mixed
Aquifer Protection Overlay Districts (AP): Protects aquifer

Floodplain and Manhan River Protection Overlay Districts (FL): 300 foot area around river
Telecommunications Overlay Districts (TC): Industrial, business and city owned land for telecommunications
Transfer of Development Rights Overlay Districts (TDR): Sending and receiving zones to protect key open lands.

Current Development Trends
Easthampton's landscape is a diverse combination of steep hills, river valleys, and wetlands with the hills mostly on the east and west boundaries and a relatively flat center. Seventeen percent of Easthampton's land is permanently protected, and a total of two % has some kind of protection. The land is approximately 35% forestland most of which is fragmented except along the eastern border where Mt. Tom State Reservation is located and in the northwestern corner of the city. Most parts of Easthampton are at least partially developed with the most concentrated development along and adjacent to Routes 10 and 141 and in the southwest corner. The least developed areas are along much of the northern and eastern borders and are undeveloped primarily because of steep slopes, streams and wetlands, or protected lands.

Today, this community is home to approximately 15,537 residents in 6,854 households with 61% of the homes being owner occupied. The average commute time for Easthampton residents is 39 minutes (one way) so people spend a lot of time on the road. Development has been accelerating in Easthampton with approximately 210 building permits issued in the past 3 years.

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 (number) structures (number 1-4 family homes and number "other structures") located within the Special Flood Hazard Area (SFHA) in Easthampton as of May 6, 1999, the most current records in the CIS for the City of Easthampton.

National Flood Insurance Program (NFIP)
Easthampton is a participating member of the National Flood Insurance Program. Flood Insurance Rate Maps, all bearing the effective date of August 15, 1989, are used for flood insurance purposes and are on file with the Easthampton Planning Board. As of August 2005, there were 13 policies (5 for 1-4 Family structures and 8 for other structures) in effect in Easthampton for an estimated total of $2,944,500 (based on the median home value in Easthampton) worth of insurance. There are currently no "Repetitive Loss Properties" insured under the NFIP within the City of Easthampton.

3 – HAZARD IDENTIFICATION & ANALYSIS

Natural Hazard Identification

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

Floods

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

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

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

In contrast, *general flooding* events may last for several days. Excessive precipitation within a watershed of a stream or river can result in flooding particularly when development in the floodplain has obstructed the natural flow of the water and/or decreased the natural ability of the groundcover to absorb and retain surface water runoff (e.g., the loss of wetlands and the higher amounts of impervious surface area in urban areas).

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

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. Flooding along the Manhan River and Oxbow is frequently a problem in Easthampton.

Severe Snowstorms/Ice Storms

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

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

Hurricanes

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

Tornadoes

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.[1]

Microbursts and tornadoes are not uncommon in the region, and they are expected to become more frequent and more violent as the earth's atmosphere warms, due to predictions of climate change from global warming. In the last fifty years, no known tornados have touched down in Easthampton, but there have been several high-wind storms and hail events. In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath within close proximity of Easthampton, known as "tornado alley."

Wildland Fires/Brushfires

According to FEMA, there are three different classes of wildland fires: *surface fires*, *ground fires* and *crown fires*.[2] The most common type of wildland fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is usually started by lightening. Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions. While wildland fires have not been a significant problem in Easthampton, 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.

Since 2001, there were 62 brushfires reported in Easthampton. As a point of comparison, Easthampton Fire Department issues between 800-900 burn permits annually to Easthampton residents.

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

Earthquakes

An earthquake is a sudden, rapid shaking of the ground that is caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly, without warning, at any time of the year. New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.[3] 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.[4]

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

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

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

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

Table 3-2
New England States Record of Historic Earthquakes

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

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

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

Dam Failure

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

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

The Massachusetts Department of Conservation and Recreation (MA DCR) was the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the

implementing regulations 302 CMR 10.00). Until 2002, DCR was also responsible for conducting dam inspections but then state law was changed to place the responsibility and cost for inspections on the owners of the dams. This means that individual dam owners are now responsible for conducting inspections.

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.

The Massachusetts Emergency Management Agency (MEMA) identifies seven (7) dams in Easthampton.

It is also important to consider and plan for the potential critical failure of dams upstream in Southampton, Westhampton, and Northampton.

Drought

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

In Massachusetts, six major droughts have occurred statewide since 1930[5]. 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.

[5] US Geological Survey Water-Supply Paper 2375. "National Water Summary 1989 – Floods and Droughts: Massachusetts." Prepared by S. William Wandle, Jr., US Geological Survey.

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

When evaluating the region's risk for drought on a national level, utilizing a measure called the Palmer Drought Severity Index, Massachusetts is historically in the lowest percentile for severity and risk of drought.[6] However, global warming and climate change may have an effect on drought risk in the region. With the projected temperature increases, some scientists think that the global hydrological cycle will also intensify. This would cause, among other effects, the potential for more severe, longer-lasting droughts.

Man-Made Hazards – Hazardous Materials

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

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.[7] According to TRI, there are five manufacturers who have released hazardous materials within Easthampton's city limits, they are identified in Table 3-9.

In addition, 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.

Natural Hazard Analysis Methodology

In order to review the likelihood of a specific hazard occurring, to identify the location of occurrence, and to assess the impacts of the hazard event, a *Hazard Identification and Analysis Matrix* was prepared to organize the information that was gathered for this project. The matrix is organized into the following sections: Type of Hazard, Frequency of Occurrence, Severity of Impacts and Hazard Index. The Hazard Index was completed to rank the hazards according to

[6] National Drought Mitigation Center – http://drought.unl.edu

[7] 2004 Toxic Releases Inventory (TRI) Data Files for Massachusetts. www.epa.gov/tri/

the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each of the matrix categories is provided below. The completed Matrix is shown on Table 3-7.

Type of Hazard

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

Frequency of Occurrence

The frequency or likelihood of occurrence for each natural hazard was classified according to the following scale and is based on historical frequency of occurrence:

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

Frequency of Occurrence	Annual Probability
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

Source: Adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002

Location of Occurrence

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

Table 3-4
Location of Occurrence and Percentage of City Impacted of Given Natural Hazard

Location of Occurrence	Percentage of City Impacted
Large	More than 50% of the city affected
Medium	10 to 50% of the city affected
Small	Less than 10% of the city affected

Source: Adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002

Severity of Impacts

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

Table 3-5
Severity of Impacts and Magnitude of Multiple Impacts of Given Natural Hazard

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

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

Hazard Index

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

Table 3-6
Hazard Identification and Analysis Worksheet for Easthampton

TYPE OF HAZARD	FREQUENCY OF OCCURRENCE	LOCATION OF OCCURRENCE	IMPACT	HAZARD RISK INDEX RATING
Flooding	**Very High**	**Small**	**Minor**	**5**
Severe Snowstorms/ Ice Storms	**Moderate**	**Large**	**Limited**	**3**
Hurricanes / Severe Wind	**Low**	**Large**	**Critical**	**2**
Tornadoes / Microburst	**Low**	**Medium**	**Limited**	**2**
Wildfire/Brushfire	**Very High**	**Small**	**Minor**	**5**
Earthquakes	**Very Low**	**Large**	**Minor**	**5**
Dam Failures	**Very Low**	**Small**	**Minor**	**5**
Drought	**Low**	**Large**	**Minor**	**5**
Man-Made Hazards: Hazardous Materials	**Moderate**	**Medium**	**Limited**	**2**

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

Vulnerability Assessment

In order to determine estimated losses due to natural and man made hazards in Easthampton, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The value of all structures in the City of Easthampton, including exempt structures such as schools and churches, is $1,367,635,376 as of FY2006. The median value of a home in Easthampton is $226,500 as of FY2006. The data below was calculated using HAZUS-MH, as well as FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses, August 2001. In addition, the Committee completed the Vulnerability Assessment Worksheets which provided more data to estimate the potential losses.

Past and Potential Hazards

This section will describe the location, extent, previous occurrences, and probability of future events for hazards that were identified in Easthampton

Flooding (100-year base flood): Medium Risk

Location
The 100-year flood zone covers mostly narrow bands of level floodplain land along the Manhan River (Main and North Branch), Basset Brook, Broad Brook, the Connecticut River and Nashawannuck and Lower Mill Pond. In several areas, the flood zone widens out to encompass farmland, some residential land, and industrial lands. The specific areas noted below are subject to annual flooding and all are located within the 100-year flood plain

Lower Fort Hill Road
This area is located near the confluence of the Manhan River and the Oxbow of the Connecticut River, and floods annually. No structures could be affected by a flood incident here, therefore there would be no cost to repair or replace structures. Cost for repairing or replacing any dams or bridges, power lines, telephone lines, and contents of structures are not included.

- Flooding occurs in this area annually.
- No structures affected by flood conditions

West Street
The portion of West Street that floods annually is adjacent to the confluence of the Hannum Brook and the Manhan River. Approximately two (2) structures could be affected by a flood incident in this location. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be $453,000. Cost for repairing or replacing any dams or bridges, power lines, telephone lines, and contents of structures are not included.

- Flooding occurs in this area annually.
- Potential damage / repair to road surface

Meadowbrook Drive

This street runs parallel to the Manhan River floodplain. Approximately 12 single family homes could be affected by a flood incident here. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be $2,718,000. Cost for repairing or replacing any dams or bridges, power lines, telephone lines, and contents of structures are not included.

- A portion of Meadowbrook Drive is in the FEMA 100-year and 500-year floodplain.
- Flooding occurs in this area annually.
- Potential for damage / repair to road surface.

Extent

There are approximately 722 acres of land within the FEMA mapped 100-year floodplain and 172 acres of land within the 500-year floodplain within the City of Easthampton. According to the Community Information System (CIS) of FEMA, there were five (5) 1-4 family structures and eight (8) "other" structures located within the Special Flood Hazard Area (SFHA) in Easthampton as of August 10, 2005, the most current records in the CIS for the City of Easthampton. Utilizing the City's median home value of $226,500, a preliminary damage assessment was generated. For the estimated number of people living in the floodplain, an average household size of 2.3[8] people was used.

A total of 13 structures are located within the SFHA in Easthampton, totaling approximately $2,944,500 of damage, and 30 people impacted. The damage estimate is a rough estimate and likely reflects a worst-case scenario. Computing more detailed damage assessments based on assessor's records is a labor-intensive task and beyond the scope of this project.

Previous Occurrences

Flooding other than that noted above has been relatively rare in Easthampton

Probability of Future Events

The risk of flooding in a 100-year floodplain is 1% in any given year.

Severe Snowstorms/Ice Storms: Medium Risk

Local officials judge Easthampton to be at medium risk for blizzards and other types of severe winter storms. Winter Storms are the most common and most familiar of Bay State hazards which affect large geographical areas. The majority of blizzards and ice storms in the Commonwealth cause more massive inconvenience than they do serious property damage, injuries, or deaths. However, periodically, a storm will occur which is a true disaster, and necessitates intense, large-scale emergency response.

Location

The entire City of Easthampton is susceptible to severe winter storms.

The following areas have been identified as areas where snow drifts form during winter storm events:

[8] Figure courtesy of 2000 U.S. Census.

- Florence Road
- Ballard Street
- Lyman Street
- O'Neill Street
- East Street
- Line Street, near Phelps Street
- Park Hill Road
- Plain Street
- Oliver Street
- Clark Lane
- Fort Hill Road
- Clapp Street

Extent

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10 inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

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

Previous Occurrences

- Easthampton has been subject to 22 winter storms categorized as major to extreme according to the NESIS scale since 1960. Additional historically significant winter storms to affect Easthampton include the Great Snow of 1717 and the Blizzard of 1888
- Moderate risk city wide due to snow, ice and extreme cold.
- 1969 heavy snow - several 3 feet events.
- 1988 temperature below 0 degrees for a month (Nov.-Dec.).

Probability of Future Events

Based on the NESIS scale, Easthampton is at risk of a major to extreme winter storm in any given year is slightly less than 50 percent.

Hurricanes/High Winds: Medium-Low Risk

The City has a moderately low risk for hurricanes and other types of severe warm weather wind and rain storms. The power outages which often accompany such storms are considered a moderately low risk threat to the city. The City has experienced small blocks of downed timber

and uprooting of trees onto structures in past hurricanes. Hurricanes can and do create flooding. Estimated wind damage 5% of the structures with 10% damage $13,676,354. Estimated flood damage 10% of the structures with 20% damage $6,838,177. Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

Location

Massachusetts is susceptible to hurricanes and tropical storms. Between 1851 and 2004, approximately 32 tropical storms; five Category 1 hurricanes, two Category 2 hurricanes and three Category 3 hurricanes have made landfall. All of Easthampton is at risk from the effects of a hurricane, but its inland location makes it less susceptible to wind damage than flood damage resulting from a strong storm surge.

- Connecticut and Manhan River corridors at risk.

Previous Occurrences

- 1938 hurricane was a major event - wind damage and flooding statewide.
- Hurricane Diane in 1955 (a tropical storm when it reached Massachusetts) caused significant damage to Cottage Street dam and mill complex, and washed out Route 141

Table 3-7 Major Non-Winter Storms to Affect Easthampton Area since 1900

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

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low frequency of major hurricanes in Easthampton (once every fifty years is less than a one percent chance of any such storm occurring in a given year) while the possibility of a less severe hurricane or tropical storm affecting Easthampton in any given year is approximately 10 percent.

Tornadoes/ Microburst: Medium-Low Risk

Location

The hazard area for tornadoes in Easthampton varies according to the intensity and size of the tornado. There have not been enough tornadoes in Easthampton to accurately predict sections of town that are more likely to experience a tornado.

Extent

Risk of tornadoes is considered to be low in Hampshire County. Tornadoes rarely occur in this part of the country; therefore, assessing damages is difficult. Microbursts, while not frequent, are more common. Buildings have not been built to Zone 2, Design Wind Speed Codes. Estimated damages to 10% of structures with 20% damages $27,352,708. Estimated cost does not include building contents, land values or damages to utilities.

Previous Occurrences

- No known tornado activity in Easthampton
- 9 incidents of tornado activity (F3 or less) occurred in Hampshire County from 1954 to 2006.
- Microburst occurred in 1997 along Kimberly Lane, Campbell Drive, and Jones Drive – damage included over 100 trees downed, and 6 homes damaged.

Probability of Future Events

Given the low number of previous recorded occurrences the probability of future events is considered to be medium to low.

Wildfires/Brush Fires: Low Risk

Location

The following areas have been identified as potential wildfire areas in Easthampton:

Christopher Clark Road

Moderate risk exists for potential wildfire incidents in this area of the city, which is within to Mount Tom State Reservation. There are no structures along this road that could be affected by a wildfire incident. There are about 410 acres of forested land in this area.

- Forested areas with high fuel content have more potential to burn.
- Risk increases for wooded areas with higher elevation.
- Limited access for reaching some areas if a wildfire occurs in this area.

Nonotuck Park

Low risk exists for potential wildfire incidents in the city's main recreational park. There are two drinking water supply pumps and six (6) Park and Recreation buildings in the park. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be $2,400,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Forested areas with high fuel content have more potential to burn.

Extent

Easthampton is approximately 35% forestland most of which is fragmented except along the eastern border where Mt. Tom State Reservation is located and in the northwestern corner of the city.

Previous Occurrences

Easthampton has averaged slightly more than 10 brushfires per year since 2001, which as far back specific records were available. No damage to structures or people was associated with

these brushfires. There is no record, recorded or anecdotal of wildfires in Easthampton.

Probability of Future Events
Based upon the availability of data, there is a low frequency of wildfires in Easthampton.

Earthquakes: Low Risk

Location
In the event of an earthquake, all of Easthampton would be affected with some portions more impacted than others, depending on the magnitude of the earthquake and the underlying population density.

Extent
Like the rest of Massachusetts, Easthampton is at low risk (FROM CEMP) for earthquake occurrence and impact. Structures are mostly of wood frame construction estimated loss 20% of city assessed structural valuation $273,527,075. Costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures are not included.

Previous Occurrences
Nineteen earthquakes, intensity V (Modified Mercalli scale) or greater, have centered in Massachusetts since it was colonized by Europeans. A shock in 1755 reached intensity VIII at Boston and was felt across the State. In addition, Massachusetts was affected by some of the more severe Canadian shocks plus the earthquake of 1929 that centered on Grand Banks of Newfoundland.

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

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

Probability of Future Events
Based upon the availability of data, there is a low frequency of earthquakes in Easthampton with a between a 1% and 2% chance of an earthquake occurring in any given year.

Dam Failure: Low Risk

Location
The City of Easthampton has 7 dams on public and private land. Refer to the Hazard Mitigation Map (Appendix E) for their locations.

Extent

Dams in Massachusetts are assessed according to their risk to life and property. Dams with a *Low Hazard* rating may cause minimal property damage with no expected loss of life; *Significant Hazard* dams 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; *High Hazard* dams will most probably cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads. The following dams have the following ratings:

Table 3-8: Easthampton Dams, Classified by Hazard Risk

Dam	Hazard Risk
Lower Mill Pond Dam	Significant
Nashawannuck Pond Dam	Significant
Easthampton Waterworks Dam	Significant
Brakeys Pool Dam	Low
Coleman Pond Dam	Low
Pine Valley Pool Dam	Low
Williston Academy Pond Dam	Low

Source: Massachusetts Emergency Management Agency (MEMA)

Previous Occurrences

To date, there have been no records of dam failures in Easthampton.

Probability of Future Events

As Easthampton's high hazard dams age, and if maintenance is deferred, the likelihood of a dam bursting will increase, but, currently the frequency of dam failures is very low with a less than one percent chance of a dam bursting in any given year.

Drought: Low Risk

Location

A drought would impact all of Easthampton. Water-intensive uses such as agriculture and industries would be more impacted than other sectors of the city.

Previous Occurrences

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. Easthampton has had limited experience with severe drought conditions. Drought will increase the risk of wildfire, especially in areas of high recreational use and as more timberland is set aside as non-harvested timberland, the potential for the risk of wildfire will increase.

No restrictions on water use in Easthampton have been instituted since about 1980. This is largely due to various mills which used large amounts of water having left the city. Water use has continued to decrease, per capita, since that time.

Probability of Future Events
In Easthampton, as in the rest of the state, drought occurs at a medium frequency, with a range of a 1% or a 10% chance of drought occurring in a single given year. However, due to the decrease in water use in Easthampton over the last quarter century and the water richness of Western Massachusetts Easthampton is unlikely to be adversely affected by anything other than a major, extended drought.

Man-Made Hazards - Hazardous Materials: Medium-High Risk

Easthampton relies on the Fire Department for responding to incidents involving hazardous materials. Easthampton's location on Routes I-91, 5/10, 141 and a rail line puts it at high risk for hazmat-related highway and rail accidents. The community rates the potential for hazardous materials accidents at fixed sites as a moderately high risk.

Location
Ten (10) sites in the City of Easthampton are U.S. EPA Tier II Hazardous Material sites and are listed in Table 3-9 below. The first five listed have had recorded releases of hazardous materials.

Table 3-9: Easthampton Tier II Hazardous Material Sites

Industry	Address	Recorded Toxic Chemical Release (Y/N)
National Felt Company, Inc.	110 Pleasant Street	Y
National Nonwovens (Mechanic Street factory)	27 Mechanic Street	Y
National Nonwovens (Pleasant Street factory)	180 Pleasant Street	Y
Palmer Paving Corporation	23 Arthur Street	Y
STIK-II Div.	41 O'Neill Street	Y
Hathaway Construction Corp	20 Arthur St	N
Verizon	6 Railroad St	N
Fedor Oldsmobile Pontiac, Inc	228 Northampton St	N
Tubed Products	44 O'Niel St	N
City of Easthampton Waste Water Treatment Plant	5 Gosselin Way	N

Source: 2004 TRI Data Files for Massachusetts

Extent
The extent of hazardous chemical release is not predictable as it is dependent on the location including whether it is from a stationary or moving source, amount and type of chemical released, and weather conditions at the time of the release.

Previous Occurrences
Available data dating to 1998 shows an average of 1-2 releases of hazardous materials from these sites per year with no property damage or loss of life associated with these releases.

One release of hazardous materials from accidents on the highways and rail lines in Easthampton has been recorded in recent years. A traffic accident in 2005 caused the release of about 200 gallons of used automobile anti-freeze.

Probability of Future Events
Given available data there are likely to be 1-2 releases of hazardous chemicals each year however the likelihood of a catastrophic release is very low.

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

4 – CRITICAL FACILITIES

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

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

Critical Facilities within Hazard Areas

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

The Critical Facilities List for the City of Easthampton has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Easthampton'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 Easthampton. 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 Map at the end of this Plan identifies these facilities.

Category 1 – Emergency Response Services

The City 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
Public Safety Complex – 32 Payson Ave.

2. Fire Station
Easthampton Fire Department – 32 Payson Ave.

3. Police Station
Easthampton Police Department – 32 Payson Ave.

4. Highway Garage
30 Northampton Street

5. Water Department
Water Treatment Plant –. 109 Hendrick St.

Wastewater Treatment Plant –Gosselin Dr

6. Emergency Fuel Stations
30 Northampton Street (proposed)

7. Emergency Electrical Power Facility
None

8. Emergency Shelters
White Brook Middle School – 200 Park St.
Easthampton High School – 70 Williston St.
Williston-Northampton – 19 Payson St.
Parsons Street School – 48 Parsons St.
Maple Street School – 7 Chapel St.
Pepin School – 4 Park St.
Center Street School – 9 School St.

9. Dry Hydrants - Fire Ponds - Water Sources
None

10. Transfer Station
30 Northampton Street

11. Utilities
Electrical Substations – East Street, Phelps Street
Telephone Switching Station – Railroad Street

12. Helicopter Landing Sites
None

13. Communications
Radio Antennae – Ferry Street, City Hall, 180 Pleasant Street (National Non-Wovens)
Cable Tower – 90 Loudville Road

14. Primary Evacuation Routes
Route 141 (Holyoke Street), Route 10 (Northampton Street), East Street, Loudville Road

15. Bridges Located on Evacuation Routes
Manhan River Bridge, Route 10 (Northampton Street)
Cottage Street Bridge, Route 141
Manhan River Bridge, Loudville Road

Category 2 – Non Emergency Response Facilities

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

1. Water Supply
Public Wells – Nonotuck Park (2), Hendrick Street (2), Off of O'Neil Street

2. Water Infrastructure (Pump Stations)
Hendrick Street, Nontuck Park, O'Neill Street, Brook Street

3. Water Storage Tanks
Reservation Road, Drury Lane, Pleasant Valley

4. Sewer Infrastructure (Pump Stations)
Hendrick Street, East Street (3), North Street, O'Neil Street, Florence Road, Torrey Street, Ashley Circle, Pomeroy Meadow Road, Truehart Drive, Daley Field Road, Williston Avenue, Brook Street

5. Problem Culverts
None

Category 3 – Facilities/Populations to Protect

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

1. Special Needs Population
Riverside Industries – One Cottage Street

2. Elderly Housing/Assisted Living
Lathrop Community – 100 Russell Brook Rd.
John F. Sullivan Housing – 108 Everett St.
Frederick Dickinson CT Housing – 15 Liberty St.
Sunrise Manor – Paradise Dr.
Cliffview Manor – Lussier Circle
20 Ballard Street
31-43 Lyman Street
Treehouse Development – Easthampton Meadow

3. Recreation Areas
Nonotuck Park
Daley Field, Daley Field Road
Galbrath Field, Williston-Northampton School

4. Schools

Williston Northampton School – 19 Payson Ave.
Notre Dame Immaculate Conception School – 35 Pleasant St.
Calvary Baptist School – 412 Main St.
Tri-County High School – 199 East St.
Easthampton High School – 70 Williston Ave.
White Brook Middle School – 200 Park St.
Pepin School – 4 Park St.
Center Street School – 7 School St.
Maple Street School – 7 Chapel St.
Parsons Street School – 60 Parsons St.
Sunflower Nursery School – 186C Northampton St.
Young World Day Care – 51 Main St.
All About Children Day Care – 15A Industrial Parkway

5. Churches

Calvary Baptist Church – 413 Main Street
Easthampton Congregational Church – 112 Main Street
God Is Love Believers Church – 280 East Street
Immaculate Conception Catholic Church – 33 Adams Street
Nôtre Dame du Bon Conseil Catholic Church – 35 Pleasant Street
Sacred Heart of Jesus Catholic Church – 38 Franklin Street
Saint Philip's Episcopal Church – 128 Main Street
Trinity Lutheran Church – 2 Clark Street

6. Historic Buildings/Sites

Brookside Cemetery – Williston Ave
St. Bridget's Cemetery – Everett St.
St. Stanislaus Cemetery – Mayher St.
East Street Cemetery – off Parsons St.
Easthampton Public Library – 9 Park St.
Nashawanuck Pond Corner Cottage
City Hall, 43 Main St.
Town Lodging House – 75 Oliver St.
Nonotuck Park – Daley Field – Lownds Ave.
Historical Society – 5 Holyoke St.
Community Center – 12 Clark Street
Main Street Common / Pulaski Park – Main Street

7. Apartment Complexes

College Highway Apts. – 390 Main St.
John F. Sullivan Housing – 108 Everett St.
Frederick Dickinson CT Housing – 15 Liberty St.
Sunrise Manor – Paradise Dr.
Cliffview Manor – Lussier Circle
Lathrop Community – 100 Russell Brook Rd.

Viking Landing – 246 Main St.
Wright Homestead – 305 Main St.
180 Northampton Street
20 Ballard Street
22 Nashawannuck Street

8. Employment Centers

Riverside Industries – 1 Cottage St.
Tubed Products Incorporated – 44 O'Neil Street
National Nonwovens – 180 Pleasant Street
Big E's Foodland – 11 Union Street
October Company – 51 Ferry Street
Stik II Products – 41 O'Neil Street
Williston Northampton School – 8 Payson Avenue
Easthampton Dye Works – One Cottage Street
Easthampton Savings Bank – 36 Main Street
Helping Hand House – 216 Main Street
Philipp Manufacturing Company – 19 Ward Avenue

9. Camps

Arcadia Wildlife Sanctuary (Mass Audubon) – 127 Combs Road
Williston-Northampton School – 8 Payson Avenue
Nonotuck Park

10. Mobile Home Parks

None

The chart on the following page summarizes the critical facilities and structures in hazard areas which are located in specific areas of Easthampton. All of the other hazards, Severe Snow/Ice Storms, Hurricanes/Severe Winds, Tornadoes/Microbursts, Earthquakes, and Drought are hazards that would either affect the entire city or are unpredictable as to where they will occur (ie. Tornadoes) and therefore all existing and future critical structures and facilities can be considered to in those hazard areas.

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding (100-year Flood)	100-year floodplain along the Manhan River and The Oxbow (Connecticut River)	-- Route 5 Bridge (Northampton Street) -- Cottage Street Bridge and Dam -- Manhan River Bridge -- 2 homes Loudville Road -- 7 homes Pomeroy Meadow Dr. -- 1 water / sewer pump station -- 3 public water wells	Loudville Road Route 91 Route 5 West Street
Flooding	Meadow Brook Drive	12 single family homes	None.
Wildfires/Brushfires	Christopher Clark Road	None.	None.
	Nonotuck Park	-- 2 drinking water supplies -- 6 Park and Rec buildings	None.
Dam Failure			
Hazardous Materials	National Felt Company, Inc., 180 Pleasant Street	None.	None.
	National Nonwovens (Mechanic Street factory), 27 Mechanic Street	None.	None.
	National Nonwovens (Pleasant Street factory), 180 Pleasant Street	None.	None.
	Palmer Paving Corporation, 23 Arthur Street	9 residential homes	None.
	STIK-II Div., 41 O'Neill Street	None.	O'Neill Street

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

5 – CURRENT MITIGATION STRATEGIES

Flooding

The Floodplain Map for the City of Easthampton shows the 100-year and 500-year flood zones identified by FEMA flood maps. The 100-year flood zone is the area that will be covered by water as a result of a flood that has a one percent chance of occurring in any given year. Likewise, the 500-year flood has a 0.2 percent chance of occurring in any given year. In Easthampton, there are several floodplain areas – the most significant along the Manhan River and the Oxbow. The land is somewhat flat along the Manhan, allowing the 100-year floodplain to stretch very wide away from the banks. The Manhan's tributary streams along the western border of Easthampton also have wide floodplains. The Oxbow also has a wide floodplain because of its unique topography and because the large amount of water flowing in the Connecticut River. The other small floodplain area is along Broad Brook, which connects to the ponds in the center of the city, although it is relatively narrow.

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. Areas along the Manhan River and Oxbow are frequently subject to flooding. Over the years floods have destroyed several of the mills along the river. Now that most of the land along the river is protected and undeveloped, flooding has less potential to damage structures and is, therefore, less of a concern for the city.

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

Management Plans

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

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

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

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

Evacuation Options

The majority of land subject to the 100-year floodplain in the city, which is located along the Oxbow, Manhan River, and Broad Brook is vegetated, although there are areas of residential uses within the area as well. According to the Easthampton CEM Plan, local officials have stated that there are local shelters available for flooding victims, including people with special, non-institutional needs. In that case, the shelter is Pepin School. Approximately fifty (50) people would be expected to be impacted by a 100-year flood, of which four may need transportation.

Flood Control Structures

FEMA has identified seven (7) dams within the City of Easthampton.

Land Use Regulations that Mitigate Impacts from Flooding

The City of Easthampton has adopted several land use regulations that serve to limit or regulate development in floodplains, to manage stormwater runoff, and to protect groundwater and

wetland resources, the latter of which often provide important flood storage capacity. These regulations are summarized below and their effectiveness evaluated in Table 4-1.

Zoning By-Laws

The City of Easthampton has established a set of zoning ordinances which include several provisions that mitigate the potential for flooding, including:

Section VI: Area, Height, and Bulk Regulations

6.6 BUILDINGS IN FLOODWAY

No building, except a boathouse or pump house, shall be erected in a floodway or within ten (10) feet of any watercourse or area subject to periodic flooding, unless the first floor elevation is higher than the flood line, or unless such flood line shall have been reduced by construction of dams at the headwaters, or by other means.

7.1 FLOODPLAIN AND MANHAN RIVER PROTECTION DISTRICTS

7.11 Purpose of the District

The purposes of the Floodplain and Manhan River Protection Districts are to protect the public health, safety, and general welfare, to protect human life and property from the hazards of periodic flooding, to reduce public costs resulting from unwise individual choices of land use, to preserve the natural flood control characteristics, and the flood storage of the floodplain, and to preserve and maintain the groundwater table and water recharge areas within the floodplain, to preserve the scenic qualities, fisheries and wildlife habitat along the Manhan River and to prevent water pollution.

7.12 District Delineation

a. The Floodplain District is herein established as an overlay district:

(1) The general boundaries of the floodplain district are shown on the Easthampton Flood Insurance Rate Map (FIRM), dated August 15, 1979, as Zones A, A1 through 30, to indicate the one hundred-year flood.

(2) Within Zone A, where the one hundred-year flood elevation is not provided on the FIRM the developer/applicant shall obtain any existing flood elevation data and it shall be reviewed by the conservation committee. If the data is sufficiently detailed and accurate, it shall be relied upon to require compliance with this ordinance and the state building code.

(3) In Zone A, the best available federal, state, local, or other floodway data shall be used to prohibit encroachments in floodways which would result in any increase in flood levels within the community during the occurrence of the base flood discharge. In Zones A1-A30 and AE, along water courses that have not had a regulatory floodway designated, no new construction, substantial improvement, or other development shall be permitted unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood. In Zones A1-A30 and AE, along water courses that

have regulatory floodways designated on the Easthampton FIRM encroachments are prohibited in the regulatory floodway which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

b. The Manhan River Protection District is herein established as an overlay district:

(1) The area subject to the ordinance shall be the entire length of the Manhan River in Easthampton. The Manhan River Protection District shall encompass those floodplain areas designated as Zones A or Zone A1-30 on the City of Easthampton Flood Insurance Rate Maps (FIRM) for the Manhan River. Where the floodplain has not been delineated on the FIRM maps or where the delineation is less than 100 feet from the riverbank, the Manhan River Protection District shall be defined as that area within 100 feet, measured horizontally, of the riverbank. For purposes of this ordinance, the riverbank shall be defined as the river's mean annual high water line (see definitions).

c. The boundaries of the Floodplain and Manhan River Protection Districts shall be determined by scaling distances on the Flood Insurance Rate Map. When interpretation is needed as to the exact location of the boundaries of a District, the Building Inspector shall make the necessary interpretation.

7.13 General Use Regulations

The floodplain district is established as an overlay district to all other districts. Any uses permitted in the portions of the districts so overlaid shall be permitted subject to all the provisions of the following actions.

a. All development, including structural and non-structural activities, whether permitted by right or by special permit must be in compliance with the Wetlands Protection Act, Massachusetts General Laws, Chapter 131, Section 40, and with the requirements of the Massachusetts State Building Code pertaining to construction in the floodplains (currently Section 744), with the State Environmental Code, Title V, and must comply in all respects to the provisions of the underlying district except that where the Floodplain and Manhan River Protection Zoning imposes additional regulations such regulations shall prevail.

b. In the floodplain district no new buildings shall be erected or constructed except by special permit from the special permit granting authority, nor shall existing buildings be enlarged, moved, except as hereinafter provided. No dumping, filling or earth transfer or relocation shall be permitted, and no land or building shall be used for any purpose except hereinafter provided.

7.14 Permitted Uses

The following uses of low flood damage potential, causing no obstructions to flood flows, shall be allowed in the Floodplain and Manhan River Protection Districts, provided that they are permitted in the underlying district and they do not require structures, fill or storage of materials or equipment.

a. Agricultural uses such as fanning, grazing, truck farming, horticulture, etc.

b. Forestry and nursery uses.

c. Outdoor recreational uses, including fishing, boating, play areas, and foot, bicycle or horse paths.

d. Conservation of water, plants, wildlife.

e. Wildlife management areas, foot, bicycle, and/or horse paths.

f. Temporary non-residential structures used in connection with fishing, growing, harvesting, storage, or sale of crops raised on the premises.

g. Structures existing prior to the adoption of these provisions which conform with the provisions of the ordinances regulating underlying districts, including maintenance and repair usual for continuance of such an existing structure and improvements to such structures provided that the footprint increase of those improvements does not exceed 25% of the overall footprint of the structure. In the event such structure is destroyed said structure may be rebuilt on the same location but no larger than the original overall footprint.

h. Installation of driveways of minimum size necessary to serve areas outside the floodplain district, where other access is not feasible, provided no change in grade substantially effects purpose of this district.

7.15 Prohibited Uses in the Floodplain District

7.151 The following uses are specifically prohibited in the Floodplain District and may not be allowed by special permit:

a. The storage or disposal of any sand, gravel, rock or other mineral substance, refuse, trash, rubbish debris, or dredged spoil.

b. Draining, excavation or dredging, or removal or relocation of loam, peat, sand, gravel, soil, rock or other mineral substance, except as accessory to work permitted as of right or by special permit.

c. The storage or disposal of materials used for snow and ice control including sand, salt and other deicing chemicals.

d. The manufacture, storage or disposal of hazardous wastes, as designated by the Regulations of the Massachusetts Hazardous Waste Management Act, Massachusetts General laws, Chapter 21C, and by the U.S. Environmental Protection Agency under 40 CFR 250. e. Solid waste landfills, junkyards and dumps.

The portion of any lot within the area delineated in Section 7.12 above may be used to meet the area and yard requirements for the district or districts in which the remainder of the lot is situated.

7.16 Prohibited Uses and Restrictions in the Manhan River Protection District

7.161 The following uses are prohibited or restricted in the Manhan River Protection District:

a. No altering, dumping, filling or removal of riverine materials or dredging is permitted, except that maintenance of the river, including stabilization or repair of eroded riverbanks, erosion control or removal of flood debris, may be done under requirements M.G.L. Chapter 131, Section 40, and any other applicable laws, ordinances, and

regulations. Riverbank repairs shall be undertaken utilizing only natural materials (i.e. rock) and not with manmade materials (i.e. tires).

b. All forest cutting over 25,000 board feet at one time shall require the filing of a Forest Cutting Plan in accordance with the Mass. Forest Cutting Practices Act (M.G.L. Chapter 132, sections 40-46). In addition, no commercial cutting of forest shall occur within 50 feet of the riverbank. In the area between 50 feet and 100 feet from the riverbank, no more than 50% of existing forest shall be cut.

c. No new impoundments, dams or other water obstructions may be located within the district.

d. No private wastewater treatment facilities, including residential package treatment plants, shall discharge directly to the Manhan River.

e. No commercial earth removal or mining operation is permitted within 100 feet of the river.

f. All other uses not specifically permitted or allowed by special permit approval within the overlay zone are prohibited.

g. A buffer strip extending at least one hundred (100) feet in depth, to be measured landward from each riverbank of the Manhan River shall be required for all lots within the River Protection District. If any lot, existing at the time of adoption of this ordinance, does not contain sufficient depth, measured landward from the riverbank, to provide a one hundred foot buffer strip, the buffer strip may be reduced to 50% of the available lot depth, measured landward from the riverbank.

(1) The buffer strip shall be kept in a natural or scenic condition.

(2) No buildings nor structures shall be erected, enlarged, altered or moved within the buffer strip except as provided for in Sections 7.14 and 7.18.

h. All utilities shall meet the following standards:

(1) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

(2) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from the system into flood waters.

(3) New on-site waste disposal systems shall be located to avoid impairment or contamination from them during the flooding and shall be located no less than 150 feet from the riverbank. Replacement of existing on-site waste disposal systems shall be located as far away from the riverbank as is feasible.

7.17 Prohibited Uses in the Floodway

In Zones A1-30 and AE, along watercourses that have a regulatory floodway designated on the Easthampton Flood Boundary and Floodway Map encroachments are prohibited in the regulatory floodway which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

7.18 Special Permits

7.181 Uses by Special Permit in the Floodplain and Manhan River Protection Districts

a. No structure or building shall be erected or otherwise created or moved, except as provided in Section 7.14; no earth or other materials dumped, if excavated, or transferred, unless a special permit is granted by the Zoning Board of Appeals (ZBA). The following uses may be allowed by Special Permit from the Zoning Board of Appeals in accordance with the Special Permit regulations in Section 12.7 of this ordinance, and additional restrictions and criteria contained herein:

(1) Residential Districts

(a) Single-family residences, not including mobile homes.

(b) Residential accessory uses including garages, driveway, private roads, utility rights-of-way and on-site wastewater disposal systems.

(c) Substantial improvements to structures or buildings.

(2) Business and Industrial Districts

(a) Uses which are in compliance in all respects with the provisions of the underlying districts.

7.182 Special Permit Requirements

The Zoning Board of Appeals may issue a special permit hereunder (subject to other applicable provisions of this ordinance) only if the application is compliant with the following conditions:

a. Four (4) copies of a plan determining that the construction will be in conformance with the State Building Code (specifically those sections dealing with construction in floodplains) and will not result in increased flood heights, additional threats to safety, extraordinary public expense, create nuisances, or conflict with existing local laws. The ZBA shall provide a copy of the plan to the Planning Board, the Board of Health, Conservation Commission and shall be required to wait twenty-one (21) days for a recommendation from each board. After twenty-one (21) days the ZBA may render its decision.

b. Within Zones A1-30, where base flood elevation is not provided on the FIRM, the applicant shall obtain any existing base flood elevation data. These data will be reviewed by the Building Inspector for their reasonable utilization toward meeting the elevation or floodproofing requirements, as appropriate, of the State Building Code.

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

d. The proposed use shall comply in all respects with the provisions of the underlying district, and the Zoning Board of Appeals may require such additional requirements and

conditions as it finds necessary to protect the health, safety and welfare of the public or the occupants of the proposed use, or of the floodplain district.

e. A determination that the proposed use is in compliance with the Wetlands Protection Act, Massachusetts General Laws, Chapter 131, Section 40.

7.183 Special Permit Procedures

a. In addition to the Special Permit procedures specified in Section 12.7, the following procedures apply:

(1) The Zoning Board of Appeals shall provide notice of any hearings hereunder to the Planning Board, the Board of Health and the Conservation Commission and shall maintain a record of all special permit actions, including a finding of the reasons for their issuance and report such special permits in the annual report submitted to the Federal Insurance Administration.

b. In addition to the provisions of Section 12.7 the Zoning Board of Appeals may issue a Special Permit if it finds the proposed use is compliant with the following provisions:

(1) In the Floodplain District, proposed uses must:

(a) Not create increased flood hazards which, are detrimental to the public health, safety and welfare.

(b) Comply in all respects to the provisions of the underlying district or districts within which the land is located.

(c) Comply with all applicable state and federal laws, including the Massachusetts Building Code and the Massachusetts Wetlands Protection Act (M.G.L., Ch. 131, Sec. 40).

c. In the Manhan River Protection District, proposed uses must also:

(1) be situated in a portion of the site that will most likely conserve shoreland vegetation and the integrity of the buffer strip;

(2) be integrated into the existing landscape through features such as vegetative buffers and through retention of the natural shorelines;

(3) not result in erosion or sedimentation;

(4) not result in water pollution.

Section XII: Administration and Enforcement

12.9 SITE PLAN APPROVAL

12.95 Site Plan Approval Criteria for Approval

The Planning Board shall review the site plan and supporting data taking into consideration the reasonable fulfillment of the following objectives:

d. Adequacy of the methods of disposal and sewage and refuse and the drainage of surface and subsurface water;

e. Adequate means of protecting wetlands, watersheds, aquifers and well areas;

f. Mitigation of adverse impacts on the city's resources including the effect on the city's water supply and distribution system, sewage collection and treatment systems, fire protection and streets;

Section X: Additional Land Use Regulations

10.2 ENVIRONMENTAL PERFORMANCE STANDARDS

Any use permitted by right or special permit in any district shall not be conducted in a manner as to emit any dangerous, noxious, injurious, or otherwise objectionable fire, explosion, radio active or other hazard; noise or vibration, smoke, dust, odor or other form of environmental pollution; electrical or other disturbance; glare; liquid or solid refuse or wastes; conditions conducive to the breeding of insects, rodents, or other substance; conditions or element in any amount as to affect adversely the surrounding environment. The following standards shall apply:

10.22 Erosion Control

Erosion of soil and sedimentation of watercourses and waterbodies shall be minimized by employing the following "best management" practices:

a. Exposed or disturbed areas due to stripping of vegetation, soil removal, and regarding shall be permanently stabilized within six months of occupancy of a structure.

b. During construction, temporary vegetation and/or mulching shall be used to protect exposed areas from erosion. Until a disturbed area is permanently stabilized, sediment in runoff shall be trapped by using staked hay bales or sedimentation traps.

c. Permanent erosion control and vegetative measures shall be in accordance with erosion/sedimentation vegetative practices recommended by the Soil Conservation Service.

d. All slopes exceeding fifteen (15) percent resulting from the site grading shall be either covered with four (4) inches of topsoil and planted with a vegetative cover sufficient to prevent erosion or be stabilized by a retaining wall.

e. Dust control shall be used during grading operations if the grading is to occur within 200 feet on an occupied residence or place of business. Dust control methods may consist of grading fine soils on calm days only or dampening the ground with water.

10.23 Discharge

No discharge, at any point, into a private sewer system stream or the ground of any material in such a way, or of such a nature or temperature as can contaminate any running stream, water supply or otherwise cause the emission of dangerous or objectionable elements and accumulation of wastes conducive to the breeding of rodents or insects shall be permitted.

10.28 Stormwater Management

a. To the extent feasible, measures for run-off from impervious surfaces should be designed to meet the following objectives in an appropriate manner:

(1) prevent non-point sources pollution from urban runoff to streams, water bodies or groundwater;

(2) prevent flooding of neighboring or other down-gradient properties;

(3) promote recharge of groundwater aquifers, while preventing pollutants from entering groundwater.

Appropriate recharge or detention methods may include: detention basins; vegetated swales; filter media; oil/water separators or other similar methods. Stormwater runoff design shall be in harmony with existing regulations set forth by the City of Easthampton and the Commonwealth of Massachusetts.

10.3 FILLING OF SWALES, VALLEYS, ETC.

10.31 Applicability

No filling in of any swale, valley or other area or depression shall proceed without first securing a Special Permit from the Zoning Board of Appeals (ZBA), as specified in Section 12.7 of this Ordinance, and in accordance with the additional requirements specified herein, except where noted below.

10.311 Exceptions

The filing in of any swale, valley or other area or depression shall be exempt from this section provided all the following are compiled with:

a. A filling-in operation which does not exceed a total area of five hundred (500) cubic yards of material.

b. A filling-in operation which does not exceed a total area of ten thousand (10,000) square feet on any lot, land parcel or subdivision thereof.

c. A filling-in operation which is associated with acceptable agricultural land management practices, including, but not limited to, plowing and construction of agricultural structures; nursery operations, such as the removal and/or transplanting of cultivated sod, shrubs and trees; logging operations,

d. Filling-in operations necessary in connection with lawful construction of a building, structure, street, driveway, sidewalk, path or other appurtenance.

e. Filling, as a maintenance measure, or for landscaping purposes on existing developed lots or parcels, provided that the aggregate of area(s) affected does not exceed ten thousand (10,000) square feet, the grade change does not exceed twelve (12) inches at any point and does not alter the drainage patterns; and the filling-in does not involve a quantity of material in excess of one hundred (100) cubic yards.

10.32 Required Plans

For the filling of swales, valleys, or other area or depression not exempt under Section 10.311 of this Ordinance shall submit the following to the ZBA as part of the Special Permit process:

a. Submission of a locus plan at a scale of one inch equals eight hundred (800) feet showing the area to be filled in or excavated, lot lines within which the filling is proposed and tie-in to the nearest road intersection.

b. Submission of a site plan to a scale of one inch equals forty (40) feet of the lot and surrounding area within one hundred (100) feet showing, in addition to above, existing and proposed contour lines at intervals of not more than two (2) feet resulting from the proposed filling in, in relation to the topography of the premises, said plan to be prepared by a registered professional engineer and registered land surveyor.

10.33 Additional Requirements

The following standards shall be used as additional requirements in the Special Permit process for the filling of swales, valleys, etc. not exempt under Section 10.311 of this ordinance:

a. Provision for temporary and permanent drainage of the site.

b. Limitation of fill to terrace fills which are not to exceed ten (10) feet at any one time nor be within ten (10) feet of an adjacent lot line or any cut.

c. Regrading of all or parts of the slopes resulting from such fill.

d. Replacement of at least four (4) inches of top soil over all filled or otherwise disturbed surfaces and seeding with a perennial cover crop, reseeded as necessary to assure uniform growth and soil surface stabilization.

e. Submission of plan for lighting, if night operation is contemplated.

f. Where any fill will have a depth of ten (10) feet or more and create a slope of more than one foot in two (2) feet, there shall be a substantial fence enclosing the fill at least six (6) feet in height with suitable gates. Such fence shall be located ten (10) feet or more from the edge of the fill.

g. Provisions shall be made such that the filling in of any land area shall not impair surface drainage, constitute an erosion hazard nor act as a source of sedimentation to any adjacent land or watercourse.

h. Provisions shall be made such that the filling in of any land area does not impair the safe and efficient operation of any on-site sewage disposal or drainage facilities nor those located on adjacent properties.

i. No filling in of land shall cause or permit any soil, earth, sand, gravel, rock, stone loam, or other fill material, or water or liquid to be deposited upon or to roll, flow or work upon or over the premises of another without the express consent of the owner of such premises so affected; nor shall any filling in of land cause or permit any soil, earth, sand, gravel, rock, stone, loam or other fill material or water or liquid to be deposited, or to roll, flow, or wash upon or over any public street, street improvement, road, sewer, storm drain, water course, or right-of-way, or public property.

j. Such other conditions as may be deemed necessary and reasonable shall be imposed by the Board of Appeals in order to prevent damage to public or private property or any sewer, storm drain, or watercourse, or to prevent the filling in of land from being conducted in a manner…

Rules and Regulations for the Subdivision of Land

Easthampton's most recent draft of its Rules and Regulations for the Subdivision of Land was adopted for the purpose of "protecting the safety, convenience, and welfare of the inhabitants of the City of Easthampton by regulating the laying out and construction of ways in subdivisions providing access to the several lots therein, but which have not become public ways, and ensuring sanitary conditions in subdivisions, and in proper cases, parks and open areas." The Subdivision Rules and Regulations contain additional provisions that mitigate the potential for, and impact of, flooding, including:

Section 8: Construction Standards

8.17 Drainage

1. The construction of the drainage system, including methods of construction and quality of materials used, shall be in conformity with the Definitive Plan and Section 200 of the Standard Specifications.

2. The design capacity of the drains shall be determined by the rational method, unless the engineer exhibits satisfactory evidence that another approach is more appropriate for the specific case. The drainage boundaries of the total contributing drainage area, using a minimum of a ten (10) year design frequency storm. Where, in the opinion of the Board, flooding would produce property damage or a safety hazard, the design frequency storm shall be increased to twenty-five years. A one hundred (100) year design frequency storm shall be used for all bridge openings, major culverts, and detention areas. Drainage calculation shall be submitted with the Definitive Plan.

4. Where feasible, stormwater should be directed to enter the nearest open stream channel or detention pond. Stormwater shall not be permitted to cross any roadway upon the surface but must be piped underground. Stormwater runoff shall not be permitted to flow upon the road surface for a longer distance than three hundred (300) feet before it enters the underground system. Catch basins shall be located on both sides of the roadway on continuous grades at intervals of not more than three hundred (300) feet, at all sags in the roadway, and near the corners of the roadway at intersecting streets.

5. Proper connections shall be made with any existing public drainage system within four hundred feet (400) feet of the subdivision, if that system has the capacity to absorb the flows from the project area. Where adjacent property is not subdivided and no public drain is within four hundred (400) feet, adequate provisions shall be made for the detention of surface drainage within the boundaries of the subdivision.

6. No open water body or pond shall be filled in and no wet or swampy area shall be filled in unless it can be shown to the Board that provision has been made in the lower

drainage system to account for the removal of the storage area represented by the former wet or swampy area. In addition, permits and approval must be secured from the appropriate Town, State, and/or federal authorities.

7. Where open stream channels exist within a subdivision, adequate provision shall be made for properly maintaining them or for properly enclosing them, if absolutely necessary. It is the City's intent to preserve and maintain the natural features of such streams and any development should be planned accordingly.

18. Wherever drainage systems are located in or terminate in lands not publicly owned, proper easements in a form and content acceptable to the Board and the City Counsel shall be taken for their access. An ownership and maintenance plan shall be presented in accordance with Appendix I.

River and Stream Protection

The City of Easthampton follows the standards established by the Wetlands Protection Act, which protects water bodies and wetlands through the city Conservation Commission. The City also has instituted its Floodplain and Manhan River Protection District, an overlay district that provides restrictions on the development and use of lands either within the floodplain or within 100 feet of the Manhan River.

Easthampton Community Development Plan

The City of Easthampton has a Community Development Plan. The intent of the document is not to address hazard mitigation or flood control in a direct or comprehensive way; however, the Open Space and Recreation Element of the plan inventories the natural features and environments in the city, many of which, such as wetlands, groundwater recharge areas, farms, rivers, streams, and brooks, contain floodplain, dam failure inundation or localized flooding areas.

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

National Flood Insurance Program

The City of Easthampton participates in the National Flood Insurance Program. As of 2003, there were 22 policies in effect in Easthampton, for a total of $3,756,800 worth of insurance. The city is not a member of the Community Rating System, which entitles policyholders to a discount on flood insurance premiums. The CRS ranking is based on the steps that a city has taken to control flood losses.

The Community Rating System reduces flood insurance premiums to reflect what a community does above and beyond the National Flood Insurance Program's (NFIP) minimum standards for floodplain regulation. The objective of the CRS is to reward communities for what they are doing, as well as to provide an incentive for new flood protection activities. To participate in the CRS, a community must fill out an application and submit documentation that shows what it is

doing and that its activities deserve at least 500 points. More information including instructions and applications is available at *http://training.fema.gov/EMIWeb/CRS/m3s1main.htm*

Table 5-1: Existing Flood Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Flood Control Structures	Seven dams.	Flood inundation zones below dams	Very effective for preventing flooding downstream.	**Ensure dam owners realize their responsibility to inspect the dams.**
Zoning By-Laws				
Area, Height, and Bulk Regulations	Specific regulation prohibiting the construction of buildings within the floodplain or 10 feet of a waterway, unless the first floor is elevated above the floodline.	Lands within or near the floodplain.	Very effective for preventing flood damages to structures.	**None.**
Aquifer Protection District Overlay	Areas delineated as primary recharge areas for groundwater aquifers, and watershed areas for reservoirs are protected by strict use regulations.	Groundwater recharge areas and reservoir watersheds	Very effective for preventing groundwater contamination and for controlling stormwater runoff.	**Add Zone II to northern portion of city.**
Floodplain and Manhan River Protection District Overlay	Areas delineated as part of the 100-year floodplain, and/or within 100 feet of the Manhan River are protected by strict use regulations	100-year flood plain, area around river	Very effective for preventing incompatible development within the floodplain.	**None.**
Site Plan Approval	Specific requirements necessary for site plan approval deal with protecting wetlands and other related natural features, and water quality and supply.	Lands subject to site plan approval	Very effective for managing very specific impacts.	**None.**

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Additional Regulations	Environmental protection standards and filling standards that govern stormwater management, erosion control, and other applicable development impacts.	Entire city.	Somewhat effective for managing specific impacts, managing stormwater runoff.	**Develop Stormwater Bylaw with LID standards.**
Subdivision Regulations				
Construction Standards	Requirements for drainage.	Proposed subdivisions	Somewhat effective for managing stormwater runoff	**Consider adding infiltration requirements, impervious surface limits, etc.**
River and Stream Protection	Required enforcement of standards established by Wetlands Protection Act.	Entire city.	Somewhat effective at protecting water bodies and wetlands.	**None.**
Easthampton Community Development Plan – Open Space Element	Inventories natural features and promotes natural resource preservation in the city, including areas in the floodplain; such as wetlands, groundwater recharge areas, farms and open space, rivers, streams and brooks.	Entire city.	Effective in identifying sensitive resource areas, including floodplains. Encourages forestland and farmland protection, which will help conserve the city's flood storage capacity.	**None.**

Severe Snowstorms/Ice Storms

Winter storms can be especially challenging for emergency management personnel even though the storm has usually been forecast. 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.[9]

Management Plans

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

1. Develop and disseminate emergency public information concerning winter storms, especially material which instructs individuals and families how to stock their homes, prepare their vehicles, and take care of themselves during a severe winter storm.

2. As it is almost guaranteed that winter storms will occur annually in Massachusetts, local government bodies should give special consideration to budgeting fiscal resources with snow management in mind.

3. Maintain plans for managing all winter storm emergency response activities.

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 4-1 can also be considered as mitigation measures for severe snowstorms/ice storms.

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

1. Ensure that warning/notification, and communications systems are in readiness.

2. Ensure that appropriate equipment and supplies, (especially snow removal equipment), are in place and in good working order.

3. Review mutual aid agreements.

4. Designate suitable shelters throughout the community and make their locations known to the public.

5. Implement public information procedures during storm 'warning' stage.

6. Prepare for possible evacuation and sheltering of some populations impacted by the storm (especially the elderly and special needs).

[9] Comprehensive Emergency Management Plan for the City of Easthampton, April 2002.

7. Broadcast storm warning/notification information and instructions.

8. Conduct evacuation, reception and sheltering activities.

9. If appropriate, activate media center. Refer to Resource Manual for media center information.

10. Dispatch search and rescue teams.

11. Dispatch emergency medical teams.

12. Take measures to guard against further danger from power failure, downed trees and utility lines, ice, traffic problems, etc.

13. Close roads, and/or limit access to certain areas if appropriate.

14. Provide assistance to homebound populations needing heat, food, and other necessities.

15. Provide rescue and sheltering for stranded/lost individuals.

Restrictions on Development

There are no restrictions on development that are directly related to severe winter storms.

Other Mitigation Measures

Severe snowstorms or ice storms can often result in a small or widespread loss of electrical service. No shelters are served by a large pad-mounted generator that will provide electric power in the event of primary power failure.

State Building Code

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

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

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Special Use Regulations	Standards include street grade regulations (eight percent maximum); and intersection grade regulations	Entire city.	Effective.	**None.**
Design Standards	Standards include street grade regulations (eight percent maximum).	All Subdivisions	Effective	**None.**
Required Improvements	Utilities must be place underground	All Subdivisions	Effective for preventing power loss	**None.**
Backup Electric Power	Full power generator available at 52 Payson (Public Safety Complex); portable generator can be used at all shelters (White Brook Middle School, Tri-County, and High School)	Shelters and Public Safety Complex	Effective.	**None.**
State Building Code	The City of Easthampton has adopted the Massachusetts State Building Code.	Entire city.	Effective.	**None.**

Hurricanes/Severe Thunderstorms

Of all the natural disasters that could potentially impact Easthampton, 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).[10] 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 4-1 can also be considered hurricane mitigation measures. High winds that oftentimes accompany hurricanes can also damage buildings and infrastructure.

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

Management Plans

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

1. Develop and disseminate emergency public information and instructions concerning hurricane preparedness and safety.

2. Community leaders should ensure that Easthampton is enrolled in the National Flood Insurance Program.

3. Develop and enforce local building codes to enhance structural resistance to high winds and flooding. Build new construction in areas that are not vulnerable to direct hurricane effects.

4. Make informed decisions concerning protecting natural attributes such as beaches and dunes with breakwaters and sea walls. Review National Flood Insurance Rate Maps and Hurricane Evacuation Maps for possible impact on the community. Hurricane Evacuation Maps are available for coastal communities along Buzzard's Bay and Nantucket Sound.

5. Maintain plans for managing all hurricane emergency response activities.

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

1. Ensure that warning/notification systems and equipment is ready for use at the 'hurricane warning' stage.

[10] Comprehensive Emergency Management Plan for the City of Easthampton, April 2002.

2. Review mutual aid agreements.

3. Designate suitable wind and flood resistant shelters in the community and make their locations known to the public.

4. Prepare for coordination of evacuation from potentially impacted areas including alternate transportation systems and locations of special needs facilities.

5. Activate warning/notification systems to inform public of protective measures to be taken including evacuation where appropriate.

6. Conduct evacuation of affected populations.

7. Open and staff shelters and reception centers.

8. Dispatch search and rescue teams.

9. Dispatch emergency medical teams.

10. Activate mutual aid activities.

11. Take measures to guard against further danger from downed trees and utility lines, debris, etc.

Evacuation Options
According to the Easthampton CEM plan, local officials have stated that White Brook Middle, Easthampton High, Williston-Northampton, Maple Street, and Pepin Schools as well as the Public Safety Building are all appropriate shelters for residents in the case of a hurricane. Local officials predict that up to 15,500 residents could potentially be affected by a hurricane.

Land Development Standards
There are no restrictions on development that are directly related to hurricanes. However, the City of Easthampton's Land Development Ordinance does have some provisions that are wind-related, specifically, zoning ordinances related to wireless communications facilities. In addition, the Ordinance sets restrictions to minimize flooding, which can also be an outcome of a hurricane or severe thunderstorm. (See Flooding section.)

Section VII: Special District Regulations

7.2 WIRELESS COMMUNICATIONS SERVICES DISTRICT
In addition to the general conditions and procedures established in Section 12.7 of this Ordinance for all special permits or Section 12.9 Site Plan Approval, the following additional requirements and procedures shall apply.

7.23 Description of Areas Included in the Wireless Communications Services District
7.231 The Wireless Communications Services District shall include the land within the boundaries delineated on a map at a scale of one inch to one thousand (1,000) feet

entitled "Wireless Communications Services District," City of Easthampton, on file in the office of the City Clerk.
7.232 The Wireless Communications Services District shall be construed as an overlay district with regard to said locations. All requirements of the underlying zoning district shall remain in full force and effect, except as may be specifically superseded herein.

7.24 Use Restrictions
(a) The telecommunication facilities allowed are free-standing monopoles, lattice steelwork structures, or antennae affixed to existing structures, with associated antenna and/or panels. Monopoles are preferred. Satellite dishes and/or antenna may be located on existing structures or may be free-standing. Monopoles shall not be located on buildings.
(b) Telecommunications towers may be constructed only after the issuance of a Special Permit from the Planning Board in accordance with this section and Section 12.7.
(c) Telecommunications towers are not permitted in the underlying Downtown Business District.
(d) Telecommunications antennas which are co-located on existing telecommunications towers or other existing structures may be constructed only after Site Plan Approval in accordance with this section and Section 12.9.
(f) In no event shall any telecommunications tower be located closer than one (1) mile to any other tower.
(g) Towers with one telecommunication provider shall be limited to 140 feet. Towers with co-located telecommunications facilities shall be allowed an additional 20 feet for each additional provider up to a maximum of one hundred ninety (190) feet.
(h) In a residential zoning district, a tower shall not be erected nearer to any property line than a distance equal to one hundred ten percent (110%) of the vertical height of the tower, measured at the mean finished grade of the facility base. The Planning Board may allow a shorter setback if the shorter setback provides adequate safety and esthetics, and the manufacturer or qualified licensed designer certifies that the tower is designed to collapse on itself in the event of failure.
(i) Setback from designated wetlands, water bodies and areas with a slope in excess of five (5) percent shall be at least one hundred and fifty (150) feet or 110% of the height of the tower, whichever is greater. Conservation Commission review and approval may be necessary.
(p) To the extent technologically feasible, all network interconnections from the telecommunications facility shall be via underground lines.
(r) Antennas or dishes located on a structure shall not exceed twenty-five (25) feet in height above the level of its attachment to the structure.

7.25 Submittal Requirements - Special Permit or Site Plan Approval
7.251 In accordance with this section, the location of a telecommunications facility will require either a Special Permit from the Planning Board or Site Plan Approval. An application for a Special Permit shall be filed in accordance with Section 12.7 and shall be accompanied by 10 copies of the following information. An application for

Site Plan Approval shall be filed in accordance with Section 12.9 and shall be accompanied by 10 copies of the following information.
a. Details of the tower (monopole, steelwork, guyed, freestanding, or other), guy wires and anchors, tower lighting
b. Location of all structures located within 300 feet of any tower or structure.
c. Location of alternate sites, if any….

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

Tornadoes/Microbursts

Worcester County and areas just to its west, including portions of Hampshire County, have been dubbed the "tornado alley" of the state because the majority of significant tornadoes in Massachusetts's weather history have occurred in that region.[11] 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.[12] Like earthquakes, the location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail.

Management Plans

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

1. Develop and disseminate emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures, and locations of public shelters.

2. Strict adherence should be paid to building code regulations for all new construction.

3. Maintain plans for managing tornado response activities. Refer to the non-institutionalized, special needs and transportation resources listed in the Resource Manual.

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

[11] Comprehensive Emergency Management Plan for the City of Easthampton, August 1999.
[12] *www.ibhs.org.*

1. Designate appropriate shelter space in the community that could potentially withstand tornado impact.

2. Periodically test and exercise tornado response plans.

3. Put Emergency Management on standby at tornado 'watch' stage.

4. At tornado 'warning' stage, broadcast public warning/notification safety instructions and status reports.

5. Conduct evacuation, reception, and sheltering services to victims.

6. Dispatch search and rescue teams.

7. Dispatch emergency medical teams.

8. Activate mutual aid agreements.

9. Take measures to guard against further injury from such dangers as ruptured gas lines, downed trees and utility lines, debris, etc.

10. Acquire needed emergency food, water, fuel, and medical supplies.

11. Take measures relating to the identification and disposition of remains of the deceased.

Evacuation Plans

There is no shelter for tornado victims specifically identified in the Easthampton CEM Plan.

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

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Wireless Communication Services District	Restrictions on height, and other features of wireless communication towers	Overlay district area	Somewhat effective for preventing damage to nearby property	**None.**
State Building Code	The City of Easthampton has adopted the Massachusetts State Building Code.	Entire city.	Effective.	**None.**
Debris Management Plan	A debris management plan could be developed.[13]	Entire city.	Effective.	**Consider participation in the creation of a Regional Debris Management Plan.**

[26] 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. Additional information is available at *http://www.fema.gov/rrr/pa/dmgbroch.shtm.*

Wildfires/Brushfires

Hampshire County has approximately 252,000 acres of forested land, which accounts for 71 percent of total land area. Forest fires are therefore a potentially significant issue. In Easthampton, approximately 43 percent of the city's total land area is in forest, or about 3,690 acres, and is therefore at risk of fire. Between 2001 and 2006, there have been 253 brushfires in the city.

Management Plans

The Easthampton CEM Plan does not include any specific information on wildfires.

Land Development Standards

There are currently no restrictions on development that are based on the need to mitigate the hazards of wildfires/brushfires. However, the Definitive Plan of a subdivision is reviewed by the Fire Chief to ensure that the subdivision has sufficient fire protection standards. In addition, any use in which hazardous materials are stored must seek Fire Chief approval.

Regulatory Measures

Burn Permits*:* Burn permits for the City of Easthampton are issued by the Fire Department. Approximately 800-900 permits were issued in 2006**.** Easthampton residents that wish to participate in open burning must go to the Easthampton Public Safety Complex to fill out a burning permit. There is no fee for this permit. Residents need only to fill out one burning permit for the season. Once permits are on file, residents need to call the day they wish to burn. Open burning may or may not be allowed depending on weather conditions.

Public Education/Outreach: The Easthampton Fire Department has two primary outreach and education measures for fire prevention. First, the Fire Department holds an Open House. Second, three S.A.F.E. (Student Awareness of Fire Education) instructors teach fire safety in all public and private elementary schools throughout the year. Several members participate in educational presentations and demonstrations to the public throughout the year, including portable fire extinguisher instruction and CPR.

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

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Burn Permits	Residents are permitted to obtain burn permits over the phone. State police personnel provide information on safe burn practices.	Entire city.	Effective.	**None.**
Subdivision Review Fire Safety	The Fire Chief is involved in the review of subdivision plans.	Entire city.	Effective.	**None.**
Public Education/ Outreach	The Fire Department has an ongoing educational program in the schools.	Entire city.	Effective.	**None.**

Earthquakes

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

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

Management Plans

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

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

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

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

7. Emergency warning/notification information and instructions will be broadcast to the public.
8. Search and rescue teams will be dispatched.
9. Emergency medical teams will be dispatched.
10. Firefighters will address fires/explosions, and HAZMAT incidents.
11. Law enforcement personnel will coordinate evacuation and traffic control.
12. Reception centers and shelters will be opened and staffed.
13. Animal control measures will be taken.
14. Law enforcement personnel will protect critical facilities and conduct surveillance against criminal activities.
15. Immediate life-threatening hazards will be addressed such as broken gas lines, downed utility wires, and fire control resources.
16. Emergency food, water, and fuel will be acquired.
17. Activate mutual aid.
18. Measures will be taken relating to identification and disposition of remains of deceased by the Chief Medical Examiner.

Evacuation Options

The maximum peak population affected by an earthquake is estimated at 18,786 people, 604 would be without transportation, and 190 would need special assistance. The CEM Plan specifies that up to 2 buses, 3 vans, and 2 ambulances may need to be used in addition to private vehicles. According to the Easthampton CEM Plan, earthquake victims can seek shelter at all shelters identified.

State Building Code

State and local building inspectors are guided by regulations put forth in the Massachusetts State Building Code. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975 and included specific earthquake resistant design standards. These seismic requirements for new construction have been revised and updated over the years and are part of the current, 6th Edition of the Massachusetts State Building Code. Given that most structures in Massachusetts were built before 1975, many buildings and structures do not have specific earthquake resistant design features. According to the 2000 U.S. Census, 65% of the housing in Easthampton was built before 1970. In addition, built areas underlain by artificial fill, sandy or clay soils are particularly vulnerable to damage during an earthquake.

Restrictions on Development

There are no seismic-related restrictions on development.

Table 5-5: Existing Earthquake Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
State Building Code	The City of Easthampton has adopted the State Building Code.	Entire city but applies to new construction only.	Effective for new buildings only.	**Evaluate older structures to be used as shelters to determine if they are earthquake resistant.**
Debris Management Plan	A debris management plan could be developed.	Entire city.	Effective.	**Consider participation in the creation of a Regional Debris Management Plan.**
Shelters	Shelters have been identified for victims of earthquakes in Easthampton.	Entire city.	Effective.	**None.**

Dam Failures

The only mitigation measures in place for dams are the state regulations that control their construction and inspection.

Management Plans and Regulatory Measures

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

Type 1: Slowly Developing Condition

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

Type 2: Rapidly Developing Condition

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

Type 3: Practically Instantaneous Failure

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

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

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

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

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

7. Dispatch search and rescue teams.
8. Coordinate evacuation and sheltering of affected populations.
9. Activate mutual aid if needed.
10. Acquire additional needed supplies not already in place, such as earth moving machinery.
11. Establish incident command post as close to affected area as safely possible.
12. Provide security for evacuated public and private property.

Evacuation Options

The Easthampton CEM Plan identifies the three "significant" hazard dams (Manhan River, Nashawannuck Pond, Lowe Mill Pond) and their associated inundation zones and evacuation routes.

Depending on the dam that failed, there could be an estimated peak population of up to 150 people downstream, and several special needs facilities. The Easthampton CEM Plan does not note any potential for dam hazards emanating from dams upstream of the city.

Permits Required for New Dam Construction

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

Dam Inspections

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

Restrictions on Development

There is no mention made regarding the construction of new dams in the City of Easthampton zoning or subdivision regulations, although a Special Permit is required from the Zoning Board of Appeals to fill any swale or valley (see language in Flooding section).

There are no city restrictions on dam locations. The DCR issues permits for new dams and does have the authority to deny a permit if it is determined that the design and/or location of the dam is not acceptable.

Table 5-6: Existing Dam Failure Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
New Dam Construction Permits	State law requires a permit for the construction of any dam.	Entire city.	Effective. Ensures dams are adequately designed.	**None.**
Dam Inspections	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Entire city.	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.**
Evacuation Plans	Comprehensive evacuation plans would ensure the safety of the citizens in the event of dam failure.	Inundation areas in city.	None.	**None.**

Drought

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

Management Plans

There is nothing in the Easthampton CEM Plan related to drought.

Land Development Regulations

Easthampton's Land Development Ordinance has several sections governing with flood and stormwater management, proper drainage, and groundwater protection. The by-laws protecting these features of the landscape can also be seen as preventing drought, as they promote the natural processes of infiltration and groundwater recharge. (See language in Flood section, above.)

Easthampton Community Development Plan

Water is a main focus of the Open Space Element of the Easthampton Community Development Plan, and it makes several recommendations to protect and manage Easthampton's water quality and sources, including a section dedicated to the adequacy of water supply protection.

Section 8: Goals and Objectives

Goal 2: Protect surface and ground water quality.

Objectives:

A. Extend river protection boundary to 300 feet from the Manhan

B. Identify and restore riparian areas lacking vegetation

C. Continue acquisition efforts along the Manhan River, Bassett Brook, and Hannum Brook

D. Continue restoration work at Nashawannuck Pond

E. Investigate funding sources for assessment and potential clean up of Lower Mill Pond

F. Adopt Stormwater Ordinances and Low Impact Development Standards in Subdivision Regulations

G. Write a local Wellhead Protection Plan

Adequacy of Water Supply Protection

The Barnes Aquifer in Easthampton is a sole source aquifer supplying drinking water to Easthampton through five active wells. In 2003, the Department of Environmental Protection conducted a Source Water Assessment and Protection Report (SWAP). The findings and recommendations from this report are included here. Easthampton has

implemented an Aquifer Protection overlay district which covers a portion of the Zone II and limits the type of uses and materials allowed in the zone. There are, however, preexisting uses that are grandfathered and therefore exempt from the ordinance. In conjunction with the neighboring communities that also contain portions of the aquifer and the Pioneer Valley Planning Commission, the Barnes Aquifer Protection Advisory Committee (BAPAC) conducts outreach, education, and review of proposed developments in the recharge area.

Current Protection Efforts

- Aquifer Protection Overlay District
- BAPAC outreach and education efforts
- Sleeved sewer lines
- Sleeved storm drains
- Inventory and support of UST removal
- Proactive and knowledgeable about activities in Zone II
- Recent upgrades to wastewater treatment plant

Threats to Aquifer

- Loss of pervious surface that limits recharge capability
- Existing and future uses that utilize, manufacture, or store hazardous chemicals
- Grandfathered activities and land privately owned in Zone I
- Land use activities in neighboring cities and towns
- Residential stormwater and septic system failure
- Fertilizer and pesticide residue from agricultural activities

Source Protection Recommendations

- Write a local Wellhead Protection Plan
- Pursue acquiring lands in the Zone I not under the control of the City
- Continue monitoring activities in the Zone I
- Continue to work with BAPAC on education efforts and reviewing developments
- Work with emergency response teams to notify them of stormwater drainage pathways
- Continue partnership with local businesses on hazardous material handling
- Monitor progress on ongoing remediation efforts
- Coordinate UST removal with surrounding communities
- Work with farmers on water protection BMPs

- Work with the City Planning Department on prioritizing parcels in the Zone II
- Continue working with Board of Health on inspections
- Continue encouraging other communities to protect the aquifer

Additional Water Supply Protection Strategies

- Commission a detailed hydrological study of the area around the Maloney Wellfield: this study would help the city to determine if additional protections are necessary for this part of the aquifer
- Adopt Transfer of Development Rights program: this type of program can steer development away from environmentally sensitive areas to more appropriate areas
- Modify the Open Space Residential Development method to be allowed by-right: this would encourage this type of development which incorporates more open and permeable land
- Adopt a Stormwater Ordinance and low impact development techniques in the Subdivision Regulations: these techniques will limit the amount of potentially contaminated stormwater runoff

Wastewater Service and Stormwater

Due to the NPDES Phase II requirements, Easthampton will need to adopt Stormwater Ordinances. In addition, the City must actively work towards implementing their stormwater management plan and submit annual status reports to the EPA. Many runoff and drainage issues from new developments can be solved during the site plan process. Existing uses also pose threats from contaminated stormwater runoff. Pesticides, nutrients from waste and from fertilizers, sediment, and heavy metals can all contaminate stormwater runoff. This runoff eventually finds its ways into the surface and ground water of Easthampton. By adopting BMPs, much of this runoff can be curtailed. One example of confronting the issue of stormwater is the project at Nashawannuck Pond. Three stormwater separators have been installed to separate the contaminated sediments from the water. This will improve the pond's water quality by cleaning the stormwater before it reaches the pond.

Easthampton has no combined sewer overflows (CSOs) which are a major threat to surface waters such as the Connecticut River. The municipal wastewater treatment plant was recently upgraded.

Other Mitigation Measures

None.

Table 5-7: Existing Drought Hazard Mitigation Measures

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Aquifer Protection District Overlay	Areas delineated as primary recharge areas for groundwater aquifers, and watershed areas for reservoirs are protected by strict use regulations.	Groundwater recharge areas and reservoir watersheds	Very effective for preventing groundwater contamination and for controlling stormwater runoff, promoting groundwater recharge.	**None.**
Easthampton Community Development Plan	Makes recommendations for protecting Easthampton's water supply and quality.	Entire city.	Somewhat effective for raising awareness about protecting water quality, but not water conservation.	**Work to implement goals in Community Development Plan.**
Easthampton Water Use Restriction Ordinance	Allows the city to declare a State of Water Conservation and enforce restrictions, conditions, and requirements limiting the use of water by residents and businesses	Entire city	Very Effective for enforcing water conservation measures during a drought.	**None.**

Man-Made Hazards/Hazardous Materials

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

Management Plans

The Easthampton CEM Plan has an appendix dedicated to Hazardous Materials (HAZMATS), identifying procedures for dealing with an hazardous materials incident.

Land Development Regulations

Easthampton's Land Development Ordinance addresses hazard materials management in the Zoning Ordinance via the two water protection overlay districts. In both the Aquifer Protection District and the Floodplain and Manhan River Protection District, hazardous materials are prohibited, or need special permit, respectively. In addition, there are some detailed environmental performance standards regarding hazardous wastes.

Section VII: Special District Regulations

7.0 AQUIFER PROTECTION DISTRICT

7.01 Purpose of the District

To promote the health, safety, and general welfare of the community and to protect and preserve the groundwater resources of the city from adverse development and land use practices that might reduce the quality or quantity of water that is now, and in the future will be, available for use by municipalities, individuals and industries.

7.02 Scope of Authority

The Aquifer Protection District is an overlay district and shall be super-imposed on the other zoning districts. All provisions of the zoning ordinance of the City of Easthampton applying to the district so overlaid shall remain valid and in full force and effect.

7.03 Establishment and Delineation of Aquifer Protection District

a. For the purposes of this district, there is hereby established within the city, an aquifer recharge area, which has been defined by standard geologic and hydrologic investigations. This district consists of lands lying within the primary and secondary aquifer recharge of groundwater aquifers or within one-half mile radius of wells which now, or may in the future, provide public water supply within the boundaries of the City of Easthampton.

b. The boundaries of this district are delineated on a map at a scale of one inch to eight hundred (800) feet entitled, "Aquifer Protection District," City of Easthampton, on file in the office of the City Clerk.

c. Where the bounds as delineated are in doubt or in dispute, the burden of proof shall be upon the owner(s) of the land in question to show where they should be properly located.

At the request of the owner(s), the city may engage a professional geologist, hydrogeologist, soil scientist or engineer trained and experienced in hydrogeology, to determine more accurately the location and extent of an aquifer or recharge area, and may charge the owner(s) for all or part of the investigation.

7.05 Use Regulations

Within the Aquifer Protection District, the following use regulations shall apply:

7.051 Permitted Uses

The following uses are permitted within the Aquifer Protection District, provided that all necessary permits, orders, or approvals required by local, state, or federal law are also obtained:

1. Conservation of soil, water, plants and wildlife.

2. Outdoor recreation, nature study, boating and fishing.

3. Foot, bicycle and/or horse paths, and bridges.

4. Single family residential development, as permitted in the underlying district provided that areas in the Aquifer Protection District, not served by the municipal sewerage system, meet the septic system provisions of Section 7.052-n and o, and all other applicable provisions herein.

5. Agriculture, horticulture, or floriculture provided that the storage of agricultural chemicals, in quantities greater than normal household use, including but not limited to: fertilizers, herbicides, pesticides, manure or other leachable materials are in compliance with the requirements found in 310 CMR 22.21:(2) (b) 3 and 4.

6. Forestry and nursery uses.

7. Day care centers, family day care homes and school age child care programs as defined in M.G.L. Chapter 40a.

8. Structures for educational or religious purposes.

7.052 Prohibited Uses

a. Business and industrial uses, not agricultural, which generate, treat, store, or dispose of hazardous wastes…;

b. Business or industrial uses, not agricultural, which dispose of process wastewaters on-site;

c. Solid waste landfills, dumps, auto recycling, auto graveyards, junk and salvage yards, landfilling or storage of sludge and septage…;

d. Trucking repair centers, bus terminals, car washes, motor vehicle gasoline sales, motor vehicle and boat service and repair shops, commercial fuel oil storage and sales;

e. Storage of and/or transmission of liquid petroleum products is prohibited...;

f. Outdoor or underground storage of hazardous chemicals, pesticides, herbicides or hazardous wastes, or indoor storage of such materials in corrodible containers.

g. Dumping or disposal of any hazardous material or hazardous waste on the ground, in water bodies, in septic systems or in other drainage system.

h. Stockpiling and disposal of snow or ice removed from highways and streets located outside of the Aquifer Protection District that contains sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for snow and ice removal;

i. Wastewater treatment works…;

j. Residential, commercial or industrial uses within Zone I of any municipal water supply well.

k. Duplexes or multifamily residential uses, except in an Open Space Residential Development served by the municipal sewer system.

l. Outdoor storage of salt or deicing chemicals.

m. Rendering impervious by any means, more than fifteen (15) percent or 2,500 square feet of the area of any single lot, whichever is greater, unless a system for artificial recharge that will not result in the degradation of groundwater is provided.

n. Septic system components within 150 feet of Broad Brook.

o. Individual sewage disposal systems that are designed to receive more than 110 gallons of sewage per quarter acre under one ownership per day, or 440 gallons of sewage on any one acre under one ownership per day, whichever is greater…;

p. Excavation of or removal of earth, sand, gravel, clay and other soils shall not be permitted.

7.053 Uses by Special Permit

The following uses may be allowed by Special Permit from the Planning Board…

(several uses listed).

7.054 Aquifer Protection Performance Standards

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

a. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the public highway safety requirements, and its use shall be eliminated on roads which may be closed to the public in winter. Alternative deicing materials, such as calcium chloride, shall be used to the extent feasible for winter road maintenance.

b. The storage of sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads shall be covered and located in a paved surface with berms, or within a structure designed to prevent the generation and escape of contaminated run-off.

c. Fertilizers, pesticides, herbicides, lawn care chemicals or other leachable materials shall be used in accordance with Lawn Care Regulations of the Massachusetts Pesticide Board, 333 CMR 10.03 (30, 31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater.

d. The storage of commercial fertilizers and soil conditioners shall be within structures designed to prevent the generation and escape of contaminated run-off or leachate.

e. All new animal manure storage areas shall be covered and/or contained in accordance with the Natural Resource Conservation Service standards to prevent the generation and escape of contaminated run-off or leachate (Amended 6-3-97).

f. All hazardous materials, as defined in M.G.L. Chapter 21E, must be stored either in a free standing container within a building, or in a free-standing container above ground level with protection to contain a spill the size of the container's total storage capacity.

g. In accordance with the State Plumbing Code, all vehicle maintenance facilities must have floor drains, unless they receive a variance from the State Plumbing Board, which must be connected to a municipal sewer system or to a state-approved holding tanks in unsewered areas. All other facilities which use, store or maintain hazardous materials or wastes must, with state approval, seal floor drains or connect them to a sewer system or holding tank.

h. With the exception of bridges, the area within 75 feet of Broad Brook shall be kept in a natural vegetated condition and not altered in any way.

i. The following standards for urban stormwater run-off control apply:

(1) For commercial and industrial uses, to the extent feasible, run-off from impervious surface shall be recharged on the site by stormwater infiltration basins or similar systems covered with natural vegetation. Such run-off shall not be discharged directly to rivers, streams, or other surface water bodies. Dry wells shall be used only where other methods are infeasible. All such basins and wells shall be preceded by oil, grease and sediment traps to facilitate removal of contamination. All recharge areas shall be permanently maintained in full working order by the owner(s). Infiltration systems greater than three-feet deep shall be located at least one hundred feet from drinking water wells, and shall be situated at least ten-feet down-gradient and one hundred-feet up-gradient from building foundations to avoid seepage problems. Infiltration basins and trenches shall be constructed with a three-foot minimum separation between the bottom of the structure and maximum groundwater elevation.

(2) For commercial or industrial projects which will render impervious, by any means:

(a) more than ten (10) percent or up to twenty (20) percent of any single lot, or;

(b) more than five (5) percent or up to ten (10) percent of lots of thirty-five thousand (35,000) square feet or more; a system of artificial aquifer recharge of precipitation must be developed to retain stormwater runoff within the confines of the lot. The management of stormwater and any artificial recharge systems developed shall be designed so as not to result in the degradation of groundwater. A stormwater management plan shall be developed which provides for the artificial recharge of precipitation to groundwater, where feasible. Recharge shall be attained through site design that incorporates natural drainage patterns and vegetation, and through the use of stormwater infiltration basins, infiltration trenches, porous pavement or similar systems. All infiltration practices shall be preceded by oil, grease, and sediment traps or other best management practices to facilitate removal of contamination.

(3) For residential uses, to the extent feasible, recharge shall be attained through site design that incorporates natural drainage patterns and vegetation. To the extent possible, stormwater run-off from rooftops, driveways, roadways and other impervious surfaces shall be routed through areas of natural vegetation and/or devices such as infiltration basins, infiltration trenches or similar systems.

(4) Infiltration practices shall be utilized to reduce run-off volume increases to the extent possible as determined in accordance with infiltration standards and specifications established by the Soil Conservation Service. A combination of successive practices may be used to achieve the desired control requirements. Justification shall be provided by the person developing land for rejecting each practice based on site conditions. Any and all recharge areas shall be permanently maintained in full working order by the owner. Provisions for maintenance shall be described in the stormwater management plan.

j. The application of pesticides, herbicides or fertilizers for non-domestic or non-agricultural uses must be approved by the Board of Health.

7.06 Procedures for Issuance of a Special Permit

7.061 Requirements for Special Permit in the Aquifer Protection Districts

The applicant shall file six (6) copies of a site plan prepared by a qualified professional with the Planning Board. The site plan shall at a minimum include the following information where pertinent.

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

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

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

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

(3) Evidence of compliance with the Regulations of the Massachusetts Hazardous Waste Management Act 310 CMR 30, including obtaining an EPA identification number from the Mass. Department of Environmental Protection.

c. Drainage recharge features and provisions to prevent loss of recharge.

d. Provisions to control soil erosion and sedimentation, soil compaction, and to prevent seepage from sewer pipes.

e. Periodic water quality monitoring may be required by the Planning Board including sampling of wastewater disposed to on-site systems and sampling from groundwater monitoring wells to be located and constructed as specified in the Special Permit with reports to be submitted to the Planning Board, the Board of Health and the City Engineer.

The costs of monitoring, including sampling and analysis, shall be borne by the owner of the premises.

7.062 Additional Procedures for Special Permit in the Aquifer Protection District:

a. The Planning Board shall follow all Special Permit procedures contained in Section 12.7 of this ordinance. In addition the Planning Board shall distribute copies of all application materials to the Board of Health, the Conservation Commission, and the City Engineer, each of which shall review the application, and following a vote, shall submit recommendations and comments to the Planning Board. Failure of boards to make recommendations within 35 days of distribution of the applications shall be deemed to be lack of opposition. One copy of the application materials shall be transmitted to or retained by the City Clerk for viewing by the public during office hours.

b. The Planning Board may grant the required Special Permit only upon finding that the proposed use meets the following standards and those specified in Section 12.79 of this ordinance. The Planning Board must find that the proposed use:

(1) Is in harmony with the purpose and intent of this ordinance and will promote the purposes of the aquifer protection district.

(2) Is appropriate to the natural topography, soils and other characteristics of the site to be developed.

(3) Has adequate public sewerage and water facilities, or the suitable soil for on-lot sewerage, in compliance with applicable Mass. Department of Environmental Protection standards in 310 CMR 22, and for an on-lot water system.

(4) Will not, during construction or site work or thereafter, have an adverse environmental impact on any watershed or watercourse in the district. A commercial forestry operation shall present a plan for cutting which provides safe temporary equipment storage, and follows the Massachusetts Forest Cutting Practices Act 304 CMR 11.00.

(5) Will not adversely affect the existing or potential quality and quantity of water in the aquifer protection district.

(6) Has, where required, provided the mechanism to assure on-site quality recharge. Appearance shall be given by a professional engineer.

(7) Will not promote the intensive use of pesticides. Golf courses must present an application schedule and list of pesticides to be used which will not contaminate the aquifer.

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

Section X: Additional Land Use Regulations

10.2 ENVIRONMENTAL PERFORMANCE STANDARDS

10.25 Hazardous Activities

a. No activities that emit dangerous radioactivity, at any point; no electrical disturbance adversely affecting the operation at any point, of any equipment, other than that of the creator of such disturbance, shall be permitted.

b. All activities that involve hazardous materials at any point shall be provided with adequate safety devices against fire and explosion and adequate fire-fighting and fire-suppression devices and equipment.

10.26 Hazardous Materials Storage

a. All outdoor storage facilities for fuel, chemicals, chemical or industrial wastes, and potentially harmful raw materials, shall be located on impervious pavement, and shall be completely enclosed by an impervious dike which shall be high enough to contain a volume of liquid kept within the storage area, at least equal to one hundred ten (I 10) percent of the capacity of the container(s), so that such liquid shall not be able to spill onto or seep into the ground surrounding the paved storage area. Storage tanks for "home heating oil" and diesel fuel, not exceeding two hundred seventy-five (275) gallons in size, may be exempted from this requirement.

b. All storage of hazardous materials, at any point shall be provided with adequate safety devices against fire and explosion and adequate fire-fighting and fire-suppression devices and equipment.

Other Mitigation Measures

None.

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

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Aquifer Protection District	Areas delineated as primary recharge areas for groundwater aquifers, and watershed areas for reservoirs are protected by strict use regulations.	Groundwater recharge areas and reservoir watersheds	Very effective for preventing groundwater contamination	**None.**
Floodplain and Manhan River Protection District	Areas delineated as within the 100-year floodway, or 100 feet from the Manhan River are protected by strict use regulations	Floodplains, land within 100 feet of Manhan River	Somewhat effective for preventing surface water contamination and groundwater contamination	**None.**
Environmental Performance Standards	Storage and use of hazardous materials must adherence to strict safety regulations	Entire city.	Very effective for preventing a hazardous materials accident	**None.**

6 – FUTURE MITIGATION STRATEGIES

Goal Statements and Action Items

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

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

General Mitigation Action Items

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

Action Item: Identify existing shelters that are earthquake resistant as well as outside of floodplain and inundation areas. Disseminate this information to appropriate city departments.
Responsible Department/Board: Emergency Management Director
Proposed Completion Date: 2008
Rationale: Ensure shelters are not damaged just at times when they are needed to protect the public.

Action Item: Inventory supplies at existing shelters and develop a needs list and storage requirements. Establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplies in the event of a natural disaster.
Responsible Department/Board: Emergency Management Director, Board of Health
Proposed Completion Date: 2009
Rationale: Increase ability to support public in shelters during a disaster.

Action Item: Examine current notification system including feasibility of Reverse 911.[14] Develop a preliminary project proposal and cost estimate.
Responsible Department/Board: Mayor, City Council
Proposed Completion Date: 2008
Rationale: Increase ability of Town to inform and keep in touch with all town residents in the event of a disaster.

Action Item: Collect, periodically update, and disseminate information on which local radio stations provide emergency information, what to include in a 'home survival kit,' how to prepare homes and other structures to withstand flooding and high winds, and the proper evacuation procedures to follow during a natural disaster.
Responsible Department/Board: Emergency Management Director
Proposed Completion Date: 2010
Rationale: Increase likelihood of town residents being prepared in the event of a disaster.

Flooding

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

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

Action Item: Amend the Aquifer Protection District Overlay and add Zone II to the northern portion of the city.
Responsible Department/Board: Barnes Aquifer Protection Advisory Committee, Planning Board
Proposed Completion Date: 2008
Rationale: Will limit development in an area vulnerable to flooding

[14] In essence, Reverse 911 is a Windows compatible software program, which uses GIS and database technology to create call lists of phone numbers within a specified geographical area and provide prerecorded messages to the residents at those numbers. Call lists can be created ahead of time or as emergency or other situations arise. The system is voluntary and it is a simple matter to remove those residents who do not wish to participate. Cost of the system varies depending on a number of factors. The Town of Green Tree, Pennsylvania was able to subsidize their purchase of a Reverse 911 system through a $10,000 Community Development Block Grant.

Action Item: Develop and adopt Stormwater and Erosion Control bylaw with Low Impact Development standards
Responsible Department/Board: Planning Board, DPW, Board of Health
Proposed Completion Date: 2008
Rationale: Will decrease erosion during floods, therefore less debris that could damage property or injure people will be carried by the flood waters and foundations of buildings near the stream banks are less likely to be destabilized.

Action Item: Add infiltration requirements, including impervious surface limits, to the Construction Standards in the Subdivision Regulations.
Responsible Department/Board: Planning Board
Proposed Completion Date: 2009
Rationale: Will decrease likelihood of future development exacerbating any existing flooding hazards.

Action Item: Prioritize and acquire undeveloped properties within flood zones throughout the city.
Responsible Department/Board: Planning Department, Conservation Commission, City Council
Proposed Completion Date: Ongoing
Rationale: Will decrease likelihood of future development exacerbating any existing flooding hazards.

Action Item: Develop and implement a plan for maintenance of detention basins.
Responsible Department/Board: Department of Public Work, Planning Department
Proposed Completion Date: 2009
Rationale: Will maximize storm water storage capacity.

Severe Snow Storms/Ice Storms

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

Action Item: Develop and implement a plan for providing access to water, information, shelter, and food stores for special needs populations in the city in the event of a severe winter storm.
Responsible Department/Board: EMD, Board of Health
Proposed Completion Date: 2009
Rationale: Minimize loss of life during severe winter storms

Action Item: Evaluate the EOCs to determine if they are capable of supporting potential snow loads and make necessary upgrades if they are found to be deficient.
Responsible Department/Board: Building Inspector, Emergency Management Director
Proposed Completion Date: 2011
Rationale: EOCs will be better able to withstand disasters.

Hurricanes and Tornadoes

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

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

Action Item: Evaluate all EOCs to determine if they are resistant to potential winds effects from hurricanes, tornadoes and microbursts and make necessary upgrades if they are found to be deficient.
Responsible Department/Board: Building Inspector, Emergency Management Director
Proposed Completion Date: 2011
Rationale: EOCs will be better able to withstand disasters.

Action Item: In the Zoning regulations for Telecommunication Facilities, add safety and prevention of wind-related damage as a stated purpose.
Responsible Department/Board: Planning Board
Proposed Completion Date: 2008
Rationale: Will result in future telecommunications facilities being better able to withstand extreme storm conditions, lowering communications breakdowns among public safety officials during storms and decreasing creation of debris that could damage structures or injure people.

Wildfires/Brushfires

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

Action Items: Develop and distribute an educational pamphlet on fire safety and prevention.
Responsible Department/Board: Fire Department
Proposed Completion Date: Ongoing
Rationale: Will decrease likelihood of allowed, open burning spreading and becoming a wildfire.

Earthquakes

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

Action Item: Evaluate all EOCs and structures to be used as shelters to determine if they are earthquake resistant and make necessary upgrades if they are found to be deficient.
Responsible Department/Board: Building Inspector, Emergency Management Director
Proposed Completion Date: 2008
Rationale: EOCs will be better able to withstand disasters.

Action Item: Install back-up generators to ensure that all identified shelters have sufficient back-up utility service in the event of primary power failure, pending availability of funding.
Responsible Department/Board: Building Inspector, Emergency Management Director
Proposed Completion Date: 2010
Rationale: Shelters will be better able to withstand disasters and provide adequate shelter for city residents during a disaster.

Dam Failure

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

Action Item: Create schedule of required dam inspections, send letters of notification to private dam owners at both one year and six months prior to required inspection dates, determine if inspections have been completed, require

copies of inspection reports be provided to the city, and initiate appropriate legal actions if inspections are not completed as required.
Responsible Department/Board: Department of Public Works
Proposed Completion Date: Ongoing
Rationale: Ensure dam owners realize their responsibility to inspect dams on their property to lessen the likelihood of dam failures.

Action Item: Incorporate dam safety into development review process.
Responsible Department/Board: Planning Board
Proposed Completion Date: 2008
Rationale: Will decrease likelihood of future development in dam failure inundation areas.

Action Item: Identify and remove unnecessary dams.
Responsible Department/Board: Mayor
Proposed Completion Date: 2010
Rationale: Will lessen the likelihood of dam failures.

Drought

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

Action Item: Implement goals in the Community Development Plan on protection of water supply and quality.
Responsible Department/Board: DPW, Barnes Aquifer Protection Advisory Committee, Mayor
Proposed Completion Date: Ongoing
Rationale: Will decrease likelihood of disruption of water supply during drought.

Man-Made Hazards/Hazardous Materials

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to man-made hazards/hazardous materials.

Action Item: Establish and implement an Action Plan for rotation of inspection and address chlorine releases at EPA Tier II locations.
Responsible Department/Board: Fire Department
Proposed Completion Date: 2009
Rationale: Decrease chance of accidental release of hazardous materials.

Prioritized Implementation Schedule

Summary of Critical Evaluation
The Easthmapton Hazard Mitigation Planning Committee reviewed each of the actions identified above, as well as existing mitigation strategies using the following factors to prioritize mitigation projects:

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

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

PRIORITIZED IMPLEMENTATION SCHEDULE
(ACTION PLAN)
IMPLEMENTATION STRATEGY FOR PRIORITY MITIGATION ACTIONS

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

ACTION NUMBER	MITIGATION ACTION	RESPONSIBLE DEPARTMENT/BOARD	PROPOSED COMPLETION DATE	HAZARD ACTION INTENDED TO MITIGATE	POTENTIAL FUNDING SOURCE(S)	ESTIMATED COST
1	Prioritize and acquire undeveloped properties within the flood zones throughout city	Planning Department, Conservation Commission, City Council	Ongoing	Flooding, Hurricanes	City Staff / Volunteers	N/A
2	Develop and distribute an educational pamphlet on fire safety and prevention.	Fire Department	Ongoing	Wildfires/Brushfires	City Staff / Volunteers	N/A
3	Implement the goals in the Community Development Plan on protection of water supply and quality.	DPW, Barnes Aquifer Protection Advisory Committee, Mayor	Ongoing	Drought	City Staff / Volunteers	N/A
4	Create schedule of required dam inspections, send letters of notification to private dam owners at both one year and six months prior to required inspection dates, determine if inspections have been completed, require copies of inspection reports be provided to the city, and initiate appropriate legal actions if inspections are not completed as required.	DPW	Ongoing	Dam Failure	City Staff	N/A
5	Examine current notification system including feasibility of Reverse 911.	Mayor, City Council	2008	All, except Drought	City Staff	N/A

Action Number	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Hazard action intended to mitigate	Potential Funding Source(s)	Estimated Cost
6	Identify existing shelters that are earthquake resistant as well as outside of floodplain and inundation areas. Disseminate this information to appropriate city departments.	EMD, Board of Health	2008	Earthquake, Flood, Dam Failure	City Staff	N/A
7	Evaluate all EOCs and structures to be used as shelters to determine if they are earthquake resistant, wind effects of hurricanes, tornadoes, microbursts and capable of supporting snow loads and make necessary upgrades if they are found to be deficient.	Building Inspector, EMD	2008	Earthquake, Severe Snow/Ice Storms, Hurricanes, Flood, Tornadoes, Hazardous Materials/Man-Made Hazards	City Staff	N/A
8	Develop and adopt a Stormwater and Erosion Control Bylaw with Low Impact Development Standards	Planning Board, DPW, Board of Health	2008	Flood, Dam Failure	Smart Growth Technical Assistance Grant	$7,000
9	Amend the Aquifer Protection District Overlay and add Zone II to the northern portion of city	Barnes Aquifer Protection Advisory Committee, Planning Board	2008	Flood, Drought	Smart Growth Technical Assistance Grant	$5,000
10	Incorporate dam safety into development review process	Planning Board	2008	Dam Failure	City Staff	N/A

Action Number	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Hazard action intended to mitigate	Potential Funding Source(s)	Estimated Cost
11	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.	EMD, Board of Health	2009	All, except Drought	Homeland Security grants, Massachusetts Executive Office of Public Safety	To be determined
12	Develop and implement a plan for providing access to water, information, shelter, and food stores for special needs populations in city in the event of severe winter storm.	EMD, Board of Health	2009	Severe Snow/Ice Storms	Homeland Security grants, Massachusetts Executive Office of Public Safety	To be determined
13	Establish and implement an action plan for rotation of inspection at EPA Tier II facilities.	Fire Department	2009	Hazardous Materials/Man-Made Hazards	City Staff	N/A
14	Develop and implement a plan for maintenance of detention basins	Department of Public Works, Planning Department	2009	Flood, Dam Failure, Hurricane	City Staff	N/A
15	Add infiltration requirements, including impervious surface limits, to the Construction Standards in the subdivision regulations	Planning Board	2009	Flood, Dam Failure, Hurricane	Planning Board	N/A

ACTION NUMBER	MITIGATION ACTION	RESPONSIBLE DEPARTMENT/BOARD	PROPOSED COMPLETION DATE	HAZARD ACTION INTENDED TO MITIGATE	POTENTIAL FUNDING SOURCE(S)	ESTIMATED COST
16	Install back-up generators to ensure that all identified shelters have sufficient back-up utility service in the event of primary power failure, pending availability of funding.	Building Inspector, EMD	2010	All, except Drought	Commercial Equipment Direct Assistance Program (CEDAP)	To be determined
17	Collect, periodically update and disseminate information on which local radio stations provide emergency information.	EMD	2010	All, except Drought	City Staff	N/A
18	Remove unnecessary dams.	Mayor, Department of Public Works	2011	Dam Failure	City Staff	N/A
19	In the Zoning regulations for Telecommunication Facilities, add safety and prevention of wind-related damage as a stated purpose.	Planning Board	2008	Hurricanes, Tornadoes/ Microbursts	City Staff	N/A

7 – PLAN ADOPTION & IMPLEMENTATION

Plan Adoption

Upon completion, copies of the Draft Local Hazards Mitigation Plan for the City of Easthampton were distributed to the city boards for their review and comment. A public meeting was held by the Easthampton City Council to present the draft copy of the Easthampton Local Natural Hazards Mitigation Plan to city officials and residents and to request comments from this committee and the general public. The Natural Hazards Mitigation Plan was formally approved by the City Council 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 Easthampton Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Easthampton City Council and approval by MEMA and FEMA. Specific city departments and boards will be responsible for ensuring the development of policies, ordinance revisions, and programs as described in Sections 5 and 6 of this plan. The Easthampton Natural Hazards Planning Committee will oversee the implementation of the plan.

Plan Monitoring and Evaluation

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

The Easthampton 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. Those parties noted in Section 6 of the plan, all of whom have a representative on the Easthampton Natural Hazards Planning Committee, will be responsible for seeing that the actions are implemented and will report on their progress at the annual plan review meetings.

Outreach to the public, surrounding communities, agencies, businesses, academia, non-profits, or other interested parties outside of the city of Easthampton will be done in advance of each annual meeting in order to solicit their participation in assessment of the plan. This will be done in the same manner as their participation was obtained during development of the plan. Following these discussions, it is anticipated that the committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different city 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 fall of 2011. The meetings of the committee will be organized and facilitated by the Emergency Management Director or the Easthampton City Council.

Incorporation of Plan Requirements into other Planning Mechanisms/Documents

At times when the city of Easthampton is considering creation of or changes to local planning documents or procedures including, but not limited to comprehensive plans, capital improvement plans, zoning and building codes site reviews and permitting processes the information and recommendations contained in this plan will be reviewed by the people and committees involved in those processes and, when appropriate, will incorporate those recommendations into the new planning procedures.

CERTIFICATE OF ADOPTION

CITY OF EASTHAMPTON, MASSACHUSETTS

MAYOR MICHAEL TAUTNIK

A RESOLUTION ADOPTING THE

EASTHAMPTON HAZARD MITIGATION PLAN

WHEREAS, the City of Easthampton established a Committee to prepare the Easthampton Hazard Mitigation plan; and

WHEREAS, several public planning meetings were held between October 2006 and November 2007 regarding the development and review of the Easthampton Hazard Mitigation Plan; and

WHEREAS, the Easthampton Hazard Mitigation Plan contains several potential future projects to mitigate hazard damage in the City of Easthampton; and

WHEREAS, a duly-noticed public hearing was held by the Easthampton City Council on _____, 2008 to formally approve and adopt the Easthampton Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Mayor of Easthampton adopts the Easthampton Hazard Mitigation Plan.

ADOPTED AND SIGNED this _____, 2008.

_____

Mayor Michael Tautznik
City of Easthampton

ATTEST

8 – 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
DFP Wetlands and Waterways……..XXX/XXX-XXX
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
Massachusetts Association of Regional Planning Agencies (MARPA)……...XXX/XXX-XXX
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
US Department of Commerce: National Oceanic and Atmospheric Administration: National Weather Service; Tauton, Massachusetts 508/824-5116
US Department of the Interior: US Fish and Wildlife Service 413/253-8200
US Geological Survey 508/490-5000

2) <u>Mitigation Funding Resources</u>

404 Hazard Mitigation Grant Program (HMGP) .....Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....Massachusetts Emergency Management Agency
Community Development Block Grant (CDBG)…….....DHCD, also refer to RPC
Dam Safety Program.....MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG) .....Massachusetts Emergency Management Agency
Emergency Generators Program by NESEC[‡] ....Massachusetts Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP) ..... Massachusetts Emergency Management Agency
Flood Plain Management Services (FPMS).....US Army Corps of Engineers
Mitigation Assistance Planning (MAP)..... Massachusetts Emergency Management Agency
Mutual Aid for Public Works.....Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP)[†] ..... Massachusetts Emergency Management Agency
Power of Prevention Grant by NESEC[‡].....Massachusetts Emergency Management Agency
Roadway Repair & Maintenance Program(s).....Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection …….....US Army Corps of Engineers
Section 103 Beach Erosion……...US Army Corps of Engineers
Section 205 Flood Damage Reduction……US Army Corps of Engineers
Section 208 Snagging and Clearing ....US Army Corps of Engineers
Shoreline Protection Program……MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....MA Department of Environmental Protection
Wetlands Programs ..... .MA Department of Environmental Protection

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

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

3) Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/ha zards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/dis aster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/g eog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.html	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://www.ghcc.msfc.nasa.gov/ot d.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://wwwep.es.llnl.gov/wwwep/g hp.html	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iiaa.iix.com/ndcmap.html	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Easthampton Hazard Mitigation Planning Committee
Meeting #1

AGENDA
October 30, 2006
9:00 a.m.

1) Introduction

2) Purpose of Committee
- Why selected to serve on Committee
- What we are doing and why

3) What is Hazard Mitigation Planning?
- PowerPoint Presentation on Hazard Mitigation

4) Step 1: Organize Hazard Mitigation Team
- Establish a chairperson/point of contact

5) What must we do to prepare a Hazard Mitigation Plan?
- Explain/set milestones (5 committee meetings)
- Agree on next committee meeting date

6) Question and Answer Period

Easthampton Hazard Mitigation Planning Committee
Meeting #2

AGENDA
December 12, 2006
9:00 a.m.

1) Identify Hazards (past and potential) on Base Map
- What are the hazards?
- What is at risk from those hazards?

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

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

3) Question and Answer Period

4) Set Goals for Next Meeting

Easthampton Hazard Mitigation Planning Committee
Meeting #3

AGENDA
January 9, 2007
9:00 a.m.
Easthampton Public Safety Complex

1) Hazards Analysis Methodology
- Past and Potential Hazards
- Critical Facilities
    - Is this information correct?

2) Review the PDM Plan
- Is the information correct?
- What is missing?

2) Analyze Development Trends
- Looking at Community Change
- Map out Development Patterns

4) Question and Answer Period

5) Set Goals for and Schedule Next Meeting

Easthampton Hazard Mitigation Planning Committee
Meeting #4

AGENDA
February 13, 2007
9:00 a.m.
Easthampton Public Safety Complex

1) Hazards Analysis Methodology
- Past and Potential Hazards (p.23-24 of draft plan)

2) Critical Facilities / Evacuation Routes Chart
- p.30 of draft plan

3) Identify what's in place & Identify gaps in the current protection
- Chapter 5 of Draft Plan (Current Mitigation Strategies)
- Review of Draft Existing Protection Measures
- Identify gaps in existing protection

4) Question and Answer Period

5) Set Goals for and Schedule Next Meeting

Easthampton Hazard Mitigation Planning Committee
Meeting #5

AGENDA
March 13, 2007
9:00 a.m.
Easthampton Public Safety Complex

1) Review of Draft Goal Statements

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

3) Question and Answer Period

Easthampton Hazard Mitigation Planning Committee
Meeting #6

AGENDA
April 11, 2007
9:00 a.m.
Easthampton Public Safety Complex

1) Prioritize List of Mitigation Actions in Order of Importance

2) Establish a Minimum Acceptable Level for Actions

3) Review / edits of final plan

4) Question and Answer Period

Easthampton Hazard Mitigation Planning Committee
Meeting #7

AGENDA
11/16/07
9:30 a.m.
Easthampton Public Safety Complex

1) **Introduction**

2) **Review FEMA comments on Draft Plan and discuss proposed changes to Plan**

3) **Discuss Next Steps for the Easthampton *Hazard Mitigation Plan* including FEMA Review and Adoption by the Board of Selectmen/City Council.**

4) **Question and Answer Period**

(Documentation of Public Notices)

PRESS RELEASE

CONTACT: Andrew Smith, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE
September 12, 2007

Public Input Sought on Pre-Disaster Mitigation Plans

The Pioneer Valley Planning Commission has completed final working drafts of pre-disaster mitigation plans for thirteen communities in the region: Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, and South Hadley.

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.

The draft plans are posted for public review and comment on PVPC's website at www.pvpc.org. Please submit comments to PVPC's Andrew Smith at (413) 781-6045 or asmith@pvpc.org no later than November 30, 2007. Communities with approved plans will be 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.

The Republican.

'Predisaster plans' readied for grants

Sunday, September 23, 2007

By NANCY H. GONTER
ngonter@repub.com

It's the public's turn to weigh in on plans prepared by local communities to keep the damage from natural disasters to a minimum.
Sixteen "predisaster mitigation plans," developed by the Pioneer Valley Planning Commission working with local officials from each community, are part of an effort to secure grant money from the Massachusetts Emergency Management Agency, said Catherine M. Miller, principal planner with the commission.

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

The plans, which average more than 100 pages each, can be viewed on the agency's Web site at www.pvpc.org Plans for Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southwick, Ware and Wilbraham are available, she said.

"This is largely an education exercise so people know local government is looking into these things and thinking about what the consequences of natural disasters would be. It's reassuring to know local governments are looking at this kind of thing especially after all the awareness following (hurricane) Katrina," Miller said.

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

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

Each plan looks at the risks communities may face from natural disasters such as flooding, tornadoes, drought and earthquakes, and what can be done to prevent damage to property and loss of life. They also prioritize projects for funding for mitigation efforts, Miller said.
An example of a mitigation project is Greenfield's purchase of the Wedgewood Gardens mobile home park which was badly flooded by the Green River in 2005 and had previously been flooded, although that was not part of this program, Miller said.

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

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

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

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

Sunday's news briefs

Posted by The Republican Newsroom September 30, 2007 12:04PM

Predisaster plan drafts
The Pioneer Valley Planning Commission has completed final working drafts of predisaster mitigation plans for 13 communities in the region. The draft plans are posted for public review and comment on the commission's Web site at www.pvpc.org. The deadline for comments is Nov. 30.

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. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

Affected are Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton and South Hadley.

Appendix C

List of Acronyms

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

Past and Potential Hazards/Critical Facilities Map