HAZARD MITIGATION PLAN
ANNEX
FOR
EAST LYME, CONNECTICUT

An Annex of the
Southeastern Connecticut
Regional Hazard Mitigation Plan

PREPARED FOR:

Southeastern Connecticut
Council of Governments

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I. INTRODUCTION

A. Setting

The Town of East Lyme is a suburban residential community, approximately 34.8 square miles in area, located on the north shore of Long Island Sound. East Lyme is bordered by the Town of Salem on the north, by the Town of Montville on the northeast, the Town of Lyme on the northwest, the Town of Waterford on the southeast, and the Town of Old Lyme on the southwest.

Its location with numerous shoreline beaches, has made East Lyme a popular summer community. The population of East Lyme is 18,188 according to the 2000 U.S. Census. East Lyme is moderately developed with commercial structures along Route 1 and Route 161 near Interstate 95. Route 161 and Route 156 in Niantic are also developed with restaurants and shops near the shoreline. Two medical centers, Charter Oak Walk-In and Flanders Health are available to residents. East Lyme is accessible via Interstate 95, Route 1, Route 156, Route 161, and the Providence/Worcester Rail line.

East Lyme has a significant area of land that is public property. Rocky Neck State Park, occupies approximately one-third of East Lyme's Long Island Sound shoreline. Rocky Neck State Park is a popular tourist attraction for camping and swimming during the summer. Other public properties in East Lyme include the Stone Ranch Military Camp, Nehantic State Forest, and the State Correctional Center for Women.

The Niantic River borders East Lyme to the east and attracts recreational boaters during the summer months. Other bodies of water in East Lyme include Powers Lake, Darrow Pond, Pattagansett Lake, Gorton Pond, Dodge Pond, and Bride Lake.

B. Purpose of Annex

The purpose of this annex is to provide hazard risk assessment, capability assessment, hazard mitigation measures, and a hazard mitigation project ranking for the Town of East Lyme. Hazards such as earthquakes and windstorms which affect the entire region are addressed in the Southeastern Connecticut Council of Governments Regional Hazard Mitigation Plan.

C. Plan Development Process and Public Involvement

The Regional Hazard Mitigation Plan and this annex were developed through a series of meetings and the completion of written questionnaires, personal interviews, and workshops. To provide oversight of the plan development process and maximize local involvement, all member communities in the region and the two tribal affiliate members were invited to appoint a representative to serve on the Hazard Mitigation Steering Committee. Committee members and chief elected officials received notices of all the committee meetings and were encouraged to attend. Meeting notices and agendas were also sent to area media and to town and city clerks for posting in each community. Steering committee meetings were held in public at the Southeastern Connecticut Council of Governments office in Norwich. Three steering committee meetings were held during the development of the hazard mitigation plan. Verbal reports on progress were given to monthly meetings of the Southeastern Connecticut Council of Governments. Articles describing the planning process have appeared in the three issues of the SCCOG Quarterly Newsletter since March, 2003. This newsletter is mailed to 285 officials, organizations, and media within the region.

II. HAZARD RISK ASSESSMENT

A meeting was held with community officials on August 25, 2003 to develop a community risk assessment for East Lyme. Based on the results of this meeting and additional risk assessment research it was determined that a significant natural hazard in East Lyme is flooding.

Several rivers and brooks flow throughout the town to Long Island Sound. The Niantic River, is a large tidal river, forming East Lyme's eastern corporate limits. A significant number of residential and commercial structures are located along the Pattagansett River, Latimer Brook, the Niantic River, and the Fourmile River. Gorton and Dodge Ponds and Pattagansett Lake also have a significant number of residential structures located along their shorelines.

The most severe flooding in East Lyme occurs during hurricanes or coastal storms. These storms, with their intense winds and rainfall, can create abnormally high tidal surges, wave runup, and stormwater runoff. When the hurricane's track is west of the community, the hurricane's counterclockwise winds tend to increase the adverse effect of the tidal surge. When coastal storms occur in winter and spring, the flooding problem can be compounded by runoff from melting snow.

The Town of East Lyme has a total tidal shoreline of 8.6 miles, 5.0 miles on Long Island Sound, and 3.6 miles on Niantic Bay and the Niantic River. The low-lying tidal shoreline areas of the town are subjected to periodic flooding by severe storms. The shoreline along the Sound, with its high concentration of residential structures, is highly susceptible to damage. The hurricanes of 1938 and 1954 caused substantial damage to East Lyme's shoreline developments.

In 1982, a major riverine flood damaged bridges and structures in the surrounding area. The event is the highest on record at the U.S. Geological Survey (USGS) gaging station on the Fourmile River.

According to the U.S. Army Corps of Engineers, damages from the 1938 and 1954 hurricanes were scattered along almost all of the shoreline, with the greatest concentration located along the west shore of Niantic Bay, from Black Point Beach Club to Crescent Beach. At the time, consideration was given to providing protection of the flooded area in the vicinity of Oak Beach. The plan consisted of placement of sand fill and diking along the shore with necessary tieback dikes to high ground. However, FEMA records indicate that no construction work on such a project was undertaken.

A dam is located at the outlet from Gorton Pond. Design and construction of repairs to the dam were directed by the State of Connecticut Department of Environmental Protection (DEP). An emergency control gate regulates the storage behind the dam and the discharge over the dam.

Buildings located in flood hazard areas are primarily residential. Most of the structures that are threatened by flooding are located within the 100-year floodplain, but some are also in the coastal velocity zone. Location in the velocity zone poses an increased threat to structures due to high wind and potential wave damage, as well as inundation by flood waters.

The Town of East Lyme has no formalized program currently in place to identify the location or the number of structures that are susceptible to flooding. Such information would be valuable in directing hazard mitigation efforts to locations with the greatest risk. A potential hazard mitigation project would involve the review of all existing available data regarding flood hazards and the preparation of an inventory and assessment of structures at risk in the flood hazard areas.

Such an inventory program would be the first step in completing a Flood Audit which would provide early flood warning, guidance and technical information regarding flood risks to property owners, as well as prioritize future property protection projects. The completion of a Flood Audit would be an important step in the National Flood Insurance Programs Community Rating System by which towns can qualify for a reduction in flood insurance rates.

A. Residential

Based on review of the Town of East Lyme's Flood Insurance Rate Maps and topographic maps, residential structures that are subject to flooding during significant flood events are located along the shoreline and are impacted by coastal flooding.

Several concentrations of residential development exist along the shorelines of Long Island Sound, Niantic Bay, and the Niantic River. The vast majority of structures are residential, although a few commercial structures are located along these shorelines.

Tidal flooding occurs along Shore Drive, Shore Road, and Atlantic Street, just off Niantic Bay. Also, tidal flooding has been reported on both the east and west shores of Black Point. Flooding at Giants Neck Road because of Bride Brook overflowing its banks has been reported. Riverine flooding, not directly related to tidal surges, has also occurred in East Lyme. Structures located in the riverine floodplain, such as Fourmile River and Latimer Brook have sustained flood damages.

Repetitive flood insurance claims have been filed at three properties in East Lyme.

The Town of East Lyme has several areas throughout the town with the potential to flood during severe storms, damage structures, and impede vehicle travel during emergencies. These areas are situated along Latimer Brook, the Pattagansett River, and the shoreline which includes the Niantic River, Niantic Bay, Long Island Sound, and the Fourmile River.

Latimer Brook flows north to south and empties at the confluence of the Niantic River. Colony Road and a section of Route 1 are susceptible to roadway flooding from Latimer Brook. A review of FEMA flood data suggests that the brook could overtop the road at these locations potentially making it impassable. There are several residential neighborhoods in the area of Colony Road with several structures in flood zones. Cavasin Road and Latimer Drive could be flooded by Latimer Brook. Several residential developments could be affected by flooding as Colony Road is the only access roadway to the neighborhoods.

The Pattagansett River is a large river that flows through the town from north to south. Several roads have the potential to flood during severe storms including Route 1 (Boston Post Road), Industrial Park Road, Roxbury Road, Bush Hill Drive, Route 156 (West Main Street), and Fairhaven Road. Residential structures located in the vicinity of the Pattagansett River are potentially in danger of damage from flooding. There are also several neighborhoods with structures located in the flood zone of the Pattagansett River which include Huntley Court, McElaney Drive, and Herester Drive. Several bridges extend across the Pattagansett River and could be potentially flooded during severe storms.

There are several roadways and structures in potential flood areas. Shore Avenue and Bishop Bay Road are located near the Niantic River and are impacted by tidal flooding. Several structures in the area around Saunders Point and Pine Grove are also susceptible to flooding. Niantic Bay impacts several roads and structures in the area of Shore Road, West Road, Beach Avenue, and the eastern ends of Goodwin Street and Rockwell Street. Long Island Sound has the potential to impact several structures located along Atlantic Street, Hillside Avenue, Black Point Road, and Lake Shore Drive. A seawall protects the southern tip of Black Point and the eastern side of Black Point near the Black Point Beach Club from flooding, however, no other flood protection structures are located along the shoreline.

B. Commercial/Industrial

The majority of the town's commercial and industrial development are located along Routes 1, 161, and 156. Other commercial and industrial developments are scattered throughout East Lyme. Based on a review of the East Lyme Flood Insurance Rate Maps none of these major commercial and industrial developments are located in flood hazard areas.

C. Critical Facilities

A review of the Town of East Lyme's critical public facilities indicates these facilities are not located in flood hazard areas. These areas are free from flooding and are generally protected from other potential hazards.

D. Transportation Corridors

East Lyme has several major transportation routes including Interstate 95, Route 1, Route 156, and the Conrail/Amtrak rail line. A series of crossings of the railroad and the highway have been constructed to allow passage of roadways under and over the highway and railroad.

The potential for serious emergency response disruption exists as some of these crossings are in the flood zone. Close evaluation of the flooding impacts on the transportation system is important. Such an evaluation would focus on critical transportation corridors in terms of providing safe evacuation of low lying areas and those emergency response routes that are critical for use by emergency response personnel.

Several roadways may be potentially impacted by flooding such as Route 156 (West Main Street) at the Fourmile River, Brook Road at the Pantagansett River, Route 1 (Boston Post Road) at Latimer Brook, and Giants Neck Road near Rocky Neck State Park.

Town officials have also expressed concern with increased thru-traffic in East Lyme. Specifically, the town is concerned with the transportation of hazardous materials over their roadways and their ability to respond to a major incident regarding a release of such materials.

III. HAZARD MITIGATION MEASURES

The following sections provide a brief description of the types of hazard mitigation measures and programs that are available to address the natural hazards that exist in the town.

A. Prevention

Hazard prevention includes identification of risks and the use of land-use regulatory and other available management tools to prevent future damage. The Town of East Lyme has planning and zoning tools in place that incorporate floodplain management. The town's planning and zoning regulations, inland wetlands and watercourses regulations, and the building department's enforcement of the Connecticut Basic Building Code are all important existing regulatory mechanisms that address hazard prevention and incorporate flood management.

The following are examples of how hazard prevention can be accomplished through existing programs:

1. Planning and Zoning

   Planning and Zoning Regulations can be tailored to be consistent with hazard mitigation planning. Establishment of Flood Prone Conservancy Districts, Coastal Resource Zones, and River Corridor Preservation Zones are all techniques that can potentially be employed to limit additional development in hazardous locations.

2. Open Space Preservation

   Community Planning that includes open space acquisition and preservation sections can be established or revised in a manner that is consistent with hazard mitigation planning. Acquisition of floodplain and river corridor properties should be encouraged as a municipal priority.

3. Floodplain Development Regulations

The modification of floodplain management regulations to include more restrictive development standards is consistent with hazard mitigation planning. The National Flood Insurance Program Community Rating System gives credit to communities that exceed the minimum floodplain management requirements of the National Flood Insurance Program. Requirements include elevating structures higher than the 100-year base flood elevation, which is an example of a more stringent standard.

4. Stormwater Management

Stormwater management regulations that limit any potential increase of discharge of stormwater and that preserve floodplain storage are examples of the use of stormwater management in a manner consistent with hazard mitigation planning.

5. Wetlands Protection

Wetlands areas are generally also critical flood storage areas. By limiting wetlands development not only are important natural resource areas protected but additional floodplain development is also limited.

6. Erosion and Sediment Control Regulation

Effective implementation of sediment and erosion controls include utilization of detention basins and use of other Best Management Practices to slow the velocity and limit increase in runoff. Strict adherence to the requirements are effective hazard mitigation tools.

B. Property Protection

Property protection measures can address hazards at a single structure or can include multiple structures.

The following list identifies common property protection measures:

1. Relocation
2. Acquisition
3. Building Elevation
4. Utility Protection
5. Flood Proofing

Additional descriptions of property protection measures are provided in Appendix A in the Regional Hazard Mitigation Plan.

C. Emergency Services

Emergency communication is a critical aspect of the hazard response programs currently in place in East Lyme. Emergency Services hazard mitigation measures can be combined with other types of measures to form successful projects, or remain as stand-alone projects.

The major utilities that provide service to the town follow similar procedures. The Connecticut Light and Power Company has emergency operation centers which become operational in the event of any emergency that could impact the utilities.

The interagency communications between the town and the independent utilities requires continued coordination to assure the critical communications link between the town operations and the utilities is effectively maintained. A need for improved and continued coordination has been identified during this study.

Aspects of emergency services typically addressed in hazard mitigation include the following:

1. Emergency Communication
2. Flood Warning
3. Flood Response
4. Critical Facilities Protection

D. Structural Projects

Structural projects include utilization of the flood control strategies that have been and continue to be applied throughout Connecticut. The potential environmental impacts of structural projects are often a concern.

Structural projects that can be included in hazard mitigation planning include the following:

1. Levees/Floodwalls
2. Bridge & Culvert Replacement
3. Channel Modifications
4. Storm Sewer Improvements
5. Structural Project Maintenance and Repair

Any prospective projects which were identified during the course of assembling this plan are included in the hazard mitigation matrix in Appendix A of this annex report. Additional information on some types of structural projects is provided in Appendix A of the Regional Hazard Mitigation Plan.

E. Public Information

Public Information is another type of hazard mitigation measure which, like prevention and resource protection, can be most effectively implemented in conjunction with other hazard mitigation projects.

The Hazard Mitigation Committee has identified the need for a continued and expanded program of public information. Such a program could include providing educational information to the homeowners and business owners in the flood hazard areas. A public education and information component should be included in all hazard mitigation projects undertaken by the Town of East Lyme. The following list includes some common types of public information measures:

1. Map Information

   Development of hazard maps for public distribution or posting in public locations. This type of information is easily understood and assists in raising the public's awareness of the natural hazards that exist in their community.

2. Flood Audits

   For additional information regarding flood audits, refer to Appendix F of the Regional Hazard Mitigation Plan.

3. Real Estate Disclosure

   This is a procedure where buyers and sellers of real estate are compelled to provide notice of known hazards affecting the property to be conveyed.

4. Public Library

   Libraries can be an effective location of a hazard information center. Town Halls and other public facilities can also serve as information centers. A wide range of hazard mitigation documentation should be compiled for review.

5. Technical Assistance

Local governments can provide technical assistance to homeowners and contractors regarding hazard resistant construction. An appropriate time for such assistance can be at the time of a building permit application.

6. Environmental Education

Private and public schools and adult education programs can offer environmental education classes that include hazard identification and hazard mitigation components.

IV. HAZARD MITIGATION PROJECT RANKING

Based on the hazard risk assessment analysis, the Hazard Mitigation Committee has developed a matrix of several potential hazard mitigation projects recommended to reduce East Lyme's vulnerability to natural hazards. A matrix depicting potential hazard mitigation projects and a prioritized ranking is included in Appendix A.

Projects identified in the matrix have been prioritized based on the following criteria:

- Safety of the population
- Historical damage
- New development in high risk areas
- Value of property at risk
- Consistency with plan goals and objectives

The projects were also considered on how they relate to potential health risks, structural damage, access/egress for evacuation, and protection of structures that house people with special needs and residential areas housing a large portion of the town's population. For additional information on projects listed in the matrix and for a complete list of criteria used in the prioritization process, please refer to the text and attachments of the Regional Hazard Mitigation Plan.

V. IMPLEMENTATION, MONITORING, AND EVALUATION

The Southeastern Connecticut Council of Governments Regional Hazard Mitigation Plan and this associated community annex report were prepared with the understanding that potential funding sources may not be available within the time frame necessary to implement the recommended actions on a specific schedule. It is therefore necessary to incorporate into the plan a system of monitoring its progress and making necessary adjustments. In addition, the goals and objectives may need to be modified over time in order to meet the demands of a changing community. Accomplished activities will be eliminated, and new ones added.

The staff of the Southeastern Connecticut Council of Governments (SCCOG) serves as coordinator of the Hazard Mitigation Committee that provided oversight of the plan preparations. In accordance with § 201.6 (c)(4)(i) of the Interim Final Rule, it is recommended that the Committee meet on or before the fifth anniversary of the adoption of the plan to review the implementation progress as well as the goals, objectives, and actions outlined in the plan. With input from the Committee, SCCOG staff should prepare a report on the status of plan implementation. The report should include the following: a review of the goals and objectives of the original plan; a review of any disasters or hazards that occurred during the period; a review of each element or objective of the original plan, including what was accomplished the previous year; and recommendations for new projects or revised objectives.

FEMA also recommends that each of the local communities name a person as a local coordinator for the implementation and monitoring of the progress of the plan. This person would act as a contact for the Southeastern Connecticut Council of Governments and the State of Connecticut National Flood Insurance Program Coordinators during the grant application and cost-benefit analysis process.

The Town of East Lyme Hazard Mitigation Projects			
Hazard	**Vulnerable Location**	**Mitigation Project**	**Priority**
Flooding	Town Wide	Develop a Flood Audit Program	High
Flooding	Latimer Brook	Evaluate and Repair Undersized Channel Sections and Culverts	High
All Hazards	Town Wide	Evaluate the Hazard Resistant Nature of All Critical Facilities	High
All Hazards	Town Wide	Comprehensive Evaluation of Emergency Communication Capabilities Throughout Town	High
Flooding, Coastal Storms	Entire Shoreline	Inventory Evacuation Routes and Identify and Repair Impediments to Safe Access	Medium

The Town of East Lyme Hazard Mitigation Projects			
All Hazards	Town Wide	Review of TownTransportation Facilities to Identify Critical Risks	Medium
Hazard	**Vulnerable Location**	**Mitigation Project**	**Priority**
Hazardous Materials Spills on Roadways	State Roads	Identify Appropriate Improvements to Traffic Infrastructure and Emergency Response Training and Equipment	Medium
All Hazards	Town Wide	Implement a Reverse 9-1-1 System to Automatically Call Telephones Throughout Town, Relaying Important Information During an Emergency	Low
All Hazards	Town Wide	Distribute or Post Public Information Regarding Hazards in the Town	Low

The Town of East Lyme Hazard Mitigation Projects			
All Hazards	Town Wide	Evaluate Emergency Shelters, Update Supplies and Check Communication Equipment	Low
All Hazards	Town Wide	Maintain Emergency Personnel Training as well as Maintaining and Updating Emergency Equipment and Response Protocols	Low
Hazard	**Vulnerable Location**	**Mitigation Project**	**Priority**
Wind Hazards	Town Wide	Evaluate and Consider Burying Power Lines Underground and Away From Possible Tree Damage	Low
Earthquake Hazards	Town Wide	Complete an Earthquake Survey of all Critical Facilities and Infrastructures	Low

The Town of East Lyme Hazard Mitigation Projects			
Flooding	Town Wide	1)Complete Catch Basin Surveys to Identify Catch Basins in need of Maintenance and/or Replacement 2) Complete Culvert Survey to Determine Priority for Maintenance and/or Replacement Plan	Low
Fire Hazards	Town Wide	Complete a Survey of Fire Hydrants in the Town to Assess Vulnerabilities and Capabilities for Fire Protection Dry Hydrants should be Considered as a means for Emergency Equipment	Low
Hazard	**Vulnerable Location**	**Mitigation Project**	**Priority**

The Town of East Lyme Hazard Mitigation Projects			
Coastal Hazards	Coastal Areas	Improve Property Protection with Storm Shutters and when Possible Elevate Property above the Base Flood Elevation. Town should Consider Acquisition of Properties that are Repeatedly Flooded A Fireboat should be Considered as a Means of Emergency Equipment	Low