HAZARD MITIGATION PLAN UPDATE
ANNEX FOR THE TOWN OF MONTVILLE

Southeastern Connecticut Council of Governments
Multi-Jurisdictional Hazard Mitigation Plan Update

December 06, 2012

MMI #3570-05

Prepared for:

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ACKNOWLEDGEMENTS

This HMP annex update could not have been completed without the time and dedication of the following individuals at the local level:

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1.0 INTRODUCTION

1.1 Purpose of Annex

The purpose of this HMP annex is to provide an update to the hazard risk assessment and capability assessment provided in the previous HMP, and to evaluate potential hazard mitigation measures and prioritize hazard mitigation projects specific to mitigating the effects of hazards on the Town of Montville. Background information and the regional effects of pertinent hazards are discussed in the main body of the Southeastern Connecticut Council of Governments (SCCOG) Multi-Jurisdictional Hazard Mitigation Plan. Thus, this annex is designed to supplement the information presented in the Multi-Jurisdictional HMP with more specific detail for Montville and is not to be considered a standalone document.

The primary goal of this hazard mitigation plan annex is to identify particular vulnerability to hazards and potential mitigation measures for such hazards in order to ***reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources.*** This includes the reduction of public and private damage costs. Limiting losses of and damage to life and property will also reduce the social, emotional, and economic disruption associated with a natural disaster. Montville, with an approved Mitigation Plan, may apply for assistance from FEMA directly as a subgrantee through the state of Connecticut under the various grant programs.

1.2 Setting

Montville is a town of approximately 44 square miles that lies in west-central New London County and is bordered by the Towns of Preston and Ledyard to the east, the Town of Waterford to the south, the Towns of Salem and East Lyme to the west and the Town of Bozrah and City of Norwich to the north.

The most significant surface water body associated with Montville is the tidal Thames River which is the town's border with Preston and Ledyard to the east. The Thames River extends from Norwich to the north where it begins at the convergence of the Shetucket and Yantic Rivers, and flows southerly past New London Harbor into Fishers Island Sound.

Montville has several major transportation routes. The largest volume transportation route through Town is Interstate 395 (I-395) which extends from the Town of Waterford near the village of Uncasville in the south northward to the City of Norwich to the north. Running almost parallel to I-395 to the east and extending from the village of Uncasville to the City of Norwich is Route 32 which is the second largest route of egress with a north-south orientation in Montville. Route 2A, which connects Route 12 in the Town of Preston to I-395 in Montville, is the largest volume route of egress with an east-west orientation in Town. Routes 163 and 82 are two major east-west oriented routes of egress in Town with Route 82 extending east-west across northern Montville and Route 163 extending from Route 32 near the Oxoboxo River in southeastern Montville northwest and into the Town of Bozrah in northwestern Montville. Additionally, Route 85 moves traffic from the Waterford town line to the west of Lake Konomoc northwest to the town line with the Town of Salem.

1.3 Plan Development

The 2005 HMP and its annexes were developed through a series of meetings and the completion of written questionnaires, personal interviews, and workshops as described in the Multi-Jurisdictional HMP update. Since that time, the HMP has been available in municipal offices and available to emergency personnel. Since the update, residents have been encouraged to contact the Mayor, the Emergency Management Director, the Town Engineer or the Planning and Zoning Director or the Public Works Director with any concerns regarding emergency response or potential projects related to natural hazard damage.

It is important to note that Montville had its own single-jurisdiction Hazard Mitigation Plan developed in the year 2000 that was used to help develop the annex in 2005. Some of the information in the 2005 annex was carried forward from the earlier plan.

Based on the prior plan (2000), the existing plan (2005), existing information, and hazards that have occurred since 2005, SCCOG determined that the following data collection program would be sufficient to collect data to update the Multi-Jurisdictional plan and each annex.

- The SCCOG issued a press release on November 20, 2011 announcing a public information meeting on the multi-jurisdictional HMP update. This press release was published in the Norwich Bulletin and The Day. This notice was also posted on the SCCOG website. The public information meeting was held on December 13, 2011 at the SCCOG office.

- A data collection meeting was held with the Mayor, Emergency Management Director/Fire Marshal, Director of Public Works, Building Official and Town Planner on January 31, 2012 to discuss the scope and process for updating the plan and to collect information. The meeting focused on reviewing each section of the existing hazard mitigation plan and annex, critical facilities, and various types of hazards that have affected Montville and that should be addressed in the update.

- The draft that is sent for State review will be posted on the town of Montville's website (www.townofmontville.org/) as well as the SCCOG website (www.seccog.org) for public review and comment. In addition, a hard copy will be made available in the SCCOG office in Norwich. A press release will announce the availability of the HMP for review. This will provide residents, business owners, and other stakeholders throughout the SCCOG region the opportunity to review and comment on a relatively complete draft with all annexes. Comments received from the public will be incorporated into the final draft where applicable following State and Federal comments.

The adoption of this HMP update by the Town of Montville will be coordinated by SCCOG and the Mayor. The HMP update must be adopted within one year of conditional approval by FEMA, or Montville will need to update the HMP and resubmit it to FEMA for review. The adoption resolution is located in Appendix A of this annex.

1.4 Progress Monitoring

Following adoption, the Mayor will continue to administer and be the local coordinator of this HMP (as the Mayor has since 2005) under the authority of the Montville Town Council. The Mayor will coordinate with responsible departments as listed in Table 11-1 and ensure that the

recommendations of this HMP are considered or enacted. Refer to Section 1.8 of the Multi-Jurisdictional HMP for a description of how the local coordinator will perform progress monitoring. The majority of recommendations in this annex can be accomplished within or with only a slight increase in the operating budgets of the various departments. Projects that require capital improvements or additional funding will need to be approved by the Town Council.

The HMP will be on file in Town Hall at the Mayor's Office, available to all departments, to assist in guiding growth decisions. See Section 2.5 for recommendations related to integrating the findings of this HMP into additional town planning documents. Montville will continue to encourage town residents to contact the Mayor, with concerns related to natural hazards or emergency response via the town's website.

The town will review the status of Plan recommendations each year. The Mayor will be in charge of overseeing recommended projects and coordinating an annual meeting with applicable departments (those listed in Table 11-1) and other interested departments. Refer to Section 1.8 of the Multi-Jurisdictional HMP for a list of matters to be discussed at the annual meeting, including a review of each recommendation and progress achieved to date, or reasons for why the recommendation has not been enacted. The Mayor will keep a written record of meeting minutes and the status of the recommendations. These records of progress monitoring will form the basis for the next HMP update.

Montville understands that the multi-jurisdictional HMP and this annex will be effective for five years from the date of FEMA approval of the first SCCOG jurisdiction regardless of the date of adoption by SCCOG. The Mayor will coordinate with SCCOG for the next HMP update which is expected to occur in 2016-2017.

2.0 COMMUNITY PROFILE

2.1 Physical Setting

Montville is located in the west-central region of the SCCOG planning area. Elevations range from approximately 600 at the top of Chapel Hill near Montville Manor on Chapel Hill Road to sea level along the Thames River. Montville contains the villages of Chesterfield, Mohegan, Oakdale and Uncasville. Aside from the Mohegan Tribal Nation Reservation in the northeast corner of Montville (which is sovereign land rather than a part of the town), the most developed sections of Montville are the neighborhoods around Route 32 and Route 2A in the eastern section of town, and the village of Uncasville in southeastern Montville, extending northwest to Wheeler pond along Route 163 and Maple Avenue.

Western Montville contains a greater amount of undeveloped land and less dense development aside from the two large subdivisions, one located between Old Colchester Road and Chapel Hill Road and the other located on the corner of Chapel Hill Road and Chesterfield Road in the area known as "Four Corners." With the dense development in eastern Montville and the significantly less development in western Montville, the town maintains a rural to suburban nature.

Geology is important to the occurrence and relative effects of natural hazards such as earthquakes. Thus, it is important to understand the geologic setting and variation of bedrock and surficial formations in lands underlying Montville. Montville has thirteen bedrock formations which are generally situated in a northwest-southeast orientation. The Hope Valley Alaskite Gneiss Formation dominates the bedrock types in Montville covering approximately 36% of the Town's land, while approximately 28% of land is covered by the Plainfield Formation. The remaining approximately 36% of land area is covered by the remaining eleven formations.

Montville lies above the Honey Hill Fault zones oriented in this northwest-southeast direction. This zone is the location where Avalonia and North America met. The Honey Hill Fault is a significant fault zone that is considered moderately active by the Connecticut Department of Emergency Services and Public Protection and has been linked with recent small earthquake activity (on the order of 1 to 2 on the Richter scale) in East Haddam in April and May of 2012 as reported by the Weston Observatory at Boston College in Boston, Massachusetts.

Montville's surficial geologic formations include glacial till and stratified drift. Refer to the Multi-Jurisdictional HMP for a generalized view of surficial materials. Till contains an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. Areas adjacent to Latimer Brook, Bogue Brook, Bogue Brook Reservoir, Hunts Brook, Lake Konomoc, Sandy Brook, and their tributaries in southwestern Montville, Oxoboxo Brook, Fox Brook, Falls Brook, Stony Brook and their tributaries from northwest to southwest Montville, Trading Cove Brook along the northern town lines with Bozrah and Norwich, the Thames river along the eastern town lines with Preston and Ledyard and smaller tributaries have fairly extensive areas underlain by stratified drift.

The amount of stratified drift present is important as areas of stratified materials are generally coincident with floodplains. These materials were deposited at lower elevations by glacial streams, and these valleys were later inherited by the larger of our present day streams and rivers. The amount of stratified drift also has bearing on the relative intensity of earthquakes and the likelihood of subsidence.

2.2 Land Use and Development Trends

Montville was incorporated in 1786 from lands that were originally part of the North Parish of New London. The town includes the villages of Chesterfield, Mohegan, Oakdale and Uncasville. Montville began its industrial history as a mill community and by the 1880s the Town had 15 cotton, woolen, and paper mills on the Oxoboxo River alone. The town has maintained a close relationship with the Mohegan Tribe which has established one of the largest casino destination resorts in the world located mostly adjacent to the northeastern section of Town. Today, the town maintains a combination of its industrial history with a large amount of undeveloped land spread largely across the western half of town. The town also maintains a suburban feel, as a majority of residents commute to the nearby larger Cities of Norwich or New London.

According to the "2006 Land Cover by Area" University of Connecticut Center for Land Use Education and Research data for the town, Montville is dominated by deciduous forest land cover with 16,425 acres or approximately 58%, while land cover defined as developed covers only approximately 4,108 acres or 16% of town.

A buildout analysis in the *Plan of Conservation and Development* (POCD) (2010) considered building constraints including zoning regulations, slopes greater than 25 percent, wetlands, and floodplains. The analysis showed that Montville has approximately 15,534 acres or 55% of its land area that is potentially available for future development. The buildout analysis mentions that this figure could include the 3,017 acres of managed open space, which would decrease the land area to 12,517 acres or approximately 44% of potentially developable land.

Several areas in town are viewed by Town Officials as either being close to development or likely for development in the future:

- "The Village" is partially approved with a letter of intent from the United States Department of Housing and Urban Development. The development will consist of 160 units of townhouses off Route 32 near St. Bernard Drive to the south of Route 2A. Montville anticipates receiving a site plan soon.
- A fast food restaurant is approved.
- A 40 lot subdivision between Black Ash Road and Chesterfield Road is pending in the central-western portion of Town.
- Infill of various commercial projects along Route 32 is anticipated where development has not yet taken place.

The largest developable contiguous land area in town includes 300 acres between Route 32 and the Thames River south of Route 2A. Although development projects are not currently pending for this area, Montville anticipates that something will be proposed in the future.

The housing stock in Montville consists primarily of single family homes. The above-mentioned projects include single and multi-family housing developments in Town. It is likely that Montville will continue to be a suburban community in the future, with the majority of its commercial and industrial development focused along I-395 and Route 32 in the eastern half of town.

The POCD Update recommends the construction of a new Public Safety Building, the renovation of the Fair Oaks Community Center, the replacement of eleven bridges, the construction of a

transfer station gate building, the replacement and upgrading of drainage networks, the construction of a sand and salt shed, develop a diverse housing stock long-term, incorporation of Low Impact Development (LID) practices, retention and attraction of businesses, and use of GIS to develop a commercial buildout study. The construction of a new Public Safety Building will be completed in late 2012 and Police and dispatch personnel and resources will be relocated there.

2.3 Drainage Basins, Hydrology, and Geology

As mentioned in Section 1.2, the most significant surface water body in Montville is the Thames River. Additional significant watercourses include Oxoboxo Brook, Hunts Brook, Latimer Brook, Oil Mill Brook, Stony River, Whittle Brook/Gardner Lake (which becomes Gardner Brook) and Trading Cove Brook. Of the additional seven watercourses, only Latimer Brook and Oil Mill Brook both flow south westerly through the southwestern portion of town and Whittle Brook (Gardner Brook in Bozrah) which flows north-northwesterly through the northwestern portion of Montville, do not ultimately discharge to the Thames River. The remaining five watercourses flow southeast towards the Thames River moving from north to south through town is Trading Cove Brook, Stony Brook, Oxoboxo Brook and Hunts Brook. In total, there are approximately 16 named watercourses and many unnamed small tributaries in Montville.

There are a total of eight subregional watershed basins in Montville. The subregional basins are: Gardner Brook, Hunts Brook, Latimer Brook, Oil Mill Brook, Oxoboxo Brook, Stony Brook, Thames River and Trading Cove Brook. The Stony Brook and Oxoboxo subregional basins cover the majority of interior Montville and are adjacent to one another. The Oxoboxo Brook and Stony Brook subregional drainage basins cover the most land in town with 24% and 22% coverage, respectively.

The northwest corner of Montville is in the Gardner Brook subregional drainage basin which drains water to the north towards the Yantic River, while the Trading Cove Brook subregional basin stretches along most of the northern town line and drains to the Thames River. The Thames River subregional basin stretches from north to south along the eastern town line. The Hunts Brook drainage basin covers 17% of town draining water to the Thames River. The southwestern part of Montville is mostly covered by the Latimer Brook subregional basin (13% of the town) and a small portion is covered by the Oil Mill Brook subregional basin of which both drain directly to Long Island Sound through the Southeast Western Complex.

2.4 Governmental Structure

Montville is governed by a Mayor and Town Council form of government. The authority of town officials is granted by Connecticut General Statutes. The Town Council is the legislative branch of the town and is responsible for the administration of town policies. The Mayor is the chief elected official and is responsible for the day-to-day administration of Montville.

The Town of Montville has boards, commissions, authorities and committees that can take an active role in hazard mitigation including the Emergency Management Department, the Inland Wetlands and Watercourse Commission, the Planning and Zoning Commission, the Public Safety Commission, the Public Safety Building Committee, the Local Emergency Planning Committee and the Public Works/Solid Waste Standing Committee. Departments and commissions common to all municipalities in SCCOG were described in Section 2.8 of the Multi-Jurisdictional HMP.

More specific information for different departments, commissions committees, authorities and boards of the Town of Montville is noted below:

- The Town of Montville is served by four volunteer fire companies which also provide ambulance services. A paid Fire Fighter/Emergency Medical Technician (EMT) is located at each station. The four stations include the Montville Fire Company at 77 Route 163, the Mohegan Fire Company at 2029 Norwich-New London Turnpike (Route 32), the Oakdale Fire Company at 444 Chapel Hill Road and the Chesterfield Company at 1606 Route 85.

- The Building Official is primarily responsible to perform plan reviews, issue permits and conduct inspections, issue orders to remove illegal or unsafe conditions, require the necessary safeguards during construction and demolition and to interpret and provide guidance regarding codes.

- The Planning and Zoning Commission works with the Planning Department staff to produce land use and zoning regulations. The commission consists of nine members who are appointed by the Town Council to serve for a four year term. The Commission contributes to the production of Zoning Regulations and a mapping, the POCD and maps and site development guidelines.

- The Inland Wetlands Commission consists of seven members and two alternates who are appointed by the Town Council for a 4 year term. The commission works with the Planning Department to produce Inland Wetland Regulations and mapping and process wetlands permits while enforcing inland wetland regulations.

- The Public Works Department (PW) supervises and controls the maintenance of town-owned properties and parks. Additionally, the PW is responsible for the sweeping of roads, brush cutting on the side of roads, the preservation, care and removal of trees within highways or public places, cleaning of catch basins, paving, solid waste disposal and recycling.

- Emergency Management Department ensures the public's well-being and safety during emergencies and disasters. The Department is responsible for maintaining the Town's Emergency Operations Plans (EOPs) and Hazardous Materials Plan in accordance with State mandates. The Department is integrated with the Local Emergency Planning Committee which currently consists of seven members.

The roles of Town commissions, committees, authorizes, boards and departments have not changed since the time of the previous HMP. Thus, the Town of Montville is technically, financially, and legally capable of implementing mitigation projects for hazards to the extent that funding is available.

2.5 Review of Existing Plans and Regulations

Montville has different plans and regulations that recommend or create policies related to hazard mitigation. These policies and regulations are outlined in the Emergency Operations Plan (2008), POCD (2010), Zoning Regulations, Subdivision Regulations and Inland Wetlands and Watercourses Regulations. The Zoning Regulations were revised to December 15, 2011 to incorporate new NFIP requirements associated with the DFIRM available on July 18, 2011.

Emergency Operations Plan

The town has an Emergency Operations Plan (EOP) that is updated and certified by the Mayor annually. This document provides general procedures to be instituted by the Mayor and/or designee in case of an emergency. Emergencies can include but are not limited to hazard events such as hurricanes and nor'easters. The EOP is directly related to providing emergency services prior to, during, and following a hazard event.

Plan of Conservation and Development (2010)

The POCD was recently updated in 2010 with contributions from local boards, commissions, committees, citizens and citizen groups. The Plan seeks to be a statement of policies, goals and standards for the physical and economic development of the Town and recommends the most desirable uses types and population densities in various parts of the municipality. The Plan considers the potential impact of natural hazards and natural features such as steep slopes (those equal to or exceeding 20%) that could restrict development.

Zoning and Subdivision Regulations (2011)

The NFIP regulations for the Town of Montville are in Section 16.4 of the Zoning Regulations. The Subdivision Regulations discuss flooding considerations such as SFHAs and drainage networks in Section 5.8, and drainage infrastructure is discussed in many other locations within the Regulations.

Inland Wetlands and Watercourses Regulations (2011)

The Inland Wetlands and Watercourses Regulations in the Town of Montville require a permit for certain regulated activities that are within 50 feet or in a wetland or watercourse or that may impact a wetland or watercourse. These regulations build on the preventative flood mitigation provided by the Zoning Regulations by preventing fill and sedimentation that could lead to increased flood stages.

2.6 Critical Facilities, Sheltering Capacity, and Evacuation

Montville considers several facilities to be critical to ensure that emergencies are addressed while day-to-day management of the town continues. Critical facilities are presented on figures throughout this annex and summarized in Table 2-1. The Chesterfield Fire Company is partially in the Zone AE Special Flood Hazard Area (SFHA), while the Montville Fire Company is partially in the 0.2 Percent Annual Chance floodplain. These facilities are described in more detail below.

TABLE 2-1
Critical Facilities

Facility	Address or Location	Emergency Power?	Shelter?	In SFHA?
Emergency Services				
Montville Fire Company	77 Route 163	✓		
Mohegan Fire Company	2029 Norwich-New London Tpke (Route 32)	✓		
Oakdale Fire Company	444 Chapel Hill Road	✓		
Chesterfield Fire Company	1606 Hartford-New London Tpke (Rt. 85)	✓		✓
Public Safety Building	909 Norwich-New London Tpke (Rt. 32)	✓		
Municipal				
Town Hall*	310 Norwich-New London Tpke	✓		
Montville High School	800 Old Colchester Road	✓	✓	
Leonard J. Tyrell Middle School	166 Chesterfield Road	✓	✓	
Public Works Building	225 Maple Avenue	✓		
Cook Drive Water Tank	Cook Drive			
Montville (Pink Row) WPCF	83 Pink Row	✓		
Killeen Road Substation	Killeen Road			
Special Communities				
Orchard Grove Specialty Care Center	5 Richard Brown Drive	✓		
Haughton Cove Manor	841 Norwich-New London Tpke	✓		
Independence Village Elderly Housing	Milefski Drive			
Freedom Village Elderly Housing	Liberty Road			
Jensen's Hillcrest Mini Estates (age 40+)	Old Colchester Road			
Other Types				
Water & Wastewater Infrastructure	Various			

*Emergency Operations Center (EOC)

Fire Companies

Montville Fire Company – Montville Fire Company is comprised of 25 volunteer members with 12 EMTs and three emergency responders. The station has 10 fire trucks including rescue, engine and ladder types, two ambulances and at least two boats. MFC's oldest fire truck which was originally built in 1931 was restored with money raised entirely by the fire department. There is always a full-time paid firefighter on duty at this location.

Mohegan Fire Company – The Mohegan Fire Company occupies the central location in Montville and holds two fire engines, a heavy rescue truck, a brush truck, two service vehicles, a boat and an ambulance. The station is made up of approximately 60 volunteers. The Company constructed a second building to the rear of the Fire Station this year and it is used by members for additional storage for apparatus, equipment and a work area.

Oakdale Fire Company – The Oakdale Fire Company is comprised of a main building and garage. Its apparatus includes an attack engine, an engine/rescue, a tanker, two pick-up trucks used as support for firefighting including wildland fires, a special operations vehicle used for chemical incidents, water rescue, and as a back-up for motor vehicle accidents. There is always a full-time paid firefighter on duty at this location.

Chesterfield Fire Company – The Chesterfield Fire Company has two fire engines, a rescue truck, a brush truck, a service truck, an ambulance and a Sports Utility Vehicle (SUV) for the Fire Chief. This Fire Company is staffed 40 hours per week.

Municipal Facilities

Montville's Emergency Operations Center (EOC) is the Town Hall. The facility is fitted with a generator. Town Hall houses most of Montville's Town Departments and Officials which includes the Mayor, Planning Department, Zoning Enforcement Officer, Wetlands Agent, Building Department and Building Official and Emergency Management Department and Emergency Management Director.

A variety of useful information pamphlets regarding disaster preparations is on display at Town Hall. These are focused on fire safety, fire prevention, evacuation procedures, evacuating people with special needs, and preparing disaster supply kits.

The new Public Safety Building is an 18,000 square foot, approximately $6 million building located directly across the street from the State prison. The building includes the Resident State Trooper of the Connecticut State Police Troop E and municipal emergency dispatch services.

The Public Works Facility has a generator and houses the town's fuel supply for vehicles and equipment.

Communications and Shelters

The town's main shelter is the Montville High School. The facility is staffed by the American Red Cross (ARC) as needed, thereby being ARC-certified. The secondary shelter is the Leonard J. Tyrell Middle School which educates a reported 740 students. This facility is also ARC-certified.

The Town's dispatch services are through the new Public Safety Building mentioned above. The Town's communication with its residents, visitors, and businesses and its communications with outside emergency preparedness and response groups is believed inadequate. Reverse 9-1-1 through the CT Alert "Everbridge" Emergency Notification System is available for town residents as well. However, Tropical Storm Irene was significantly damaging for the town with many downed trees. Outages within Montville reached seven days in some areas. Communication and proactive actions should be improved and introduced in respect to the Town and to Connecticut Light & Power's (CL&P) tree trimming efforts.

The town should continue to encourage residents to sign up for the service via the CT Alert Emergency Notification System web site (http://www.ct.gov/ctalert/site/default.asp).

Special Communities and Other Types

The special communities in town include the Orchard Grove Nursing Home with a bedding capacity of approximately 130 beds, and the Haughton Cove Manor with approximately 12 beds. Both facilities have generators. Independence Village (40 units), Freedom Village (40 units) and Jensen's Hillcrest Mini Estates (Ages 40+) (150 units) have many residents that require oxygen. As a result, power outages in these areas are of concern. These are considered critical facilities.

Water and Wastewater

The "Pink Row" WPCF treats approximately four million gallons of residential, commercial and industrial wastewater per day which ultimately flows to the Thames River.

Various water and wastewater facilities throughout town include the Cook Drive Tank (owned and operated by the Montville WPCA) and the Richard Brown Drive Tank (owned and operated by Norwich Public Utilities). These are considered critical facilities.

Evacuation Routes

Annex E of Montville's EOP describes the town's evacuation plans. In Section V, under "Administration", the document states that the Evacuation Coordinator is responsible for maintaining complete records and reports associated with tracking the status of evacuation events including evacuation notices, the number of persons evacuated and the number of evacuees in shelter/mass care centers. Additionally, the Evacuation Coordinator is responsible for maintaining up-to-date evacuation route maps that depict designated primary and alternate evacuation routes.

Montville has several major routes of egress through Town. The largest volume transportation route through Town is Interstate 395 (I-395) which extends from the Town of Waterford near the village of Uncasville in the south northward to the City of Norwich to the north. Running almost parallel to I-395 to the east and extending from the village of Uncasville to the City of Norwich is Route 32 which is the second largest route of egress with a north-south orientation in Montville. Route 2A, which connects Route 12 in the Town of Preston to I-395 in Montville, is the largest volume route of egress with an east-west orientation in Town. Routes 163 and 82 are two major east-west oriented routes of egress in Town with Route 82 extending east-west across northern Montville and Route 163 extending from Route 32 near the Oxoboxo Brook in southeastern Montville northwest and into the Town of Bozrah in northwestern Montville. Additionally, Route 85 moves traffic from the Waterford town line to the west of Lake Konomoc northwest to the town line with the Town of Salem.

2.7 Status of 2005 Plan Recommendations

The previous HMP included several general recommendations related to mitigating hazards. The recommendations and a summary of actions taken over the past several years towards those actions are listed below. Where progress was indicated, the progress was paid for out of the Town's operating budget.

- Replace the bridge on Pink Row near the Montville WPCF –*This recommendation has not been completed and remains valid.*

- Pursue funding to conduct channel improvements and a bridge culvert replacement on Meeting House Lane – *This recommendation has not been completed and remains valid.*

- Pursue funding to conduct a culvert replacement on Old Colchester Road near Fair Oaks – This has not been done, but the Town has recently applied for funding under HMGP. *This recommendation has not been completed and remains valid.*

- Pursue funding to conduct drainage improvements at Murphy School – This has been completed. *This recommendation will not be pursued further.*

- Pursue funding to conduct drainage improvements to Route 32 South at Jerome Avenue – This has not been completed. Businesses including Wallach's Copper and Claudio's Tuxedo and a residence routinely are flooded. *This recommendation has not been completed and remains valid.*

- Develop a Flood Audit / Inventory Program – At present, the town suffers mainly from nuisance flooding. Montville is aware of the limited problem areas and floodplain development regulations restrict additional development within them. *This recommendation will not be pursued further.*

- Pursue funding to Conduct Property Protection and Public Information Projects Relative to Horton Cove – Projects were not completed. *This recommendation has not been completed and remains valid.*

- Perform a Catch Basin Survey – This has not been completed, however the Public Works Department surveys all catch basins every spring and attempts to do so prior to each major rainfall event. *This recommendation remains valid but essentially performed annually by the Public Works Department.*

3.0 INLAND FLOODING

3.1 Setting / Historic Record

Flooding is the primary hazard that impacts the town each year as documented in the previous HMP. While riverine flooding is of primary concern, most issues in town fall under nuisance flooding or poor drainage classification. Flooding is typically caused by heavy rainstorms, but can also be caused by relatively light rains falling on frozen ground. Flooding of roadways is more typical than damage to structures in the Town of Montville.

The March 2010 storms produced the most widespread flooding in Montville since the last HMP, causing basement flooding, roadway flooding, and a significant amount of nuisance flooding. The Montville Road bridge at the Norwich city line which traverses Trading Cove Brook has been closed since the March 2010 floods, however flooding via poor drainage remains as Montville's primary concern.

3.2 Existing Programs, Policies, and Regulations

The town attempts to mitigate inland flood damage and flood hazards by utilizing a wide range of measures including restricting activities in floodprone areas, replacing bridges and culverts, promoting flood insurance, maintaining drainage systems, through education and outreach, and by utilizing warning systems. These mitigation measures are budget-dependent. Many mitigation measures are common to all hazards and therefore were listed in Section 2.6. No structural flood control projects are located within or upstream of Montville, although some of the existing dams provide a small amount of flood mitigation.

Bridge Replacements, Drainage, and Maintenance

The Public Works Department cleans and inspects catch basins and culverts at least annually or more often if problems are noted. When flooding occurs, the Public Works Director or any of the four Fire Companies and/or Fire Marshal typically handles complaints from residents. For example, the Public Works department would inspect bridges and culverts and erect barricades to close roads, while the Fire Companies respond to calls requesting help for flooded basements. Drainage complaints are directed to the Public Works Director.

Regulations, Codes, and Ordinances

Montville has planning and zoning tools in place that incorporate floodplain management. The Town also has Subdivision Regulations that require adequate drainage be provided to reduce exposure to flood hazards and incorporate floodplain management. Inland Wetlands and Watercourses Regulations cover development in and/or near inland wetland areas.

Acquisitions, Elevations, and Property Protection

Montville has not performed acquisitions or elevations of floodprone property. Property protection has focused instead on preventive measures and maintaining and upgrading drainage systems as allowed by the budget.

Flood Watches and Warnings

The Mayor and the Fire Companies access weather reports through the National Weather Service and local media. In addition, Montville participates in the CT Alerts "Everbridge" Emergency Alerting and Notification Reverse 9-1-1 System which provides the town the ability to telephone weather warnings into geographically specific areas when storms are imminent.

3.3 Vulnerabilities and Risk Assessment

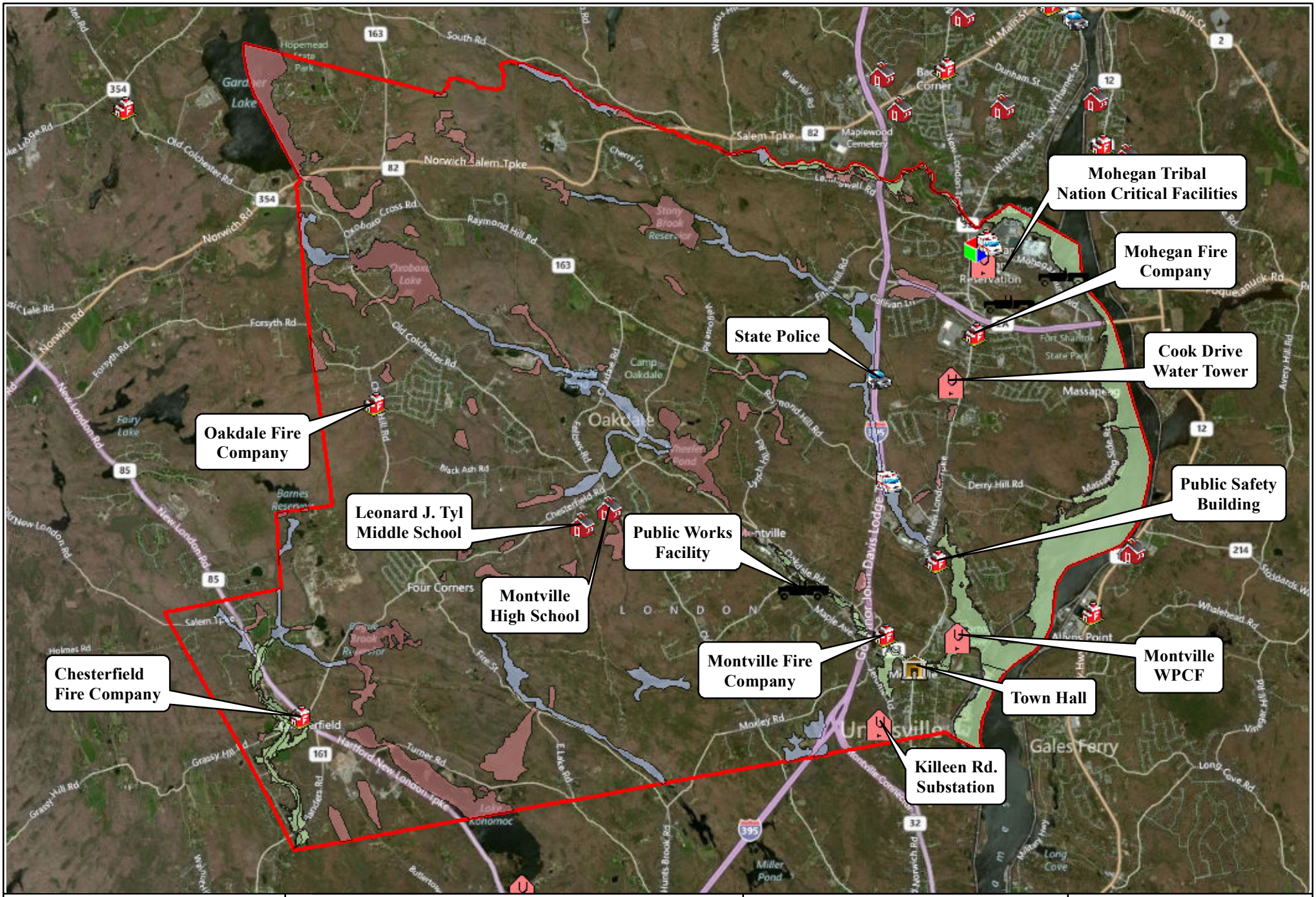
This section discusses specific areas at risk to inland flooding within Montville.

3.3.1 Vulnerability Analysis of Areas along Watercourses

Parts of the Latimer Brook, Oxoboxo Brook, Trading Cove Brook, the Thames River, Deep Hollow Brook, Hunts Brook, Bogue Brook, Sandy Brook, Fox Brook, Neck Brook, Falls Brook and Stony Brook all have a Special Flood Hazard Area (SFHA) associated with them. Sections of Latimer Brook, Oxoboxo Brook, Trading Cove Brook and the Thames River are mapped as the SFHA Zone AE, indicating that flood elevations are available. Additional mapped SFHA floodplains are Zone A, indicating that elevations are not available. As previously discussed, there are a few areas of town that flooding is hazardous to residents, buildings, or roadways. Those areas are discussed in Section 3.1 and listed below; refer to Figure 3-1 for the location of SFHAs within Montville:

- Laurel Point Drive near Oxoboxo Lake floods ever year due to poor drainage in the area.
- Maple Avenue near the Town Hall floods annually and water inundates the road. Wetlands are located on both sides of the road and it is possible that Route 163 road work contributes to the flooding on the street.
- According to officials, Fitch Hill Road at Old Fitch Hill Road appears to be drainage-related flooding.
- Faria Marine Instruments at 385 Norwich – New London Turnpike is located at the end of the Oxoboxo Brook system and the basement is repeatedly flooded.
- The basements of Countryside Condominiums are constantly inundated. The flooding is related to poor drainage and it is noted by Town Officials that the land between the condominiums and the school is often wet.
- The Repetitive Loss Property (RLP) on Lake Drive East may experience basement flooding. It appears that the home has a walk-out basement in the rear with wetlands behind.

Montville has several major transportation routes. The largest volume transportation route through Town is Interstate 395 (I-395) which extends from the Town of Waterford near the village of Uncasville in the south northward to the City of Norwich to the north. Running almost parallel to I-395 to the east and extending from the village of Uncasville to the City of Norwich is Route 32 which is the second largest route of egress with a north-south orientation in Montville. Route 2A, which connects Route 12 in the Town of Preston to Interstate 395 in Montville, is the largest volume route of egress with an east-west orientation in Town.



SOURCE(S):
FEMA, Microsoft Bing Maps Hybrid, SCCOG

N

Figure 3-1: FEMA Special Flood Hazard Areas

SCCOG HMP Update
Town of Montville Annex

LOCATION:
Montville, CT

Map By: SMG
MMI#: 3570-05
MXD: H:\3570-05\GIS\Maps\Montville\Figure 3-1.mxd
1st Revision: 7/7/2012
Revision: 7/19/2012
Scale: 1 in = 8,000 ft

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In addition, Route 163 and Route 82 are two major east-west oriented routes of egress in Town with Route 82 extending east-west across northern Montville and Route 163 extending from Route 32 near the Oxoboxo River in southeastern Montville northwest and into the Town of Bozrah in northwestern Montville. Additionally, Route 85 moves traffic from the Waterford town line to the west of Lake Konomoc northwest to the town line with the Town of Salem.

The DFIRM mapping suggests that these transportation routes can be negatively affected by extreme flooding. Additionally, the 2005 recommendation of Route 32 South at Jerome Avenue drainage improvements recommendation mentioned in Section 2.7 above and the damage to Tech-Air, Inc. and the road work on Route 163 reinforce the DFIRM mapping. The DFIRM mapping shows FEMA flood zones stretching across I-395 and Routes 32, 2A, 12, 163, 82 and 85 at different areas. It is understood that some of these are mapped where culverts cross these routes and may not be affected. However, some culverts may be undersized or somehow inundate the roadway another way. According to town officials, the most problematic areas of flooding associated with transportation through town is sections of Routes 32 and 163 described above.

3.3.2 Vulnerability Analysis of Private Properties

As noted in Table 3-4 of the Multi-Jurisdictional HMP, a total of 96 structures in Montville appear to be located in an SFHA floodplain. The majority of these structures are located along Oxoboxo Brook, near Horton Cove and in close proximity along the Thames River. Structures include residential, commercial and industrial with residential structures being accounting for the majority.

Town personnel indicate that structures typically do not get flooded in Montville due to riverine or overbank flood conditions, despite their locations in SFHAs. As shown in Table 3-5 of the Multi-Jurisdictional HMP, there is one repetitive loss properties in town. This property is located along Oxoboxo Lake. Repetitive Loss Properties are those which have received two or more claim payments of more than $1,000 from the NFIP with any rolling 10-year period for the home or business.

3.3.3 Vulnerability Analysis of Critical Facilities

As noted in Section 2.6 one of the critical facilities, the Chesterfield Fire Company is located in an SFHA flood zone, Zone AE, while the Montville Fire Company is located in the 0.2 Percent Annual Chance floodplain. With respect to critical facilities, these two locations are of some concern to the Town in conjunction with flooding and should be included in the Town's critical facilities flooding considerations.

3.4 Potential Mitigation Measures, Strategies, and Alternatives

Potential mitigation measures for reducing or eliminating the impact of inland flooding fall into the categories of prevention, property protection, emergency services, public education and awareness, natural resource protection, and structural projects. General potential mitigation measures that can be taken to reduce the effects of inland flooding were discussed in Section 3.7 and in Section 11.2.2 of the Multi-Jurisdictional HMP. General recommendations pertinent to all natural hazards that could affect the town are listed in Section 11 of this annex, as are specific measures pertinent to reducing inland flooding in the Montville.

4.0 COASTAL FLOODING

4.1 Setting / Historic Record

Despite being located inland from the Connecticut shoreline, the Town of Montville has coastal resource areas that are tidally influenced along the Thames River. The shoreline of Montville contains a combination of undeveloped and developed shorefront with estuarine embayments at Horton Cove, Bartlett Cove, Smith Cove, and elsewhere. The coastal resources found in Connecticut and described by DEEP are listed in the Multi-Jurisdictional HMP.

Homes, businesses, and industry are located in close proximity to the shorefront along the coastal area. However, the Town's inland location places many properties at higher elevations than typical coastal low-lying areas adjacent to Long Island Sound. As such, the town does not typically experience coastal flooding. While coastal flooding is relatively infrequent, hurricanes and tropical storms have the potential to induce coastal flooding and storm surge that can impact structures. No coastal flooding or storm surge events have occurred since the time of the previous HMP. However, the Town may be concerned with the potential long-term effects of sea level rise and its potential to exacerbate coastal flooding conditions in the future.

4.2 Existing Programs, Policies, and Regulations

Montville primarily attempts to mitigate coastal flood damage and flood hazards by controlling and restricting activities in floodprone areas and the coastal management area, maintaining hard structures in good condition, and providing signage and warning systems. Many of the existing programs, policies, and mitigation measures utilized in the Town for inland flood mitigation (Section 3.2) are also applicable to coastal flood mitigation, and additional programs were listed in Section 2.5.

The shoreline of Montville contains many flood and erosion control structures. Private bulkheads can be found in many of the residentially, commercially and industrially developed coastal neighborhoods. The Richards Grove neighborhood is a good example of residential properties with shoreline protection structures. The shorelines of the NRG facility and the neighboring industrial facilities are developed with riprap and bulkheads. The railroad line that runs almost parallel to Route 32 forms an embankment along parts of the Thames shoreline. In particular, the railroad embankment separates Smith Cove and Horton Cove from the Thames River.

As noted in Section 3.2 and Section 2.5, the town utilizes the Special Flood Hazard Areas delineated by FEMA. These consist of the 1% annual chance floodplain with elevations (Zone AE) including floodway areas. As noted by the Zoning Regulations, building activities in the floodplain are restricted and new construction or substantial redevelopment must prove that the lowest horizontal member of the new construction will be above the base flood elevation. In addition, the town requires the submission of a coastal site plan for any project located within the coastal area management boundary.

Like many communities, the town lacks existing policies and mitigation measures that are specifically designed to address sea level rise. Although the Town of Montville does not currently have a specific plan to address sea level rise, important pieces are in place in the form of the codes and regulations cited in this HMP that have been enacted to minimize storm, erosion,

and flood damage to structures. Specific language addressing sea level rise should be reviewed when updating pertinent planning documents moving forward.

4.3 Vulnerabilities and Risk Assessment

This section discusses specific areas at risk to coastal flooding within Montville. This flooding can be the result of astronomical high tides, hurricanes, nor'easters, or storm surge. Historic record coastal flooding typically only occurs due to storm surge. Refer to Figure 4-1 for a depiction of areas susceptible to storm surge.

Note that *HAZUS-MH*, FEMA's hazard loss estimation software, was utilized to calculate the potential damages to the Town of Montville from a combined 1% annual chance riverine and coastal flood. Results were presented in Section 3.5.2 of the Multi-Jurisdictional HMP.

4.3.1 Vulnerability Analysis of Areas along Coastal Waters

The area potentially flooded by storm surge is not as extensive as the SFHA floodplain. In general, the coastal area affected by storm surge is limited to areas immediately adjacent to the Thames River.

In general, it is assumed that as sea level rises, the frequency and magnitude of coastal flooding in the town will increase, with structures and roadways closest to existing sea level being affected the quickest.

Coastal erosion is generally not an issue in the Town of Montville since much of the shorefront is either fully developed (particularly along the NRG facility and adjacent industrial facilities) or characterized by elevated bedrock. However, as sea level rises, the effectiveness of these structures could be undermined such that erosion will be able to occur landward of riprap, bulkheads, and embankments, thus necessitating expansion of the structures.

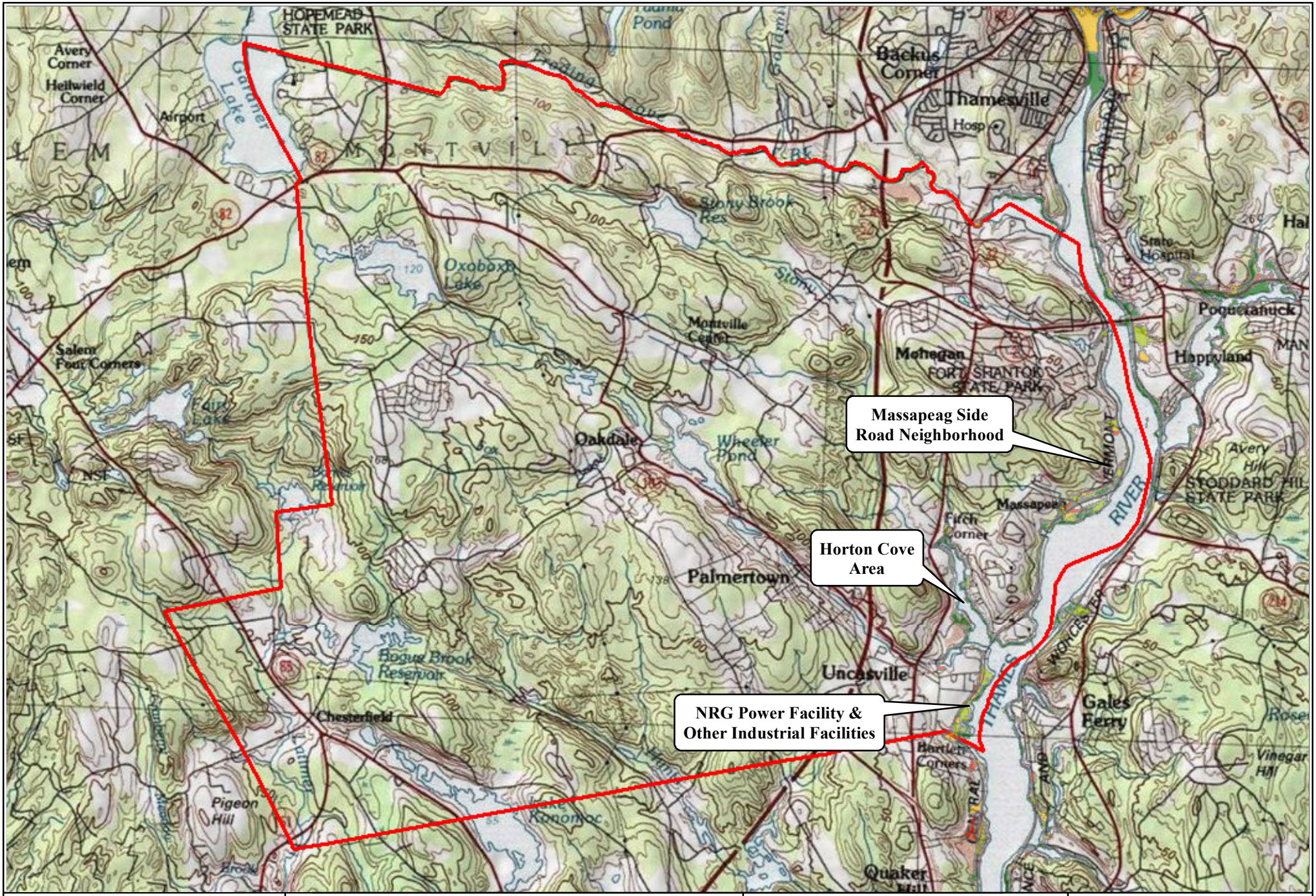
4.3.2 Vulnerability Analysis of Private Properties

The coastal areas of the Town of Montville have properties that are inhabited year-round. This intensifies risk to life and property in coastal areas. Waterfront properties are very susceptible to damage from storm surge although FEMA has not established any coastal velocity zones in Montville.

Buildings located in flood hazard areas are primarily commercial or industrial but also include some residential and critical facility structures as noted in Section 4.3.1. Most of the structures that are threatened by flooding are also located within a SFHA.

4.3.3 Vulnerability Analysis of Critical Facilities

As shown on Figure 4-1, critical facilities are not located within potential storm surge areas.



SOURCE(S):
FEMA, USGS Topographic Map (ESRI)

N

Figure 4-1: FEMA Hurricane Surge Zones

SCCOG HMP Update
Town of Ledyard Annex

LOCATION:
Montville, CT

Map By: SMG
MMI#: 3570-05
MXD: C:\Documents and Settings\shawng\Desktop\Figure 4.mxd
1st Revision: 7/7/2012
Revision: 7/19/2012
Scale: 1 in = 8,000 ft

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4.4 Potential Mitigation Measures, Strategies, and Alternatives

General potential mitigation measures that can be taken to reduce the effects of coastal flooding were discussed in Section 4.7 and in Section 11.2.2 of the Multi-Jurisdictional HMP. General recommendations pertinent to all natural hazards that could affect the Town are listed in Section 11 of this annex along with general and specific measures pertinent to reducing coastal flooding in Montville under the categories of prevention and structural projects.

5.0 HURRICANES AND TROPICAL STORMS

5.1 Setting / Historic Record

Several types of hazards may be associated with tropical storms and hurricanes including heavy or tornado winds, heavy rains, and flooding. Flooding hazards are discussed in Section 3 of this annex. Wind hazards are widespread and can affect any part of Montville. However, some buildings in Town are more susceptible to wind damage than others.

The last major hurricane or tropical storm wind event to affect the town was associated with Tropical Storm Irene in August 2011. Sections of and entire trees fell throughout the town and the region causing power outages that lasted up to seven days in Town. Communication between Connecticut Light & Power (CL&P) and the Town must improve to not repeat a power outage on the scale of the one following Tropical Storm Irene in the future.

5.2 Existing Programs, Policies, and Mitigation Measures

Wind loading requirements for new buildings are addressed through the Connecticut Building Code which is utilized by the town. Effective December 31, 2005, the design wind speed for the Montville is 115 miles per hour.

Parts of trees (limbs) or entire tall and older trees may fall during heavy wind events, potentially damaging structures, utility lines, and vehicles. In Montville, the Public Works Director is the Tree Warden has maintains a modest budget for tree maintenance and contracts the work to a contractor who is on call.

According to Town Officials, their personnel fully understand which roadways need to be prioritized for clearing following a significant storm, whereas CL&P may not have the same priorities. They also point to the Town and SCCOG having GIS capabilities that could be employed following significant storms such as Tropical Storm Irene, that provide the tools to conduct regional data collection and assessment which could facilitate clean-up and response. According to Town Officials, following Hurricane Bob in 1991, information regarding damage and clean-up was manually plotted to aid in response. Improved communication between CL&P and the Town is of high priority to aim to limit the amount of time that residents and businesses lose power following a significant weather event such as the seven days many experienced following Tropical Storm Irene.

Although the Town has language in its Subdivision Regulations requiring utilities and facilities to be located and constructed to minimize or eliminate flood damage, the Town does not have a specific requirement requiring that utilities be located underground. However, according to Town Officials placing utilities underground is in practice in new subdivisions. It is either prohibitively expensive or not feasible to place utilities underground in many areas of town because these areas are underlain by shallow bedrock.

Warning is one of the best ways to prevent damage from hurricanes and tropical storms, as these storms often are tracked well in advance of reaching Connecticut. The town can access National Weather Service forecasts via the internet as well as listening to local media outlets (television, radio) to receive information about the relative strength of the approaching storm. This

information provides the resources needed to determine whether or not to activate its EOP and encourage residents to take protective or evacuation measures if appropriate.

Residents are currently able to sign up to receive warnings from the CT Alert "Everbridge" Emergency Notification System to receive critical information specific to different areas within Montville. Although hurricanes that have impacted Montville have historically passed in a day's time, additional regional shelters could be outfitted following a storm with the assistance of the American Red Cross on an as-needed basis for long-term evacuees.

5.3 Vulnerabilities and Risk Assessment

All of Montville is vulnerable to hurricane and tropical storm wind damage and from any tornadoes (Section 6) accompanying the storm, as well as inland flooding (Section 3). Of particular concern are the blockage of roads and the damage to the electrical power supply from falling trees and tree limbs. As mentioned, there was a town-wide seven day power outage following Tropical Storm Irene in 2011 due to tree damage to utility lines.

Many structures built in Town do not meet current wind load building codes and are particularly susceptible to roof and window damage from high wind events. This risk to structures will be reduced with time as these buildings are remodeled or replaced with buildings that meet current codes. Those newer structures put in place since the 1990s are less vulnerable to damage from hurricanes and/or tropical storms.

The damage of a hurricane could cause a moderate economic impact to Montville. The potential economic effect of wind damage to SCCOG was evaluated in the Multi-Jurisdictional HMP. A separate analysis was not performed specifically for Montville.

5.4 Potential Mitigation Measures, Strategies, and Alternatives

Potential mitigation measures for reducing or eliminating the impact of wind damage fall into the categories of prevention, property protection, emergency services, public education and awareness, natural resource protection, and structural projects. General potential mitigation measures that can be taken to reduce the effects of wind damage from hurricanes and tropical storms were discussed in Section 5.7 and in Section 11.2.3 of the Multi-Jurisdictional HMP. General recommendations pertinent to all natural hazards that could affect the town are listed in Section 11 of this annex, as are specific measures pertinent to reducing wind damage to Montville.

6.0 SUMMER STORMS AND TORNADOES

6.1 Setting / Historic Record

Similar to hurricanes and winter storms, wind damage associated with summer storms and tornadoes has the potential to affect any section of Montville. Furthermore, because these types of storms and the hazards that result (flash flooding, wind, hail, and lightning) might have limited geographic extent, it is possible for a summer storm to harm one area within the town without harming another. Such storms occur in the town each year, although hail and direct lightning strikes to the town are rarer. No tornadoes have occurred in the town since the last HMP.

6.2 Vulnerabilities and Risk Assessment

Warning is the most viable and therefore the primary method of existing mitigation for tornadoes and thunderstorm-related hazards. The NOAA National Weather Service issues watches and warnings when severe weather is likely to develop or has developed, respectively. The Town can access National Weather Service forecasts via the internet as well as listen to local media outlets (television, radio) to receive information about the relative strength of the approaching storm. This information allows the town to activate its EOP and encourage residents to take protective measures if appropriate.

Aside from warnings, additional methods of mitigation for wind damage are employed by the town as explained in Section 5.2 within the context of hurricanes and tropical storms. In addition, the Connecticut Building Code includes guidelines for the proper grounding of buildings and electrical boxes to protect against lightning damage.

6.3 Vulnerabilities and Risk Assessment

Summer storms are expected to occur each year and are expected to at times produce heavy winds, heavy rainfall, lightning, and hail. All areas of the town are equally likely to experience the effects of summer storms. The density of damage is expected to be greater near the more densely populated area of the town.

Most thunderstorm damage is caused by straight-line winds exceeding 100 mph. Experience has generally shown that wind in excess of 50 miles per hour (mph) will cause significant tree damage during the summer season as the effects of wind on trees is exacerbated when the trees are in full leaf. The damage to buildings and overhead utilities due to downed trees has historically been the biggest problem associated with wind storms. Heavy winds can take down trees near power lines, leading to the start and spread of fires. Such fires can be extremely dangerous during the summer months during dry and drought conditions. Fortunately, most fires are quickly extinguished due to the town's strong fire response.

Lightning and hail are generally associated with severe thunderstorms and can produce damaging effects. All areas of the town are equally susceptible to damage from lightning and hail, although lightning damage is typically mitigated by warnings and proper grounding of buildings and equipment. Hail is primarily mitigated by warning, although vehicles and watercraft can often not be secured prior to the relatively sudden onset of a hailstorm. Lightning and hail are considered likely events each year, but typically cause limited damage in the town. Older buildings are most susceptible to lightning and hail damage since many were constructed prior to

current building codes, and many campgrounds offer little structural protection from the elements.

Although tornadoes pose a threat to all areas of Connecticut, their occurrence is least frequent in New London County as compared with the rest of the Connecticut. Thus, while the possibility of a tornado striking the town exists, it is considered to be an event with a very low probability of occurrence.

6.4 Potential Mitigation Measures, Strategies, and Alternatives

General potential mitigation measures that can be taken to reduce the effects of wind damage were discussed in Section 5.7 and in Section 11.2.3 of the Multi-Jurisdictional HMP. No additional recommendations are available specific to reducing damage from summer storms and tornadoes. Refer to Section 11 of this annex for recommendations related to wind damage and general recommendations related to emergency services in Montville.

7.0 WINTER STORMS AND NOR'EASTERS

7.1 Setting / Historic Record

Similar to hurricanes and summer storms, winter storms have the potential to affect any area of the town. However, unlike summer storms, winter storms and the hazards that result (wind, snow, and ice) have more widespread geographic extent. In general, winter storms are considered highly likely to occur each year (major storms are less frequent), and the hazards that result (nor'easter winds, snow, and blizzard conditions) can potentially have a significant effect over a large area of the town.

Winter storms and nor'easters have affected the town since the last HMP as reported to the NCDC and reported by Town Officials. In particular, the winter storms of 2010-2011 had a significant effect on Montville due to the significant snowfall:

- At the St. Thomas More School cafeteria in the Oakdale village of Montville, the roof was heard making noises due to strain, so the facility was evacuated and the roof was cleared.
- At the Stop and Shop supermarket, steel wall studs lost flex and sheetrock cracked and the store was shut down while the roof was cleared.
- A few businesses in Montville cleared their own roofs and the Montville Public Schools all cleared their own roofs.
- A residence on Laurel Point Road was evacuated, but did not fail.
- Some mobile homes suffered damage to overhangs.

Winter Storm Alfred in late October 2011 produced heavy snow to only the northwest part of Town as the southeast section did not receive any snow. This was partly due to the significant change in elevation in Town which ranges from around 600 feet to sea level, resulting in microclimate effects.

7.2 Existing Programs, Policies, and Mitigation Measures

Existing programs applicable to winter storm winds are the same as those discussed in Sections 5.2 and 6.2. Programs that are specific to winter storms are generally those related to preparing plows and sand and salt trucks; tree trimming and maintenance to protect power lines, roads, and structures; and other associated snow removal and response preparations.

The Connecticut Building Code specifies that a pressure of 30 pounds per square foot be used as the base "ground snow load" for computing snow loading for roofs. This specification is adhered to by the Town.

As it is almost guaranteed that winter storms will occur annually in Connecticut, it is important to locally budget fiscal resources toward snow management. Snow is the most common natural hazard requiring additional overtime effort from town staff, as parking lots and roadways need constant maintenance during storms.

The Public Works Department oversees snow removal in the town. The Connecticut Department of Transportation (DOT) plows the State roadways, while the town employs 21 plow trucks that navigate 140 miles of Town roads. The Public Works Director assigns routes and routes are

prioritized. The Public Works Director does not maintain a map or list due to potential liability issues, as past experiences have brought this issue to the surface.

7.3 Vulnerabilities and Risk Assessment

Severe winter storms can produce an array of hazardous weather conditions, including heavy snow, microclimates, blizzards, freezing rain and ice pellets, flooding, heavy winds, and extreme cold. Further "flood" damage could be caused by flooding from frozen water pipes. Often, tree limbs on roadways are not suited to withstand high wind and snow or ice loads.

Warning and education can prevent most injuries from winter storms. Most deaths from winter storms are indirectly related to the storm, such as from traffic accidents on icy roads and hypothermia from prolonged exposure to cold. Damage to trees and tree limbs and the resultant downing of utility cables are a common effect of these types of events. Secondary effects can include loss of power and heat.

There are a significant number of steep slopes such that extra sanding and salting of the roadways is instrumental in locations and are prioritized to alleviate the most troublesome locations first. Although Town Officials did not note that steep slopes are a major issue in Town, high traffic volume roadways with steep slopes should be given high priority when Town staff begins roadway treatment. This is usually the case.

7.4 Potential Mitigation Measures, Strategies, and Alternatives

Potential mitigation measures for flooding caused by nor'easters include those appropriate for flooding that were discussed in Section 3.7 of the Multi-Jurisdictional HMP and Section 11 of this annex. However, winter storm mitigation measures must also address blizzards, snow, and ice hazards. General potential mitigation measures that can be taken to reduce the effects of wind damage were discussed in Section 5.7 and in Section 11.2.3 of the Multi-Jurisdictional HMP and Section 11 of this annex.

8.0 EARTHQUAKES

8.1 Setting

An earthquake is a sudden rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse; disrupt gas, electric, and telephone lines; and often cause landslides, flash floods, fires, avalanches, and tsunamis. Earthquakes can occur at any time and often without warning. Detailed descriptions of earthquakes, scales, and effects can be found in Section 8 of the Multi-Jurisdictional HMP. Despite the low probability of an earthquake occurrence, earthquake damage presents a potentially catastrophic hazard to the town.

Although no major earthquakes have affected Montville since the last HMP, Montville lies above the Honey Hill Fault zone. The Honey Hill Fault is a significant fault zone that is considered moderately active by the Connecticut Department of Emergency Services and Public Protection and has been linked with recent small earthquake activity (on the order of one to two on the Richter scale) in East Haddam in April and May of 2012 as reported by the Weston Observatory at Boston College in Boston, Massachusetts. However, it is very unlikely that the Town of Montville would be at the epicenter of a damaging earthquake.

8.2 Existing Programs, Policies, and Mitigation Measures

The Connecticut Building Codes include design criteria for buildings specific to each region as adopted by Building Officials and Code Administrators (BOCA). These include the seismic coefficients for building design in Montville. The town has adopted these codes for new construction, and they are enforced by the Zoning Enforcement Officer.

Due to the infrequent nature of damaging earthquakes, town land use policies do not directly address earthquake hazards. However, the potential for an earthquake and emergency response procedures is addressed in the town's EOP.

8.3 Vulnerabilities and Risk Assessment

Surficial earth materials behave differently in response to seismic activity. Unconsolidated materials such as sand and artificial fill can amplify the shaking associated with an earthquake. As noted in Section 2.1, there are many areas throughout town that are underlain by stratified drift. These areas are likely more at risk for earthquake damage than the areas of the town underlain by glacial till. The best mitigation for future development in areas of sandy material is the application of the most stringent standards in the Connecticut Building Code, exceeding the building code requirements, or, if the town deems necessary, the possible prohibition of new construction. Those areas not at increased risk during an earthquake due to unstable soils are the areas underlain by glacial till.

Unlike seismic activity in California, earthquakes in Connecticut are not associated with specific active fault lines where tectonic plates meet. However, bedrock in Connecticut and New England in general is typically formed from relatively hard metamorphic rock that is highly capable of transmitting seismic energy over great distances. For example, the relatively strong earthquake that occurred recently in Virginia was felt in Connecticut because the energy was transmitted over a great distance through such hard bedrock.

As noted in Section 2.1 and above, Montville lies above the Honey Hill Fault zone. The Honey Hill Fault is a significant fault zone that is considered moderately active by the Connecticut Department of Emergency Services and Public Protection and has been linked with recent small earthquake activity in East Haddam, on the order of 1 to 2 on the Richter scale. Towns that are intersected by this fault zone are considered at moderate risk for very low-intensity earthquakes such as those experienced in East Haddam.

The built environment in Montville primarily includes some more recent construction that is seismically designed. However, most buildings were built before the 1990s and therefore are not built to current building codes. In addition, there are areas such as town parks with recreational buildings or shelters that may not be seismically designed. Thus, it is believed that most buildings would be at least moderately damaged by a significant earthquake. Those town residents who live or work in older, non-reinforced masonry buildings are at the highest risk for experiencing earthquake damage.

Areas of steep slopes can collapse during an earthquake, creating landslides. As mentioned previously, Montville has multiple areas of steep slopes and bluffs although almost all of these features occur in undeveloped areas. Thus, landslides are not a concern in the Town.

Seismic activity can also break utility lines such as water mains, gas mains, electric and telephone lines, and stormwater management systems. Damage to utility lines can lead to fires, especially in electric and gas mains. Dam failure can also pose a significant threat to developed areas during an earthquake. For this HMP, dam failure has been addressed separately in Section 10.0. As noted previously, most utility infrastructure in the town is located above ground. A quick and coordinated response with CL&P will be necessary to inspect damaged utilities following an earthquake, to isolate damaged areas, and to bring backup systems online. This is covered in the Montville and CL&P's EOPs.

A *HAZUS-MH* analysis of the potential economic and societal impacts to the SCCOG region from earthquake damage is detailed in the Multi-Jurisdictional HMP. The analysis addresses a range of potential impacts from any earthquake scenario, estimated damage to buildings by building type, potential damage to utilities and infrastructure, predicted sheltering requirements , estimated casualties, and total estimated losses and direct economic impact that may result from various earthquake scenarios.

8.4 Potential Mitigation Measures, Strategies, and Alternatives

Due to the low probability of occurrence, potential mitigation measures related to earthquake damage primarily include adherence to building codes and emergency response services. Both of these are mitigation measures common to all hazards as noted in Section 11 of this annex. The Multi-Jurisdictional HMP also includes additional recommendations for mitigating the effects of earthquakes that are also listed in Section 11.

9.0 WILDFIRES

9.1 Setting / Historic Record

Wildfires are considered to be highly destructive, uncontrollable fires. The most common causes of wildfires are arson, lightning strikes, and fires started from downed trees hitting electrical lines. Thus, wildfires have the potential to occur anywhere and at any time in both undeveloped and developed areas of Montville. Structural fires in higher density areas of the Town are not directly addressed herein. According to the Town officials, no specific areas of wildfire risk or vulnerability are known. A ten-acre wildfire occurred in 2010 after being accidently set. This is the only notable wildfire since the last HMP was adopted.

9.2 Existing Programs, Policies, and Mitigation Measures

As previously noted, Montville is commencing a public safety study to review procedures and evaluate what works and does not work for the Town. Monitoring of potential fire conditions is another important part of mitigation. The Connecticut DEEP Forestry Division uses the rainfall data recorded by the Automated Flood Warning system to compile forest fire probability forecasts. This allows the DEEP to monitor drier areas to be prepared for forest fire conditions. The town can access this information over the internet. The town also receives "Red Flag" warnings via local media outlets.

Existing mitigation for wildland fire control is typically focused on building codes, public education, Fire Company training, and maintaining an adequate supply of equipment. Each Fire Company has a variety of equipment and the companies support one another throughout Town. Montville requires a development to install either a dry hydrant, a 10,000 gallon water tank or a fire pond if it is greater than 1,500 feet from the public water system. Town Officials would like to encourage extension of water mains into developed areas that are not currently served.

9.3 Vulnerabilities and Risk Assessment

Fire protection water is obtained through dry hydrants wherever possible and either 10,000 gallon water tanks or fire ponds wherever dry hydrants are not available. Pump trucks are relied upon to carry water to distant areas. The amount of fire protection afforded by the dry hydrants, water tanks, fire ponds and pump trucks is considered to be adequate for the development level of Montville. The Fire Companies will continue to evaluate the level of risk and the need for additional hydrants as development continues in the future.

Forests and inaccessible tracks of land are at the highest risk for wildfires. However, according to Town Officials, there are no specific areas of wildfire risk or vulnerability in Montville. Refer to Figure 9-1 in the Multi-Jurisdictional HMP for a general depiction of wildfire risk areas region-wide.

9.4 Potential Mitigation Measures, Strategies, and Alternatives

Based on the historic record and open space in town, Montville is a moderate risk area for wildfires. Potential mitigation measures for wildfires include a combination of prevention, education, and emergency planning measures as presented in Section 11.

10.0 DAM FAILURE

10.1 Setting / Historic Record

Dam failures can be triggered suddenly with little or no warning and often in connection with natural disasters such as floods and earthquakes. Dam failures can occur during flooding when the dam breaks under the additional force of floodwaters. In addition, a dam failure can cause a chain reaction where the sudden release of floodwaters causes the next dam downstream to fail. While flooding from a dam failure generally has a limited geographic extent, the effects are potentially catastrophic depending on the downstream population.

A dam failure affecting Montville is considered a possible event each year with potentially devastating effects. The Rockland Pond Dam nearly overtopped during the storms of March 2010, and the section of Montville downstream of the Rockland Pond Dam was evacuated when it became possible that the dam would breach. Repairs were recently made to this dam. Additionally, the Oxoboxo Lake Dam owned by Stone Container was grouted and repaired recently. Despite these incidents and repairs, no dam failures affected the town since the time of the last HMP.

10.2 Existing Programs, Policies, and Mitigation Measures

The Connecticut DEEP administers the Dam Safety Section and designates a classification to each state-registered dam based on its potential hazard as detailed in the regional plan. As noted in the Multi-Jurisdictional HMP, Montville is home to seven Class B (significant hazard) dams. These dams are listed in Table 10-1. No Class C (high hazard) dams are located within Montville. No Class B or Class C dams are located upstream of Montville whose failure could potentially lead to flooding within the Town.

TABLE 10-1
Dams Registered With the DEEP in the Town of Montville

Number	Name	Owner	Class
8601	Congdon Pond	Private (Commercial	B
8602	Bogue Brook Reservoir	City of New London	B
8606	Oxoboxo Lake	Private (Commercial)	B
8607	Wheeler Pond	Private	B
8610	Red Mill Pond	Private (Commercial)	B
8613	Rockland Pond	Private (Commercial)	B
8616	Stony Brook Reservoir	Norwich Public Utilities	B

Dams in the region whose failure could impact Montville are under the jurisdiction of the Connecticut DEEP. The dam safety statutes are codified in Section 22a-401 through 22a-411 inclusive of the Connecticut General Statutes. Sections 22a-409-1 and 22a-409-2 of the Regulations of Connecticut State Agencies have been enacted, which govern the registration, classification, and inspection of dams. Dams must be registered by the owner with the DEEP according to Connecticut Public Act 83-38.

Owners of high and significant hazard dams are required to maintain EOPs for such dams. The Town of Montville does not own any dams. Some of the EOPs for the seven Class B dams were on file at DEEP when conducting a Dam Safety file review. The dam failure inundation area for the Stony Brook Reservoir Dam and the area described in some detail below are shown on Figure 10-1. This information was additionally on file at the DEEP.

EOPs are on file with the Montville Emergency Management Director for the Oxoboxo/Stone Container dam, Rand Whitney, and Stony Brook Reservoir. During the March 2010 flood, the DEEP reportedly notified the Town to "follow the EOPs" on file as necessary. The Town should continue working with the DEEP and dam owners to ensure that all EOPs remain current and on file.

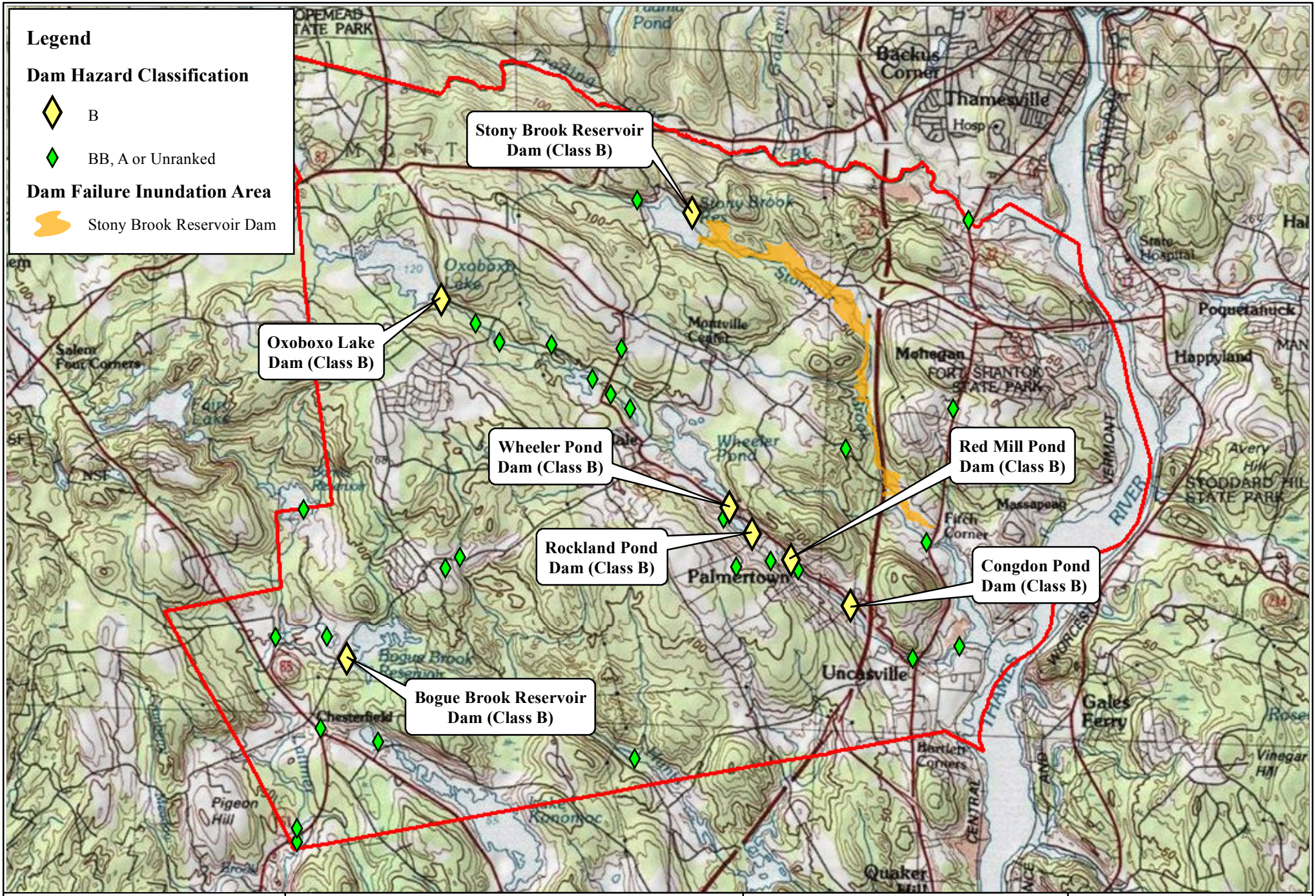
10.3 Vulnerabilities and Risk Assessment

The potential impacts related to the failure of Class B dams within Montville are described below. The descriptions below are based on information available at the Connecticut DEEP Dam Safety Section. Refer to Figure 10-1 for a location map showing the dams and potential dam failure inundation areas (where available).

- Congdon Pond Dam is a Class B dam located on Oxoboxo Brook. The dam has a stone masonry overflow spillway and two earth embankment sections. Earth embankment sections are approximately 35 feet high and are faced with stone masonry on both upstream and downstream sides with the facing nearly vertical. The crest is variable in width with the right embankment higher than the left. The total length of the dam is 150 feet including the spillway which is 50 feet in length.

  Although dam failure inundation area mapping was not found during the review of DEEP Dam Safety Section records, it was described in text. Failure to the dam could result in the loss of life and damage to seven to 10 dwellings and one to three commercial properties. Flooding and potential damage may also occur to Darrow Road as well as public utilities within the right-of-way. Damage may also occur to a double-barreled concrete arch bridge located 260 feet downstream of the dam and the failure will likely cause high velocity flows that will carry trees, vegetation and other debris that will increase damage potential. In August of 2001, an inspection noted that the dam was in "fair" condition.

- Bogue Brook Reservoir Dam is a Class B dam located at the west end of the Bogue Brook Reservoir, approximately 950 feet upstream of the Chesterfield Road crossing of Bogue Brook. A letter dated January 15, 2003 (from Karl Acimovic on behalf of the owner) to the CT DEEP states that the dam is an Ambursen design consisting of a thin-shell concrete structure buttressed by intermittent vertical panels. The letter also notes that the dam is currently stable and in relatively fair to good condition and that seepage at several points and hairline fractures make it look worse. According to the USACE inspection report online, the dam was completed in 1920 and the reservoir is used for water supply. The dam is a concrete structure with a length of 200 feet and a height of 22 feet. The drainage area to the reservoir is 1.7 square miles with the maximum storage being 684 acre-feet and the maximum discharge being 513 cubic feet per second (cfs). The dam failure inundation area mapping was not found on record.



SOURCE(S):
FEMA, USGS Topographic Map (ESRI)

N

Figure 10-1: High and Significant Hazard Dams in the Town of Montville

Title of Project

LOCATION:
Montville, CT

Map By: SMG
MMI#: 3570-05
MXD: H:\3570-05\GIS\Maps\Montville\Figure 10-1.mxd
1st Revision: 7/7/2012
Revision: 7/19/2012
Scale: 1 in = 8,000 ft

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- Oxoboxo Lake Dam is a Class B dam located on Oxoboxo Brook at the southeast end of Oxoboxo Lake. According to the USACE inspection report online, the dam was completed in 1810, has a length of 166 feet, and a height of 26 feet. The drainage area to the lake is 3.29 square miles, the maximum storage is 2,573 acre-feet, and the maximum discharge is 400 cfs. The lake is used for recreation. The dam failure inundation mapping was not found on record at the DEEP.

- Wheeler Pond Dam is a Class B dam located on Oxoboxo Brook at the southeast end of Wheeler Pond. According to the USACE inspection report online, the dam was completed in 1810 and is a concrete structure with a length of 54 feet and a height of 20 feet. The drainage area to the pond is 9.09 square miles and the maximum storage is 1,276 acre-feet, while the maximum discharge is 934 cfs. The report does not specify the purpose of the dam and impoundment. The dam failure inundation mapping was not found on record at the DEEP.

- Red Mill Pond Dam is a Class B dam located on Oxoboxo Brook at the southeast end of Red Mill Pond. No files, including dam failure inundation mapping, were found on record at the DEEP.

- Rockland Pond Dam is a Class B dam located on Oxoboxo Brook at the southeast end of Rockland Pond. According to the USACE inspection report online, the dam was completed in 1900, has a length of 133 feet, and a height of 10 feet. The drainage area to the pond is 9.7 square miles, the maximum storage is 92 acre-feet and the maximum discharge is 870 cfs. The report does not specify the purpose of the dam and impoundment. Dam failure inundation mapping was not found on record at the DEEP.

- Stony Brook Reservoir Dam is a Class B dam located on Stony Brook. The most recent dam inspection was completed by Milone & MacBroom, Inc. in 2009, and the EOP was developed by Milone & MacBroom, Inc. the same year. The Stony Brook dam consists of a main earthen embankment dam on the right side of the impoundment and a second earthen dam with concrete spillway on the left side of the impoundment. The main dam earthen embankment was in good condition. The downstream face of the embankment has very steep side slopes. The embankment is covered with light vegetation that is mowed on a regular basis. Riprap has been placed along the downstream toe. The upstream face is entirely rip rapped. A gate house is located off the upstream face of the embankment near the left side of the impoundment. The spillway was in very good condition. It is comprised of concrete training walls, a concrete floor, and a single concrete pier supporting a timber bridge that passes over the spillway. The spillway is outfitted with an inflatable rubber dam in very good condition.

10.4 Potential Mitigation Measures, Strategies, and Alternatives

Based on the historic record and the presence of several Class B dams, Montville is considered a moderate risk area for dam failure damage. However, there is evidence of active coordination between the Town, the owners of the different dams, and DEEP. This indicates that risks may be reduced. Potential mitigation measures for dam failure include a combination of prevention, education, and emergency planning, as well as dam removal projects as discussed in Section 11.

11.0 RECOMMENDATIONS

11.1 Summary of Specific Recommendations

The Multi-Jurisdictional HMP provided several region-wide recommendations applicable to all hazards that are also pertinent to Montville. In addition, recommendations throughout the sections of this annex are also applicable as recommendations. These recommendations are listed below.

11.1.1 Recommendations Applicable to All Hazards

Regional Coordination

- Continue to promote inter-jurisdictional coordination efforts for emergency response.
- Continue to promote local and regional planning exercises that increase readiness to respond to disasters.
- Continue to evaluate communication capabilities and pursue upgrades to communication ensuring redundant layers of communication are in place within the town and with other SCCOG communities, New London County, and the State of Connecticut.
- Continue to promote regional transportation planning through SCCOG to balance general transportation, shipping, and potential evacuation needs.
- Work with SCCOG to perform a regional study to identify the vulnerability of critical facilities that may be unable to withstand natural hazard damage. Emphasis should be placed on critical infrastructure, shelters and other sites to ensure structural integrity against various hazards and adequacy of backup supplies.

Local Emergency Response

- Continue to review and update the town EOP at least once annually.
- Continue to maintain emergency response training and equipment and upgrade equipment when possible.
- Encourage local officials to attend FEMA-sponsored training seminars at the Emergency Management Institute (EMI) in Emmitsburg, Maryland. All of these workshops are free of charge. Tuition, travel and lodging are provided by FEMA for the EMI training. Annual training sessions include emergency management, environmental reviews, the FEMA grant programs, the NFIP and CRS and others related to other hazards.
- Continue to evaluate emergency shelters, update supplies and check communication equipment.
- Continue to promote dissemination of public information regarding natural hazard effects and mitigation measures into local governmental and community buildings. Specifically,

- ⇨ Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series (http://www.ready.gov/are-you-ready-guide).

- ⇨ Encourage residents to purchase NOAA weather radios with an alarm feature.

- ⇨ Post hazard preparedness information on the town's website. Include links to established sources at the State of Connecticut and FEMA.

Prevention

- ❑ Develop a checklist for land development applicants that cross-references the specific regulations and codes related to disaster resilience.

- ❑ Integrate elements of this HMP into the *Plan of Conservation and Development* next update and beyond.

- ❑ Consider requiring the underground installation of utilities for new development to the greatest extent/feasibility. Areas of shallow bedrock will likely be limiting.

- ❑ Continue reviewing building plans to ensure proper access for emergency vehicles.

- ❑ Continue to enforce the appropriate building code for new building projects.

- ❑ Encourage residents to install and maintain lightning rods on their buildings.

- ❑ Continue to advertise the sign up page for the CT Alert "Everbridge" Emergency Notification System for Reverse 9-1-1 on the Town web site and anywhere else the Town deems effective.

Natural Resource Protection & Open Space

- ❑ Continue to regulate development in protected and sensitive areas including steep slopes, wetlands, and floodplains.

Public Education and Awareness

- ❑ Conduct a "Natural Hazards Fair" so that interested parties can familiarize themselves with natural hazard mitigation options. Consider working different "hazard weeks" into public education plans when possible tying into national hazard weeks such as "Flood Mitigation Week", "Hurricane Preparedness Week", and others.

11.1.2 Recommendations Applicable to Inland and Coastal Flooding

Prevention

- ❑ Continue to regulate new development activities within SFHAs to the greatest extent possible within the local land use regulations.

- Require developers to demonstrate whether detention or retention of stormwater is the best option for reducing peak flows downstream.

- Conduct an annual inspection of floodprone areas that are accessible to town officials. Determine if potential flood damage is stormwater facility related and make recommendations as appropriate.

- Specific language regarding sea level rise should be reviewed when updating pertinent planning documents moving forward.

- Work with State and Federal agencies to ensure that flood protection regulations reflect current thinking and standards especially with regard to long-term rise in sea levels.

- Utilize the 2008 FEMA Hurricane Surge mapping to compile a list of addresses with structures within hurricane storm surge areas. Track the cost of repairs to these properties following major storm events through outreach or building permits to develop a database of information for potential future grant funding.

Property Protection

- Incorporate information on the availability of flood insurance into all hazard-related public education workshops.

- Make available FEMA-provided flood insurance brochures at public accessible places such as the local government buildings. Encourage residents to purchase flood insurance if they are located within a FEMA SFHA.

- Provide technical assistance to owners of non-residential structures that suffer flood damage regarding floodproofing measures such as wet and dry floodproofing.

- Encourage property owners to submit flood insurance claims following damage events. This is especially important for residents such as the owner of Faria Marine Instruments and at the Countryside Condominiums.

Emergency Services

- The Town should continuously monitor any flooding activity of the Chesterfield Fire Company which is located in the Zone AE Special Flood Hazard Area (SFHA) and the Montville Fire Company which is partially located in the 0.2 Percent Annual Chance floodplain. The Town may wish to identify floodproofing measures and pursue funding opportunities to give the Town the best chance for success at eliminating flooding hazard at each site.

- Pursue mutual aid agreements with such organizations as the American Red Cross and the Boy Scouts of America to provide volunteer labor during flooding to assist with response activities.

Public Education and Awareness

- Visit schools (as is currently done under fire prevention) and educate children about the risks of floods (and other natural hazards) and how to prepare for them.

- Encourage builders, developers, and architects to become familiar with the NFIP land use and building standards by attending annual workshops.

Natural Resource Protection

- Pursue the acquisition of additional municipal open space in SFHAs.

- Continue to aggressively pursue wetlands protection through existing wetlands regulations. Incorporate performance standards into subdivision reviews to include additional protective measures such as conservation easement areas around wetlands and watercourses.

Structural Projects

- Utilize recently available extreme rainfall data to determine existing sizing of culverts. Encourage bridge replacements and culvert replacements in areas found to be undersized. Web sites such as http://precip.eas.cornell.edu/ publish this information.

- Continue to perform catch basin and culvert surveys to perform maintenance and cleaning and to identify and prioritize structures in need of replacement.

- Continue to pursue funding to conduct drainage improvements to Route 32 South at Jerome Avenue. This is a recommendation carry-through from the 2005 Plan that has yet to be completed and remains valid.

- Complete the culvert replacement on Old Colchester Road near Fair Oaks. This is a recommendation carry-through from the 2005 Plan.

- Continue to pursue funding to replace the bridge on Pink Row near the Montville WPCF. This recommendation is a carry-through from the 2005 Plan as it has yet to be completed, but remains valid.

- Pursue funding to improve drainage along Laurel Point Drive near Oxoboxo Lake which floods annually.

- Pursue funding to evaluate the causes of flooding and improve drainage on the section of Maple Avenue near Town Hall which experiences annual roadway inundation.

- Improve the drainage system on Fitch Hill Road near the intersection with Old Fitch Hill Road.

- Work with the owner of Faria Marine Instruments to pursue funding for floodproofing which may include elevation, acquisition or some other floodproofing measure to eliminate repeated basement flooding.

- Work with the owners of Countryside Condominiums and pursue funding to investigate and resolve the drainage problem with drainage system upgrades to the contributing source in the area.

- Work with the owner of the Repetitive Loss Property on Lake Drive East to pursue funding for floodproofing which may include acquisition, elevation or some other measure to eliminate repeated basement flooding.

- The Town should look for opportunities to upgrade stormwater collection and discharge systems to keep up with rising sea level.

11.1.3 Recommendations Applicable to Wind Damage from Hurricanes, Tropical Storms, Summer Storms, Tornadoes, and Winter Storms

Prevention

- Encourage Connecticut Light & Power to also cut down trees as opposed to just trimming trees near power lines.

- Continue to perform appropriate tree maintenance to the greatest extent possible.

- High priority is given to improving communication between CL&P and the Town to limit the amount of time that residents and businesses lose power following a significant weather event such as the between seven days many experienced following Tropical Storm Irene.

Property Protection

- Promote the use of functional shutters for older buildings in the town to guard against window breakage which can result in structural failure.

- The Building Official should make information on wind-resistant construction techniques (such as hurricane straps) available to all building permit applicants.

- Encourage commercial building owners to develop Emergency Response Plans and identify mitigation opportunities.

Emergency Services

- Identify a location or locations in the town for a brush disposal operation for dealing with debris after wind storms. Determine how these trees can be reused within the town (chips, firewood, composting) to reduce costs of exporting.

- Consider surveying all town-owned buildings to determine their ability to withstand wind loading, particularly shelters and schools. Such effort could be included in the regional critical facility study described in Section 2.8.

- Develop agreements, if necessary, with land owners and with companies to chop/chip in order to ensure that plans are in place prior to damage and cleanup needs (as is done for snow plow operations).

Public Education and Awareness

- Visit schools (as is currently done under fire prevention) and educate children about the risks of wind events (and other natural hazards) and how to prepare for them.

11.1.4 Recommendations Exclusively Applicable to Winter Storms

- Give priority to important and high traffic volume roadways with steep slopes when Town staff begins their treatment of roads.

- Consider drafting a written plan for inspecting and prioritizing the removal of snow from town-owned structures.

- Continue making funding available to the Department of Public Works each budget year for clearing snow from roads and parking lots.

- Provide information for generally protecting Town residents during cold weather and for mitigating icing and insulating pipes at residences.

- Continue to identify areas that are difficult to access during winter storm events and develop contingency plans for emergency personnel.

11.1.5 Recommendations Applicable to Earthquakes

- Ensure that town departments have adequate backup supplies and facilities for continued functionality in case earthquake damage occurs to these buildings and critical facilities. This should be part of the regional critical facility study discussed in Section 2.8.

- Consider preventing residential development in areas prone to collapse such as below steep slopes or in areas underlain by stratified drift and prone to liquefaction.

11.1.6 Recommendations Applicable to Wildfires

- Work with water supply utilities to extend water mains into developed areas where not currently served.

- Continue to evaluate dry hydrants, fire ponds, fire water tanks, and areas at risk of wildfire in the Town if and when they develop.

- Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes from wildfires. Educational materials should be made available at the Town Hall.

- Ensure that provisions of town regulations regarding fire protection facilities and infrastructure are being enforced.

11.1.7 Recommendations Applicable to Dam Failure

- The Town should work with the DEEP and dam owners to ensure that all EOPs remain current and on file.

- Provide assistance to owners of lesser-ranked dams regarding resources available for inspections and maintenance. This includes seven additional registered dams within Montville according to the DEEP "1996 Dam Inventory" datalayer.

11.2 Prioritization of Specific Recommendations

As explained in Section 11.3 of the Multi-Jurisdictional HMP, the STAPLEE method was utilized in this annex to prioritize recommendations. Table 11-1 presents the STAPLEE matrix for the Town of Montville. Each recommendation includes the department or commission responsible for implementing the recommendation, a proposed schedule, and whether or not the recommendation is new or originally from the previous HMP. Refer also to Section 2.7 for the list of previous plan recommendations and whether or not each recommendation was carried forward into this HMP.

TABLE 11-1: TOWN OF MONTVILLE STAPLEE MATRIX FOR PRIORITIZING RECOMMENDATIONS

Implementation of Current Recommendations	Existing or New Recommendation?	Responsible Department[1]	Schedule	Cost[2]	Potential Funding Source[3]	Weighted STAPLEE Criteria[4]															Total STAPLEE Score
						Benefits								*Costs*							
						Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	
ALL HAZARDS																					
Regional Coordination																					
Continue to promote inter-jurisdictional coordination efforts for emergency response	New	TC, FC	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Continue to promote local and regional planning exercises that increase readiness to respond to disasters	New	TC, EM	2012-2017	Low	OB	1	1	1	1	1	0.5	1	**8.0**								**0.0**	***8.0***
Continue to evaluate communication capabilities and pursue upgrades to communication and ensure redundant equipment is available	Existing	MY, FC	2012-2017	Low	OB, CI	1	1	1	1	1	1	1	**9.0**						-0.5		**-1.0**	***8.0***
Continue to promote regional transportation planning through SCCOG	Existing	TC	2012-2017	Low	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
Work with the SCCOG to perform a regional study of the vulnerability of critical facilities to natural hazard damage	New	MY	2012-2017	Low	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
Local Emergency Response																					
Continue to review and update the town EOP at least once annually	Existing	TC, FC	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Continue to maintain emergency response training and equipment and upgrade equipment when possible	Existing	TC, FC	2012-2017	Moderate	OB, CI	1	1	1	1	1	0.5	1	**8.0**						-0.5		**-1.0**	***7.0***
Encourage town officials to attend FEMA-sponsored training seminars at EMI	New	MY	2012-2017	Minimal	OB	0.5	0.5	1	1	1	1	0.5	**7.0**								**0.0**	***7.0***
Continue to evaluate emergency shelters, update supplies, and check communication equipment	Existing	MY, FC	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Continue to promote dissemination of public information regarding natural hazard effects into local government and community buildings	Existing	MY, PL	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Prevention																					
Develop a checklist for land development applicants that cross-references the specific regulations and codes related to disaster resilience	New	PL	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**			-0.5					**-0.5**	***7.5***
Integrate elements of this HMP into the next update of the Plan of Conservation and Development and beyond	New	PZ, PL	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**			-1	-0.5				**-1.5**	***7.5***
Consider requiring underground installation of utilities for new development to the greatest extent/feasibility	New	PZ	2012-2017	Minimal	OB	1	1	1	1	1	0.5		**7.0**	-0.5			-0.5				**-1.0**	***6.0***
Continue reviewing building plans to ensure proper access for emergency vehicles	New	FC	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Continue to enforce the appropriate building code for new building projects	New	PL	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Encourage residents to install and maintain lightning rods on their structures	New	FC, PL	2012-2017	Minimal	OB	1	0.5	1	1	1	1	0.5	**7.5**								**0.0**	***7.5***
Continue to advertise the sign up page for the CT Alert "Everbridge" Emergency Notification System for reverse 9-1-1	Existing	MY	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**			-1					**-1.0**	***7.0***
Natural Resource Protection & Open Space																					
Continue to regulate development in protected and sensitive areas including steep slopes, wetlands, and floodplains	New	PZ	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Public Education and Awareness																					
Conduct a "Natural Hazards Fair" and consider working different "Hazard Weeks" into the town's public education program	New	MY, FC	2012-2017	Moderate	OB	1	1	0.5	0.5	1	1		**7.0**			-0.5	-0.5				**-1.0**	***6.0***
INLAND & COASTAL FLOODING																					
Prevention																					
Continue to regulate new development activities within SFHAs to the greatest extent possible within town land use regulations	New	PZ	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**								**0.0**	***9.0***
Require developers to demonstrate whether detention or retention of stormwater is the best option for reducing peak flows downstream	New	PZ	2012-2017	Minimal	OB	0.5	1	1	1	1	1	0.5	**8.0**								**0.0**	***8.0***
Conduct an annual inspection of floodprone areas that are publically accessible and recommend drainage improvements as appropriate	New	PW	2012-2017	Low	OB	1	1	1	0.5	1	0.5	0.5	**7.0**								**0.0**	***7.0***
Specific language regarding sea level rise should be reviewed when updating planning documents	New	PW	2012-2018	Low	OB	1	1	1	0.5	1	0.5	0.5	**7.0**								**0.0**	***7.0***
Work with State and Federal agencies to ensure flood protection regulations reflect current practices regarding sea level rise	New	PW	2012-2019	Low	OB	1	1	1	0.5	1	0.5	0.5	**7.0**								**0.0**	***7.0***
Utilize the 2008 FEMA Hurricane Surge mapping to compile a list of addresses with structures within the Hurricane Surge Areas	New	PW	2012-2020	Low	OB	1	1	1	0.5	1	0.5	0.5	**7.0**								**0.0**	***7.0***
Property Protection																					
Incorporate information on the availability of flood insurance into all hazard-related public education workshops	New	PL, MY	2012-2017	Low	OB	1	1	0.5	0.5	1	1		**7.0**	-0.5							**-0.5**	***6.5***
Make available FEMA-provided flood insurance brochures and encourage residents to purchase insurance if they are in a SFHA	New	PL, MY	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Provide technical assistance to owners of non-residential structures that suffer flood damage regarding flooding measures	New	MY, FC	2012-2017	Low	OB	1	0.5	0.5	1	1	1	0.5	**7.0**								**0.0**	***7.0***
Encourage residents to submit flood insurance claims following damage events especially Faria Marine Inst. & the Countryside Condominiums	New	All	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Emergency Services																					
Continuously monitor Chesterfield Fire Company and Montville Fire Company for any future floodproofing needs which may include relocation	New	MY, FC	2012-2016	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Pursue mutual aid agreements with non-profits to provide volunteer labor for response activities	New	MY, FC	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***

TABLE 11-1: TOWN OF MONTVILLE STAPLEE MATRIX FOR PRIORITIZING RECOMMENDATIONS

Implementation of Current Recommendations	Existing or New Recommendation?	Responsible Department[1]	Schedule	Cost[2]	Potential Funding Source[3]	Weighted STAPLEE Criteria[4]															Total STAPLEE Score
						Benefits								*Costs*							
						Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	
Public Education and Awareness																					
Visit schools and educate children about the risks of flooding and how to prepare	New	FC	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Encourage builders, developers, and architects to become familiar with NFIP land use and building standards at annual workshops	New	PL, PLO	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**			-0.5					**-0.5**	***7.5***
Natural Resource Protection																					
Pursue the acquisition of additional municipal open space in SFHAs	New	TC	2012-2017	High	OB	1	1	1	1	1	1	1	**9.0**						-1		**-2.0**	***7.0***
Continue to aggressively pursue wetlands protection and incorporate performance standards into subdivision reviews	New	PZ	2012-2017	Low	OB	1	1	1	1	1	1	1	**9.0**	-0.5		-0.5					**-1.0**	***8.0***
Structural Projects																					
Utilize the recently available extreme rainfall data to determine existing culvert sizing and encourage upgrades where undersized	New	PW	2012-2017	Moderate	CI	0.5	1	1	0.5	1	1		**7.0**						-1		**-2.0**	***5.0***
Continue to perform catch basin and culvert surveys to prioritize upgrades and perform maintenance and cleaning	Existing	PW	2012-2017	Moderate	OB	1	1	1	1	1	0.5	0.5	**7.5**								**0.0**	***7.5***
Continue to pursue funding to conduct drainage improvements to Route 32 South at Jerome Avenue	Existing	PW, TC	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Complete the culvert replacement on Old Colchester Road near Fair Oaks with HMGP funding	Existing	PW, TC	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Continue to pursue funding to replace the bridge on Pink Row near the Montville WPCF	Existing	PW, TC	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Pursue funding to improve drainage along Laurel Point Drive near Oxoboxo Lake	New	PW, TC	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Pursue funding to improve drainage and investigate a connection with Route 163 road work to the section of Maple Ave. near Town Hall	New	PW, MY	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Pursue funding to improve the drainage system on Fitch Hill Road near the intersection with Old Fitch Hill Road	New	PW, MY	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Work with the owner of Faria Marine Instruments to report all flood damage and consider pursuing funding for floodproofing	New	PW, MY	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Work with the owners of Countryside Condominiums to report all flood damage and consider pursuing funding for floodproofing	New	PW, MY	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Work with the owner of the Repetitive Loss Property on Lake Drive East to pursue funding for floodproofing	New	PW, MY	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
Look for opportunities and subsequently pursue funding to upgrade stormwater collection and discharge systems per sea level rise	New	PW, MY	2012-2017	High	CI	1	1	1	1	1	1		**8.0**		-0.5				-0.5		**-2.0**	***6.0***
WIND DAMAGE FROM HURRICANES, TROPICAL STORMS, SUMMER STORMS, TORNADOES, AND WINTER STORMS																					
Prevention																					
Encourage CL&P to also cut down trees as opposed to just trimming trees near their power lines	New	MY	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**							-0.5	**-0.5**	***8.5***
Continue to perform appropriate tree maintenance to the greatest extent possible	Existing	PW	2012-2017	Minimal	OB	1	1	1	1	1	1	1	**9.0**							-0.5	**-0.5**	***8.5***
Property Protection																					
Improve communications to prevent a future long, extended outage such as the one experienced following Tropical Storm Irene	New	MY, FC	2012-2016	Minimal	OB, CI	1	0.5	1	1	1	0.5		**6.0**								**0.0**	***6.0***
Promote the use of functional shutters for older buildings in the town and investigate funding sources	New	PL, PZ	2012-2017	Minimal	OB, CI	1	0.5	1	1	1	0.5		**6.0**								**0.0**	***6.0***
Make information on wind-resistant construction techniques available to all building permit applicants	New	PL, PZ	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Encourage commercial building owners to develop emergency response plans and identify mitigation opportunities	New	PL, FC	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Emergency Services																					
Identify a location(s) for a brush disposal operation for dealing with debris following wind storms and determine potential reuse	New	PW	2012-2017	Minimal	CI	0.5	1	1	1	1	1		**7.5**								**0.0**	***7.5***
Consider surveying all town-owned buildings to determine their ability to withstand wind loading giving priority to the oldest buildings	New	PL, BD	2012-2017	Low	OB	1	0.5	1	0.5	1	0.5		**5.5**								**0.0**	***5.5***
Develop agreements with landowners and companies to chop/chip to ensure backup plans are in place for debris removal	New	PW, MY	2012-2017	Low	OB	0.5	0.5	1	0.5	1	0.5		**5.0**								**0.0**	***5.0***
Public Education and Awareness																					
Visit schools and educate children about the risks of wind events and how to prepare for them	New	FC	2012-2017	Low	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
WINTER STORMS																					
Give priority to important and high traffic volume roadways with steep slopes when Town staff begins treatment of roads	New	PW	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**	-0.5						-0.5	**-1.0**	***7.0***
Consider drafting a written plan for inspecting and prioritizing the removal of snow from town-owned structures	New	PL, MY	2012-2017	Low	OB	0.5	1	1	1	1	0.5		**6.5**								**0.0**	***6.5***
Continue making funding available to the Public Works Department each year for clearing snow from roads and parking lots	New	TC	2012-2017	High	OB	1	1	1	1	1	0.5		**7.0**								**0.0**	***7.0***
Provide information for protecting Town residents during cold weather and for mitigating icing and insulating pipes at residences	New	PL	2012-2017	Low	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***
Continue to identify areas that are difficult to access during winter storm events and develop contingency plans to access such areas	New	FC, PW	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**								**0.0**	***8.0***

TABLE 11-1: TOWN OF MONTVILLE STAPLEE MATRIX FOR PRIORITIZING RECOMMENDATIONS

Implementation of Current Recommendations	Existing or New Recommendation?	Responsible Department[1]	Schedule	Cost[2]	Potential Funding Source[3]	Weighted STAPLEE Criteria[4]															Total STAPLEE Score
						Benefits								*Costs*							
						Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	
EARTHQUAKES																					
Ensure that town departments have adequate backup supplies and facilities for continued functionality following an earthquake	New	TC	2012-2017	Moderate	OB, CI		0.5	1	0.5	0.5			**3.0**		-0.5		-1				**-2.0**	***1.0***
Consider preventing residential development in areas prone to collapse such as below steep slopes or areas prone to liquefaction	New	PZ	2012-2017	Minimal	OB	0.5	1	1	0.5	0.5	1	0.5	**7.0**				-0.5				**-0.5**	***6.5***
WILDFIRES																					
Work with water supply utilities to extend water mains into developed areas not currently served	New	FC, MY	2012-2017	High	CI	1	1	1	1	1	1	0.5	**8.5**			-0.5			-1		**-2.5**	***6.0***
Continue to evaluate fire flows, available water supply, and areas at risk of wildfire in the town if/when they develop	New	FC	2012-2017	Minimal	OB	1	1	1	1	1	1	0.5	**8.5**								**0.0**	***8.5***
Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes	New	FC	2012-2017	Low	OB	1	1	1	1	1	0.5	1	**8.0**								**0.0**	***8.0***
Ensure that provisions of town regulations regarding fire protection facilities and infrastructure are being enforced	New	PD	2012-2017	Low	OB	0.5	0.5	1	0.5	1	0.5		**5.0**								**0.0**	***5.0***
DAM FAILURE																					
Work with the CT DEEP Dam Safety Section and dam owners to ensure that all EOPs remain current and on file	New	MY	2012-2017	Minimal	OB	1	1	1	1	1	1		**8.0**			-0.5					**-0.5**	***7.5***
Provide assistance to the owners of lesser ranked dams regarding resources available for inspections and maintenance	New	PL	2012-2017	Minimal	OB	0.5	0.5	0.5	0.5	1		0.5	**4.0**								**0.0**	***4.0***

NOTES

1. Departments:
   TC = Town Council
   MY = Mayor
   FC = Fire Companies (Montville, Mohegan, Oakdale and Chesterfield)
   PW = Public Works Department
   PL = Planning & Zoning Department
   PZ = Planning & Zoning Commission
   BD = Building Department
2. Minimal = To be completed by staff or volunteers where costs are primarily printing, copying, or meetings; Low = Costs are less than $10,000; Moderate = Costs are less than $100,000; High = Costs are > than $100,000.
3. OB = Operating Budget; CI = Capital Improvement budget; a * indicates that grant funding is needed and will be pursued
4. A beneficial or favorable rating = 1; an unfavorable rating = -1. Technical and Financial benefits and costs are double-weighted (i.e. their values are counted twice in each subtotal)

APPENDIX A

ADOPTION RESOLUTION

TOWN OF MONTVILLE
Office of the Town Clerk
(860) 848-3030

310 Norwich-New London Tpke.
Uncasville, CT 06382

lterry@montville-ct.org
www.townofmontville.org

RESOLUTION NO. 2012-89

State of Connecticut

Montville December 6, 2012

County of New London

I Lisa Terry, Town Clerk of Montville do hereby certify that the following is a true and correct copy of a resolution adopted at a regular meeting of the Town Council duly held and convened on the 14th day of November 2012, at which a constituted quorum of the Town Council was present and acting throughout, and further certify that's such resolution has not been modified, rescinded, or revoked, and is, at present, in full force and effect.

THE TOWN OF MONTVILLE HEREBY RESOLVES to Consider and act on a Resolution to adopt the Hazard Mitigation Plan Update for the Town of Montville.

IN WITNESS WHEREOF, the undersigned affixed her signature and the town seal this 6th day of December, 2012.

Lisa Terry

Lisa Terry, Montville Town Clerk