HAZARD MITIGATION PLAN UPDATE
ANNEX FOR THE TOWN OF GRISWOLD AND BOROUGH OF JEWETT CITY

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

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ADOPTED

MMI #3570-09

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TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION 1-1

1.1 Purpose of Annex 1-1
1.2 Setting 1-1
1.3 Plan Development 1-2
1.4 Progress Monitoring 1-3

2.0 COMMUNITY PROFILE 2-1

2.1 Physical Setting 2-1
2.2 Land Use and Development Trends 2-2
2.3 Drainage Basins and Hydrology 2-5
2.4 Governmental Structure 2-5
2.5 Review of Existing Plans and Regulations 2-10
2.6 Critical Facilities, Sheltering Capacity, and Evacuation 2-11

3.0 INLAND FLOODING 3-1

3.1 Setting / Historical Record 3-1
3.2 Existing Capabilities 3-1
3.3 Vulnerabilities and Risk Assessment 3-3
3.4 Mitigation Strategies and Actions 3-8

4.0 COASTAL FLOODING & STORM SURGE 4-1

4.1 Setting / Historical Record 4-1
4.2 Existing Capabilities 4-1
4.3 Vulnerabilities and Risk Assessment 4-1
4.4 Mitigation Strategies and Actions 4-1

5.0 HURRICANES AND TROPICAL STORMS 5-1

5.1 Setting / Historic Record 5-1
5.2 Existing Capabilities 5-1
5.3 Vulnerabilities and Risk Assessment 5-3
5.4 Mitigation Strategies and Actions 5-4

6.0 SUMMER STORMS AND TORNADOES 6-1

6.1 Setting / Historic Record 6-1
6.2 Existing Capabilities 6-1

TABLE OF CONTENTS (Continued)

Section **Page**

6.3 Vulnerabilities and Risk Assessment 6-2
6.4 Mitigation Strategies and Actions 6-2

7.0 WINTER STORMS AND NOR'EASTERS 7-1
7.1 Setting / Historic Record 7-1
7.2 Existing Capabilities 7-1
7.3 Vulnerabilities and Risk Assessment 7-2
7.4 Mitigation Strategies and Actions 7-3

8.0 EARTHQUAKES 8-1

8.1 Setting / Historic Record 8-1
8.2 Existing Capabilities 8-1
8.3 Vulnerabilities and Risk Assessment 8-1
8.4 Mitigation Strategies and Actions 8-2

9.0 WILDFIRES 9-1
9.1 Setting / Historic Record 9-1
9.2 Existing Capabilities 9-1
9.3 Vulnerabilities and Risk Assessment 9-2
9.4 Mitigation Strategies and Actions 9-2

10.0 DAM FAILURE 10-1
10.1 Setting / Historic Record 10-1
10.2 Existing Capabilities 10-1
10.3 Vulnerabilities and Risk Assessment 10-2
10.4 Mitigation Strategies and Actions 10-7

11.0 MITIGATION STRATEGIES AND ACTIONS 11-1
11.1 Status of Mitigation Strategies and Actions 11-1
11.2 Prioritization of Specific Actions 11-9

Tables

Table 2-1 Critical Facilities 2-12

Table 10-1 Dams Registered With the DEEP in the Town of Griswold 10-2

Table 11-1 Town of Griswold STAPLEE Matrix for Prioritizing Recommendations 11-10

TABLE OF CONTENTS (Continued)

Section **Page**

Figures

Figure 3-1 FEMA Special Flood Hazard Areas 3-5

Figure 10-1 Dam Failure Inundation Area Mapping 10-3

Appendices

Appendix A – Record of Local Adoption

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 to the Town of Griswold and the Borough of Jewett City. Background information and the regional effects of pertinent natural 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 Griswold and Jewett City, and is not to be considered a standalone document.

The primary goal of this hazard mitigation plan annex is to identify risks to natural 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.

1.2 Setting

The Town of Griswold is a rural community which is located approximate 4.5 miles to the east-northeast of the City of Norwich and approximately 18 miles -northeast of the City of New London. Griswold lies in the northeast portion of New London County and borders Windham County to the north. The town includes one borough, Jewett City, which is situated along Ashland Pond (the Quinebaug River) in the western portion of town along the boundary with the Town of Lisbon.

By 1715, what would become the Town of Preston was divided into two sections: the South Society and the North Society. The North Society was later transformed into the Town of Griswold. The establishment of Griswold as a town took place in 1815 when the North Society petitioned to the State General Assembly to incorporate the area as a town.

Griswold is approximately 37 square miles in area and had a population of 11,951 as of the 2010 census. The town is bordered mostly by the Town of Plainfield and partially by the Town of Canterbury (both towns within Windham County) to the north, the Town of Voluntown to the east, the towns of North Stonington and Preston to the south, and the Town of Lisbon to the west. The lone interstate in Griswold, which traverses the northwestern corner of town, is Interstate 395. Other significant routes which traverse different areas in town include: Route 12 (Plainfield Road), Route 201 (Hopeville and Glasgo Road), Route 138 (Voluntown Road), Route 164 (Preston Road), and Route 165 (Shetucket Turnpike)

1.3 Plan Development

The 2012 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. The HMP was updated in 2012 through a similar suite of data collection meetings with municipal staff, information meetings with the public, and a public workshop on climate risk assessment run by The Nature Conservancy (TNC). Since adoption of the 2012 HMP, the HMP has been available in local governmental offices and available to emergency personnel. Residents have been encouraged to contact the Emergency Management Director with any concerns regarding emergency response or potential projects related to natural hazard damage.

Based on the existing plan, existing information, and hazards that have occurred since 2012, 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 4th, 2016 announcing two public information meetings on the multi-jurisdictional HMP update. This press release was published in the Norwich Bulletin and The Day, as well as in relevant local "Patch" news websites. This notice was also posted on the SCCOG Facebook page and website. The public information meetings were held on November 28 and December 1, 2016, at the Town of Groton Library and the SCCOG office, respectively.

- A survey soliciting public input was hosted at www.surveymonkey.com/r/SCCOGHazard from October 17, 2016 through March 17, 2017. Topics addressed by the survey included the types of natural hazards that concern participants, the assets, infrastructure, and government services they feel are most at risk, and the types of mitigation measures they support. The survey link was publicized along with the public meetings in The Day, The Norwich Bulletin, and local *Patch* websites, and at all public meetings.

- A data collection meeting was held with Town of Griswold and Borough of Jewett City staff on January 26, 2017 to discuss the scope and process for updating the plan and to collect information. The Town Planner of Griswold coordinated the local planning team which included the Fire Chief/Road Superintendent and the Borough Warden. 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 the town and that should be addressed in the update.

- The draft that is sent for State review will be posted on the City website (http://www.griswold-ct.org/) as well as the SCCOG website (http://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 Griswold and the Borough of Jewett City will be coordinated by SCCOG and the Planning and Community Development Office. The HMP update must be adopted within one year of conditional approval by FEMA, or Griswold and Jewett City 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 Griswold **Planning and Community Development Office** will administer the HMP under the authority of the Board of Selectmen. The **Town Planner** will be the local coordinator of the HMP, and the Emergency Manager will be the deputy local coordinator. The Planning and Community Development Office 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 Board of Selectmen.

The HMP will be on file in the Town Planner's Office and at the Planning and Community Development Office, as well as posted to the Town website, to assist in guiding growth decisions. See Section 2.5 for recommendations related to integrating the findings of this HMP into other town planning documents. Griswold will encourage residents to contact the Planning and Community Development Office and the Fire Marshal's office (the Fire Marshal, currently, is the Emergency Manager) with concerns related to natural hazards or emergency response via the town's website. The Town will also publicize the fact that the HMP is available for public review at the Planning and Community Development Office as well as being posted on the town and SCCOG websites.

Griswold will review the status of plan recommendations each year. The Planning and Community Development Office, assisted by the Emergency Manager, 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 Planning and Community Development Office 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.

Griswold and Jewett City understand 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 the town. The Planning and Community Development Office will coordinate with SCCOG for the next HMP update which is expected to occur in 2022.

2.0 COMMUNITY PROFILE

2.1 Physical Setting

The Town of Griswold is a rural community that is 36.9 square miles in area and is located in northeast New London County, bordering Windham County to the north. Griswold is characterized by its many rivers, lakes, and farms. Several large rivers flow through town including the Pachaug River and Quinebaug River. The Borough of Jewett City is located at the junction of the Pachaug and Quinebaug Rivers. The borough contains the most densely developed land in Griswold.

Griswold contains two State Forests, the Pachaug State Forest and Hopeville State Forest. Within its boundaries, the Hopeville State Forest contains a campground, a beach, a boat launch, and many hiking trails. Many people travel to Griswold to hike the trails during the summer and fall months. One of the largest bodies of water in Griswold is Pachaug Pond, which is also the site of a State of Connecticut boat launch, a marina, and a campground. Pachaug Pond is an impoundment on the Pachaug River and is largely fed by the Pachaug River, Burton Brook, and Billings Brook.

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 Griswold.

In terms of North American bedrock geology, Griswold is located in the northeastern part of the Appalachian Orogenic Belt, also known as the Appalachian Highlands, which extend from Maine southward to Mississippi and Alabama. The Appalachian Highlands were formed when Pangaea assembled during the late Paleozoic era. The region is generally characterized by deformed sedimentary rocks cut through by numerous thrust faults. The western half of Griswold is located within the Merrimack Synclinorium of the Iapetos Geologic Terrane, while the eastern half is located in the Avalonian Anticlinorium of the Avalonian Geologic Terrane. There are numerous faults in Griswold, with the predominant Lake Char thrust fault at the boundary between the two terranes. This fault bisects the town and is oriented in a north-south direction. Two additional faults are located in the western section of the town, oriented in a southwest-northeast direction. An additional high angle fault parallels the Lake Char thrust fault just to the east of the major fault.

The town lies above eleven bedrock types. The largest formation is the Quinebaug Formation, which covers nearly the entire western half of town. The Preston Gabbro Formation (Dioritic phase) has a few small areas that lie within the boundaries of the eastern half of town. These formations are generally aligned in a northeast-southwest manner along the general alignment of a fault that traverses through the western half of town.

Griswold contains various bedrock types, with the greatest variation occurring east of the Lake Char fault. The primary formation to the west of the fault is the Quinebaug Formation, characterized by gray to dark-gray, medium-grained, well-layered gneiss. To the east of the Lake Char Fault, near vertical bands include Mylonite along Paleozoic faults, Waterford Group, Hope

Valley Alaskite Gneiss, Porphyritic phase of Potter Hill Granite Gneiss, "Scituate" Granite Gneiss and Plainfield Formation.

The eastern half of town is characterized by four faults. The faults branch with three branching off in a northwest-southeast orientation and one which is orientated in a northeast-southwest direction. The formations follow the faults in their orientations. The three most prominent bedrock formations in Griswold are briefly discussed below.

- The *Quinebaug Formation* is a grey to dark-grey, medium grained, well-layered gneiss. This formation accounts for almost the entire western half of Griswold.

- The *Hope Valley Alaskite GneissFormation* consists of light pink to grey medium to coarse grained granitic gneiss. This formation comprises approximately 15% of town.

- The *Preston Gabbro Formation* is comprised of a dark, medium to coarse-grained massive gabbro. Approximately 15% of town is covered by this formation.

The town's different surficial geologic formations include glacial till and stratified drift. Refer to the Multi-Jurisdictional HMP for a generalized view of surficial materials. The majority of the town is underlain by glacial till. The exceptions are Billings Brook, the Pachaug River, the Quinebaug River, and the many tributaries and ponds in town including Crooked Brook, Hawkins Brook, Norman Brook, Mill Brook, Hopeville Pond, Pachaug Pond, Clayville Pond, Ashland Pond, and other named and unnamed tributaries and water bodies throughout Griswold. These areas of stratified drift include sand, swamp, gravel, fines and alluvium.

Till contains an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. 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. However, the smaller glacial till watercourses can also cause flooding. The amount of stratified drift also has bearing on the relative intensity of earthquakes and the likelihood of soil subsidence in areas of fill.

2.2 Land Use and Development Trends

Approximately 74% of land in the Town of Griswold is not developed according to the 2006 *Plan of Conservation and Development* (POCD) (effective July 2007). According to the document, as of 2005, the total amount of developed land was approximately 5,857 acres, while the amount of undeveloped land was approximately 8,900 acres. The document defined "undeveloped" land as open space, reservoir and water supply, recreation, current agriculture, dedicated agriculture, and undeveloped. Not all undeveloped land is necessarily developable, however. Some land is owned by the Jewett City Water Company to protect their watershed from pollution, while other land is set aside for agriculture development. In addition, some forest properties are undevelopable due to steep slopes while others do not allow development due to their proximity to wetlands.

According to the POCD, 18% of the developed area of town is residential medium and high-density units, 54% are residential low-density units, 15% are transportation and utilities structures, while the remaining 13% is a combination of three uses including institutional, commercial, and industrial.

The"2006 Land Cover by Area" data developed by the University of Connecticut Center for Land Use Education and Research (CLEAR) showed approximately 66% of town covered by deciduous or coniferous forest and forested, non-forested, and tidal wetlands. 18% of the Town was used for turf and grass, other grasses, and agricultural field. Only 14% was "developed."

SCCOG data on land use collected in 2011 indicates that approximately 29% of town land is developed, 29% has been dedicated to open space, and 43% remains hypothetically open to development. Much of the gap between the CLEAR and SCCOG figures may be due to differences in land use designation criteria. For example, very low density residential is considered developed land by SCCOG, despite the fact that a large portion of each parcel may be open space.

According to the 2011 SCCOG data, 60% of Griswold's developed area is low and very low density residential land, while 15% is medium and high density residential. 14% is transportation, communications, or utility usage. The remaining approximately 12% of the developed area consists of industrial, commercial, and institutional uses.

The majority of the developed portion of Griswold is the Borough of Jewett City where a mix of residential, commercial, industrial, farmland, and open space is located. The second most developed area of Griswold is the area surrounding Glasgo and Doaneville Ponds along the Griswold-Voluntown town line. In this area, land uses include industrial, commercial and some high density residential. The remaining commercial and industrial lands are associated with the major roadways in town. The remaining land uses in town are largely defined by the POCD as being "undeveloped" and "open space". As explained in the current POCD, a 1993 POCD study found that land with no development constraints was scattered throughout town. Since then, some parcels are now being utilized for agricultural purposes.

The current POCD states that Griswold is actively seeking to attract economic development. Griswold created the Business Park zoning classification and has made it a priority of the town to locate a business or series of businesses which would develop at the business park.

The 2010 census population of the Town of Griswold and the Borough of Jewett City together was 11,951. Both residential and commercial development had slowed or stagnated at the time of the previous, 2012 HMP update, however Town staff noted that development has increased over the last five years.

Active Residential development projects include:

- An approved subdivision of 150 homes at Bishop Crossing Road and Roode Road was dropped after the previous HMP, and the land returned to forest and farmland.

- A major mixed-use development on Route 164 near the golf course is in its planning stages. The development will include commercial and residential units, as well as an Assisted Living institution.
- A mixed-use development on a reclamation site at Balfour and East Main Street, next to Ashland Pond, is proposed.
- A 102-unit condominium is under construction on Pleasant View Street.

Recent and active commercial development projects include:

- A commercial subdivision on Route 138 has been completed.
- A hotel project near I-395 has been completed.
- An Exxon Petro Max gas station has been built on Route 164.
- A hotel construction project on Route 164 is in its planning stage.
- United Community and Family Services is planning on constructing facility at 201 Mary Street.
- An Auto Repair Shop is proposed off route 138.
- The old mill on Anthony Street next to the Aspinook/Quinebaug river and the train tracks is being rehabilitated and converted into a major wind-turbine manufacturing center. The owner expects to be operational in 2017.
- A large, 7 megawatt-per-day solar farm is planned for an open-space area at the intersection of Route 138 and 201.

Demographic trends for the Town are similar to many other communities in Connecticut and are closely tied to the state's economy. According to Census 2010, approximately 22.9% of the population of Griswold was under 18 years of age, 66.5% was between the ages of 18 and 64, and 10.7% was 65 years and older. According to the University of Connecticut, Connecticut State Data Center (UCCSDC), the projected town population in 2030 is 13,413.

Although certain development opportunities exist throughout Griswold, the focus in most of the town is on either maintaining or improving the existing patterns of development. At the same time, Griswold desires economic growth, and the identification of areas capable of supporting economic development is a priority of Griswold. Many of the areas that are ideal for economic growth have some constraint to development (e.g. riverine flooding, steep slopes), so it is important to identify methods of overcoming those constraints if possible.

Preservation of open space is also important in Griswold. The Avalonia Land Conservancy is currently looking to acquire a large tract of forested land at the Griswold-Preston-North Stonington lines. This "Tri-Town Forest" will include 74 acres of land in Griswold, 302 acres in North Stonington, and 33 acres in Preston (409 acres of land overall).

The existing water supply system is provided by the Jewett City Water Company. The water and sewer systems of Griswold are capable of supporting all anticipated growth with service extensions. Although some expansion of other public facilities will be necessary to accommodate the future population of Griswold, the town's public facilities and utilities are not constraints to growth.

2.3 Drainage Basins and Hydrology

Griswold drains to two regional basins, the Pachaug River and the Quinebaug River. The town is divided among seven sub-regional basins: Billings Brook, Broad Brook, Mill Brook, Mount Misery Brook, Myron Kinney Brook, the Pachaug River, and the Quinebaug River. The majority of town (approximately 58%) drains directly to the Pachaug River sub-regional and regional watershed. Waterways in the northwest corner and along the western boundary flow towards the Quinebaug River: a tributary of the Thames River. Streams along the southwest perimeter flow towards Broad Brook: a tributary of the Quinebaug River. The northeast corner of town drains to Mill Brook: a tributary of the Quinebaug River. Waterways in the southeast corner flow towards Billings Brook, a tributary of the Pachaug River. A small portion of town along the southeast corner of town drains to Myron Kinny Brook, while a small portion of area along the northeast border of town drains to Mount Misery Brook. Both brooks are tributaries of the Pachaug River. All drainage basins eventually drain to the Thames River via the Quinebaug River and the Shetucket River.

There are a number of large water bodies within Griswold. The largest, Pachaug Pond, is located in the southeast section of town. Pachaug Pond lies generally in a north-south orientation between Routes 138 and 165 and covers approximately 817 acres of land. The pond is an impoundment formed by the Pachaug Pond Dam (Class C) at its northwest corner on the Pachaug River. Upstream impoundments on the Pachaug River include the Glasgo Pond Dam (Class C), the Town Line Pond Dam (Class A), and the Sawmill Pond Dam (Class C).

Hopeville Pond (approximately 107 acres) and Ashland Pond (approximately 89 acres) are both located on the Pachaug River downstream of Pachaug Pond in the east-central portion of Griswold. They are each impoundments created by dams of the same name. Clayville Pond is located on a tributary to the Quinebaug River in the northwest section of the town and formed as a result of the construction of the Clayville Road Dam (Class A per the CT DEEP 1996 dam inventory.

Aspinook Pond is located in the northwest corner of Griswold, bisected by the municipal boundary between Griswold and the adjacent town of Lisbon. Aspinook Pond is a reservoir impounded by the Aspinook Pond Dam located on the Quinebaug River in Griswold.

2.4 Governmental Structure

The Borough of Jewett City is a government within the government of the Town of Griswold. Those who live in the one square mile borough are taxed twice (for Jewett City and for Griswold). The borough government is made up of a warden and 4 burgesses who set policy and enforce the law of charter. The government also consists of a treasurer, assessor, clerk, tax collector, and bailiff. The Borough also owns the electric light plant and sewer plant (Jewett City Department of Public Utilities). Other municipal services are provided by the Town of Griswold.

Griswold is governed by a Town Meeting and Board of Selectmen form of government. The Town Meeting is the legislative body of the town and the Board of Selectmen is responsible for the administration of town policies. The authority of town officials is granted by Connecticut

General Statutes. Various Boards and Commissions are composed of elected and appointed officials who supervise, manage and organize the diverse functions of local government.

Many municipal departments, commissions, and boards are involved with natural hazard mitigation. The various town departments, boards and commissions which may play a role in the implementation of this plan include:

- ❑ Building Department – Building Official and Zoning/Wetland Enforcement Officer
- ❑ Planning & Community Development Office – Town Planner
- ❑ Public Works Department – Director of Public Works
- ❑ Fire Marshal Office – Emergency Management Director & Fire Marshal, Fire Chief & Road Superintendent
- ❑ Inland Wetlands and Watercourses Conservation Commission and Aquifer Protection Agency and the Planning & Zoning Commission
- ❑ Public Health and Safety Committee
- ❑ Open Space Land Acquisition Committee
- ❑ Economic Development Commission
- ❑ Space Needs Committee

The following subsections describe general departmental responsibilities, and duties related to natural hazard mitigation. Where applicable, one or more of the six types of mitigation (prevention, property protection, natural resource protection, structural projects, emergency services, and public education) are identified as relevant for each department.

Building Department – Building Official and Zoning/Wetland Enforcement Officer

The Building Official administers the Griswold's building inspection program adhering to and enforcing all code requirements of the State of Connecticut relating to building construction. Additional responsibilities include administering and enforcing all related state codes for the safety, health, and welfare of persons and properties in town, supervising departmental policies and procedures, and providing technical assistance to Griswold officials.

It is the Building Department's responsibility to review all proposed structures. Inspections and enforcement takes place according to the Connecticut State Building Codes relative to the manner of construction and materials to be used for the occupancy and maintenance of all buildings and structures within Griswold. It is also the Building Department's responsibility to grant or deny approval of all building materials, dimensions, structural integrity and zoning compliance. The Building Department must make available all building records, which are public information, during Town Hall business hours.

The Building Official has a unique responsibility when it comes to hazard mitigation as he is responsible for overseeing a number of codes such as those related to wind damage prevention as well as those related to flood damage prevention. Although other departments and commissions may review development plans and develop or revise regulations, many important types of pre-disaster mitigation are funneled through and enforced by the Building Department. For example, the Building Department enforces A-zone standards for floodproof construction

and building elevations, maintains elevation certificates, and enforces building codes that protect against wind and fire damage. Thus, the types of mitigation that are administered by the Building Department include prevention and property protection.

Additionally, the Building Official serves as the town's Zoning Enforcement Officer and Wetlands Enforcement Officer. As such, the Building Department investigates complaints received and issues, if necessary, orders with re-inspection to ensure compliance. The Enforcement Officer has the authority to turn non-compliant issues to Griswold's attorneys for legal action. The Enforcement Officer also has the ability to order immediate cease and desist of actions in any form in the interest of code compliance or public safety and general welfare.

The primary role of the Building Department during disaster situations is to provide damage assessment, inspect damaged buildings and issue permits for temporary structures and actions necessary to maintain safety standards.

Griswold Public Safety

The Griswold Public Safety group consists of Troop E (Montville) of the Connecticut State Police, the Public Utilities Emergency Department, the Griswold Volunteer Fire Department, and the Griswold Community Ambulance fleet.

The Town of Griswold Volunteer Fire Department consists of two fire companies, under the direction of a town-wide Chief. Mutual aid and automatic aid is provided to the towns that surround Griswold through county and state mutual aid agreements. The two fire companies in Griswold are the A. A. Young Jr, Hose and Ladder Company No. 1 (Jewett City Fire Department, Station 56), which is located in the Borough of Jewett City, and the Griswold Volunteer Fire Department, Station 55 which is located in the east-central portion of town near the border with the Town of Voluntown. The A.A. Young Jr. Hose and Ladder Company No. 1 is located at 105 Hill Street in the Borough of Jewett City section of Griswold. Station 55 is located at the intersection of Route 138 and Old Bethel Road (883 Voluntown Road). The Fire Departments are the primary agency involved with hazard mitigation through emergency services and public education.

Company No. 1 has a primary response area of District 1 which includes Route 12 to the Canterbury/Plainfield town line, Route 12 south to the Lisbon town line, west of I-395 and the Borough of Jewett City. Station 55 has a primary responsibility to serve District 2 which covers all of Griswold east of Station 55 to the Voluntown town line which includes I-395 North and south from the Lisbon town line to I-395 Exit 87 in Plainfield.

Ambulance services are provided by Griswold Community Ambulance, a private contractor founded by American Legion Post No. 15. They are currently located near the Town Hall but are moving to a new facility on Route 138. The agency has implemented Telehealth monitoring to provide daily monitoring of patients from their homes.

The Griswold Visiting Nurses Agency (VNA) is located in the former Ashland Mill Building. They are associated with Day Kimball Hospital in Putnam.

The Borough of Jewett City has two resident state troopers, but the remainder of Griswold relies on Connecticut State Police Troop E in the Town of Montville. The types of mitigation that are directly administered by the Police include mainly emergency services and public education. Communication and coordination between the Connecticut State Police and the two Fire Departments is critical before, during, and after natural hazard emergencies.

Public Works Department

The town has a Public Works Department whose responsibilities include construction and maintenance of roadways, sidewalks, and drainage systems; maintenance of all parks and school properties; street sweeping, sanding, and snow removal; the preservation, care and removal of trees within the town's rights-of-way and/or public places, and maintenance of town vehicles and equipment, and the bulky waste facility. Griswold has one public works garage, located on Route 138, where the town stores sand and salt among other equipment. The Public Works Department also assists the Town Parks Committees with maintenance of the town parks and assists with the upkeep of the athletic fields. Public Works has also provided assistance with the renovations of town hall in the past. With the large area of water bodies in town, Public Works assists the CT DEEP in the protection of the large beaver population and the assistance with flooding control.

As is common throughout Connecticut, Public Works Departments are often charged with implementing numerous structural projects that are related to hazard mitigation. Specifically, roadway/infrastructure maintenance and complaint logging/tracking are the two primary duties of the Public Works Department. For example, the Public Works Department tracks, plans, prepares for, and responds to flooding, inundation, and/or erosion of roads and infrastructure such as sewer pumping stations and the wastewater treatment plants (the Jewett City & the Glasco Water Pollution Control Facilities). The Public Works Department also conducts snow removal and deicing on roads, trees and tree limb removal in rights-of-ways, and maintains and upgrades storm drainage systems to prevent flooding caused by rainfall.

As a result of the duties described above, the Public Works Department is often the de facto first responder during emergencies. The Public Works Department must maintain access for the State Police and Griswold Fire Department to respond to emergencies.

Space Needs Committee

The Commission of thirteen is charged with identifying residents' needs within the community in the town. Identifying sites and planning accordingly alongside other town officials is instrumental in preparation for potential natural disasters and emergency response in the future.

Inland Wetlands and Watercourses Conservation Commission and Aquifer Protection Agency

Comprised of seven members and three alternates, the IWWCC & APA carries forth the regulations set in the Inland Wetland & Watercourses Conservation Commission Regulations (August, 2006).

Public Health and Safety Committee

The Public Health and Safety Committee is comprised of nine members and administers the town regulations pertinent to the health and safety of town residents and business people. In the event of a natural disaster, their direction when making decisions in this regard becomes a necessity.

Economic Development Commission

The Commission of five is charged to pursue opportunities to attract and expand the businesses stock in town. Additionally, the Commission seeks to maintain existing business to the greatest extent possible. Identifying sites and planning accordingly alongside other town officials is instrumental in preparation for potential natural disasters and emergency response in the future.

Open Space Land Acquisition Committee

The Committee of seven is charged to review potential acquisitions of land or interests in land for open space, natural resource protection, recreational or agricultural purposes in order to make recommendations to the Board of Selection regarding acquisition of land, use of the Open Space Land Acquisition Fund, and perform other tasks.

Fire Marshal Office – Emergency Management Director & Fire Marshal, Fire Chief & Road Superintendent

The Fire Marshal's Office conducts reviews on three family or greater homes and commercial buildings. Among other things, the Office also conducts emergency disaster planning, represents emergency services on various projects.

Planning & Community Development Office

The Planning and Community Development Office serves as the technical staff supporting the Griswold Board of Selectmen, the Planning and Zoning Commission, the Zoning Board of Appeals, the Inland Wetlands and Watercourses Conservation Commission, and the Economic Development Commission. In practice, the Town Planner enforces the local Zoning and Subdivision Regulations, provides staff assistance to the Planning and Zoning Commission, and performs long term planning activities related to land use and community development. The department is charged with the duty of drafting, updating and implementing the goals and objectives of the Griswold Plan of Conservation and Development which is currently being

updated. The Planning and Community Development Office provides assistance to the Building Department and is responsible for housing and economic development planning.

Because the Planning and Community Development Office assists the applicable commissions with administration of the Zoning Regulations, Subdivision Regulations, and Inland Wetland Regulations, the department is responsible for elements of almost all six facets of mitigation (prevention, property protection, natural resource protection, structural projects, emergency services, and public education).

Additional Groups

In addition to town offices, municipal titles, and commissions/committees, the American Red Cross and the Salvation Army provide services related to mitigation and emergency management. The American Red Cross and the Salvation Army help provide shelter and vital services during disasters and participates in public education activities.

2.5 Review of Existing Plans and Regulations

Griswold has two primary plans which act to address elements of hazard mitigation and disaster preparedness.

Plan of Conservation and Development (2007)

The Plan of Conservation and Development (POCD) was made effective on July 30, 2007 with contributions from local boards and commissions, citizens, and citizen groups. The purpose of the POCD is to balance growth with maintaining the quality of life that citizens within the town embrace. The POCD includes Jewett City.

The POCD includes the following actions that the Town has completed or was pursuing at the time:

- ❑ Continue to limit development in areas with steep slopes (20% or greater), wetlands, and areas of rock outcrops and shallow-to-bedrock soils, and 100 year flood zones
- ❑ Replace fire hydrants with higher capacity models
- ❑ Continue to work with developers and the town planner to ensure that adequate water supply sources are available
- ❑ Find a more suitable location for storing EMS equipment
- ❑ Implement a program for targeted improvement of the town roadway system

The POCD does not directly address hazard mitigation or natural hazards; however it does provide strategies for addressing development in floodplains, near steep slopes, and near wetland areas.

The Griswold POCD is considered inconsistent with the current goals and actions of the hazard mitigation plan. It does not directly address several of the hazards such as winter storm hazards, flood awareness, earthquake hazards, and wind hazards. The next update to the POCD

(scheduled for 2017, during the life of the current hazard mitigation plan) should incorporate more elements of the hazard mitigation plan.

Emergency Operations Plan

Griswold has an EOP in place signed by the First Selectman, approved by the Board of Selectmen, and extending the duties and powers of the First Selectman and/or his designee in the event of a declared emergency. The EOP has an annex applicable to severe weather and natural hazards. The EOP is reviewed and updated annually.

Regulations and Ordinances

Hazard prevention includes identification of risks and the use of land-use regulatory and other available management tools to prevent future damage. Griswold 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 floodplain management.

The Town of Griswold and the Borough of Jewett City have separate Zoning regulations. The Town of Griswold's Zoning Regulations have been revised to May 12, 2016. The Borough of Jewett City's Zoning Regulations have been revised to January 1, 2014.

The town and the Borough use the same Subdivision Regulations, which have been revised to June 1, 2015. The Borough has a flood ordinance, while flooding regulations in the remainder of Griswold are in Section 11.4 of the Zoning Regulations. A comprehensive set of Flood Regulations for all of Griswold were published in July 2011, and refer to the FEMA Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) dated July 18, 2011. These regulations are Griswold's articulation of the NFIP regulations.

Stormwater requirements are noted in Section 4.4 of the Subdivision Regulations, where low impact development techniques are encouraged and the state's *Stormwater Quality Manual* is identified as the design guideline.

2.6 Critical Facilities, Sheltering Capacity, and Evacuation

The Town of Griswold and Borough of Jewett City consider that several categories of facilities are critical for these are needed to ensure that emergencies are addressed while day-to-day management of the community continues. The two Fire Departments, Town Hall, Public Works Garage, Senior Center, its four schools, and Waste Water Treatment Plant (WWTP) are considered to be Griswold's critical municipal facilities. Table 2-2 lists the critical facilities in Griswold. A few notable categories of critical facilities are discussed below.

Table 2-1: Critical Facilities

Facility	Address or Location	Emergency Power Supply?	Shelter?	In Floodplain?
Emergency Services				
Griswold Volunteer Fire Co.	883 Voluntown Road	Yes	Yes	No
A.A. Young Jr. Hose & Ladder Co. #1	105 Hill St, Jewett City	Yes	Yes	No
Griswold Youth & Family Services (Previously the Griswold Visiting Nurses Association Site)	68 Ashland St, Jewett City	No	No	Yes
Municipal Facilities				
Town Hall	28 Main Street	No	No	No
Public Works Garage	1148 Voluntown Rd (Rte.138)	No	No	No
Senior Center	28 Main Street	No	Yes	No
Griswold Elementary School	303 Slater Ave, Jewett City	Yes	Yes	No
Griswold Middle School	211 Slater Avenue	No	No	No
Griswold High School	267 Slater Avenue	No	No	No
Health Care / Senior Living				
Ashland Manor (Housing Authority)	Ashland Street	No	No	No
McCluggage Manor (Housing Auth.)	Taylor Hill Road	No	No	No
Ledgewood Apartments	Pleasant View Drive	No	No	No
United Community & Family Services	76 Main Street	No	No	No
Other Infrastructure / Facilities				
Wastewater Treatment Plant	Wedgewood Drive	No	No	Yes
Little Log School House (daycare)	242 Bitgood Rd, Jewett City	No	No	No
Headstart (daycare)	129 E. Main St, Jewett City	No	No	No

Town Hall

The Town Hall is located within a complex that serves to centralize several public services and facilities in one area. This complex consists of the Town Hall, Slater Library, and the Griswold Senior Center.

Fire Department Facilities

The Griswold Volunteer Fire Department is located at the intersection of Route 138 and Old Bethel Road. This building is also the Town's Emergency Operations Center. The plans for the building show that it should be at least one foot out of the floodplain, but the previous FIRM suggested that it was in the floodplain. The current DFIRM shows that it is not in a Special Flood Hazard Area (SFHA) floodplain. The SFHAs are land areas covered by 1 percent annual chance flood events, which are FEMA-designated Zones AE (1 percent annual chance flood zone with elevations) and Zone A (1 percent annual chance flood zone without elevations). The Fire Department did not flood during the heavy rain events in March of 2010.

The A.A. Young Jr. Hose and Ladder Company No. 1 is located on Hill Street in Jewett City and is not situated in the floodplain. The Town contracts its Ambulance services to American Ambulance; these vehicles are housed at the A.A. Young Jr. Hose and Ladder Company No. 1

building. American Ambulance's offices are located on the second floor of the Griswold Youth & Family Services building. They are considering construction of a new site, or the reuse of the old Community Ambulance Building, to have a dedicated ambulance service site.

The POCD notes that the Department of Fire and Rescue recommend construction of two new sub-stations in the areas of Griswold not adequately served by the existing stations.

Shelters

Emergency shelters are considered to be an important subset of critical facilities as they are needed in emergency situations. These are not to be confused with safe rooms or individual storm shelters, such as designated rooms in certain buildings that are meant to provide increased levels of protection from winds. A primary shelter should have the ability to operate with a standby source of power such as an emergency generator. While FEMA's mitigation programs are not able to fund generators, other funding programs are available for purchase of generators. The most notable example is the "Emergency Operations Center and Emergency Shelter Generator Grant Program" administered by Connecticut Department of Emergency Management and Homeland Security (DEMHS). This program specifically targets emergency operations centers and shelters, and awards can only be made for municipal facilities.

The Griswold Volunteer Fire Department is the primary shelter. It has a generator that was purchased in July of 2011. The facility can hold approximately 50 people and is American Red Cross (ARC) certified. The A.A. Young Jr. Hose and Ladder Company No. 1 is the backup shelter with a generator. The facility can hold 75 people but has not gone through the ARC certification process. The tertiary shelter is the Griswold Elementary School. It is currently undergoing construction, but it can hold about 400 people in the gymnasium. It has a generator but has also yet to pass through the ARC certification process. While the Elementary School can hold approximately 400 people, Griswold lacks ample bedding for the location.

The Senior Center is an emergency shelter but does not have a generator. During Tropical Storm Irene, the Senior Center was used primarily for logistics (sorting food deliveries to seniors, etc.). The ARC plans to evaluate the Senior Center to determine shelter requirements in the near future.

Evacuation Routes

Griswold does not have a published evacuation map, but rather utilizes state roads or local roads to exit the town. The SCCOG Long Range Regional Transportation Plan (LRRTP) (FY 2011-2040) addresses the adequacy of the existing transportation system in southeast Connecticut to move large numbers of people in the event of some type of disaster. Griswold uses the LRRTP for guidance when evacuation is needed. The LRRTP also has a bypass plan with the CT DOT for re-routing traffic on I-395 during emergencies. An example of this use was an overturned propane truck which happened within the past few years. Higher capacity egress routes from Griswold include Interstate 395, Route 138, Route 201, Route 164, Route 165, and Route 12. The LRRTP does recommend increasing the capacity of Interstate 395.

Communication

Griswold relies on radios, email, telephone, and cellular phone service to communicate. The town recently received a public works grant through the State of Connecticut to upgrade its radio systems. All fire trucks have both low band and high band radio capabilities and the town can communicate with the State of Connecticut.

Emergency personnel had difficulty communicating with important town staff during the long Tropical Storm Irene power outage because cellular phone towers were without power and many trees had damaged telephone lines. In response, Griswold now has additional radios for the building inspector and sanitarian.

There are a number of public communication capabilities that exist within the Town but are not operated by the Town government, and do not reach the Town's entire population. These include:

- The Public School has a system for contacting parents of students.
- Baptist Church in Jewett City has a PA system in its belltower that can be used to send out warnings to the limited area within earshot
- Wolverine Radio began operating on Main Street two years ago. Emergency communications can be broadcast through that service.

The Town is interested in developing agreements and arrangements to utilize these public communication methods in case of public emergency.

3.0 INLAND FLOODING

3.1 Setting / Historical Record

In general, the potential for flooding in Griswold is concentrated in areas along established SFHAs. SFHAs in Griswold are delineated on a Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS). The FIRM delineates areas within Griswold that are vulnerable to flooding and was most recently published on July 18, 2011 combined with the remainder of New London County. The majority of the inland watercourses and water bodies in Griswold are mapped as Zone AE while Clayville Pond, Stone Hill Reservoir Dam, Crooked Brook, Sheep Barn Brook, Doanville Pond, and Billings Brook are mapped as Zone A.

There are many Zone A floodplains in Griswold. These floodplains are difficult to work with because it is hard to determine if a property is actually in the floodplain based on elevation. The town believes that there are errors in the FEMA floodplain defined for the Pachaug River, but commissioning a new FEMA study is difficult and conducting a new study is very expensive.

The areas impacted by overflow of river systems are generally limited to river corridors and floodplains. Indirect flooding that occurs outside floodplains and localized nuisance flooding along tributaries has also been a common problem in different inland areas in Griswold.

The March 2010 storms continue to be considered the event that caused the most widespread flooding in Griswold since the town began participating in the multi-jurisdiction hazard mitigation plan:

- Many Griswold roadways were flooded during the March 2010 rain events. The roadways that were flooded include Sheldon Road, Cross Road, Mill Road, Carol Road, Sibicky Road, Ashland Street, Lilly Pond Road, South Main Street, Anthony Street, K of C Drive, Wedgewood Drive, Hopeville Road between Monroe and Lake Roads, Burlenson Lane, Shetucket Turnpike (Route 165) near the bridge area between the ponds, Brewster Road at Route 164, and Terry Road.

- Route 138 was inundated by three to four feet of water during the flood of March 2010. As a result, the roadway was closed for three to five days.

- Approximately 35 condominium units on South Main Street were flooded during the storm of March 2010. In this area, two condominium complexes close to the Quinebaug River lie within the SFHA floodplain and/or the 0.2 percent annual chance floodplain.

3.2 Existing Capabilities

The Town and Borough have in place a number of measures to mitigate for flood damage. These include regulations, codes, and ordinances preventing encroachment and development near floodways; and monitoring efforts and emergency services. The town attempts to mitigate flood damage and flood hazards by utilizing a wide range of measures: restricting activities in

floodprone areas, replacing bridges, promoting flood insurance, acquiring floodprone structures, maintaining drainage systems, through education and outreach, and utilizing warming systems. While there is currently no municipal budget specifically for flood hazard mitigation, dollars are spent for the reduction of flood damage through the acquisition of open space, drainage systems improvements, education, staffing and other areas.

As mentioned in Section 2.5 above, the Borough of Jewett City has a flood ordinance, while flooding regulations in the remainder of Griswold are in Section 11.4 of the Zoning Regulations. Chapter 9 of the Griswold Town Code is entitled "Flood Damage Prevention and Control," and the Planning and Zoning Commission, the Inland Wetlands Commission, and the Building Department are all charged with reviewing projects and developments in SFHAs as well as projects not located in SFHAs that will alter hydrology and runoff. A comprehensive set of Flood Regulations for all of Griswold was published in July 2011. These regulations are Griswold's articulation of the NFIP regulations. Recent and ongoing flood mitigation is described below.

Both bridges on Bitgood Road over the Pachaug River have recently been replaced and upgraded to provide adequate conveyance for a 1% annual-chance storm event. The Edmond Road Bridge over the Pachaug has been similarly replaced and upgraded.

The Public Works Department is in charge of the maintenance of the Griswold's drainage systems and performs clearing of bridges and culverts and other maintenance as needed. Drainage complaints are routed to the Public Works Department and recorded. The town uses these reports to identify potential problems and plan for maintenance and upgrades. Griswold officials also have a wish-list of potential projects including the re-routing of drainage on Sheldon Road (discussed further in Section 3.3.1) and either the acquisition of a floodprone property on Popple Bridge Road or a drainage upgrade to the road. Some improvement has been made to drainage along Sheldon Road with the replacement of a fifteen-foot culvert with two eighteen-foot culverts near Carol Road.

The town maintains a list of scour-prone critical bridges which are inspected during floods. These include Edmond Road over the Pachaug River, Bitgood Road over Hopeville Pond (Pachaug River), Sheldon Road over Doaneville Brook, Norman Road over the Pachaug River, and Ashland Street over the Pachaug River.

Griswold is continually working to improve its road and bridge infrastructure, especially with regards to flood resilience. Additional bridge replacements or removals are scheduled for the next five years, including:

- ❑ Replacement of the bridge on Sheldon Road over Doaneville Pond to 1% annual-chance storm capacity
- ❑ Replacement of the bridge on Norman Road over Ashland Pond to 1% annual-chance storm capacity
- ❑ Removal of the Carol Road Bridge and retirement of that Road

Griswold Public Works stores sandbags and palates for their transportation at the DPW garage. There are six palates pre-loaded with filled bags ready for deployment from that site in case of imminent flooding. These bags are washed and reused after events.

Griswold joined the Avalonia Land Conservancy, Inc. Land Trust in 1972, combining with the founding Towns of Groton, Ledyard, North Stonington, and Stonington. Also joining in 1972 were the Towns of Preston and Voluntown, while Sprague was added in 2007. Avalonia works with the municipalities, including Griswold, to assist with the acquisition of potential floodprone property in Griswold. The Avalonia Land Conservancy acquired Bartons Island in Pachaug Pond in 2011.

Summary

In general, municipal capabilities to mitigate flood damage have increased slightly since the 2012 edition of the hazard mitigation plan was adopted. This is likely because the Town and Borough have invested resources in public works, roadway, and drainage projects.

3.3 Vulnerabilities and Risk Assessment

This section discusses specific areas at risk to flooding within Griswold. Inland flooding due to poor drainage and other factors is also a persistent hazard in the town and can cause minor infrastructure damage, expedite maintenance, and create nuisance flooding of yards and basements.

According to the 2011 FEMA FIRM GIS data layers, a total of 2,643 acres of land in Griswold is located within the SFHA, and a total of 3,253 acres of land is located within the 500-year flood boundary (which includes the areas within the SFHA boundary).

3.3.1 Vulnerability Analysis of Areas along Watercourses

The two main rivers that contribute to flooding in Griswold are the Quinebaug River and the Pachaug River. The Quinebaug River flows southwest from Massachusetts into Connecticut to its confluence with the Shetucket River, approximately three miles above Norwich, Connecticut. The Quinebaug River is approximately 62 miles long and the principal tributaries are the French, Five Mile, Moosup, and Pachaug Rivers. In Griswold, the Quinebaug River forms the western corporate limits. The Pachaug River flows through Griswold to its confluence with the Quinebaug at Jewett City. Buildings located in flood hazard areas are primarily residential but also include some commercial, industrial, and critical facility structures. The majority of the structures that are threatened by flooding are located within the SFHA floodplain. Refer to Figure 3-1 for a depiction of SFHAs in Griswold.

Griswold has several major transportation routes, which include Interstate 395, Route 201 and Route 138. A series of crossings of the highway have been constructed to allow passage of roadways under and over I-395.

There are several roads throughout Griswold which have the potential to flood. These roads include Bitgood Road, Route 138, Old Bethel Road, Norman Road, and Edmund Road along the Pachaug River. The replacement of the Bitgood Road and Edmund Road bridges has decreased the risk of flooding on those roads. The planned replacement of the Norman Road Bridge should decrease that road's flood risk.

Route 138 was inundated with three to four feet of water during the floods of March 2010. As a result, the road was closed for three to five days. Other roads also of concern are Rhode Road intersected by Mill Brook, and Banjo Sullivan Road and Campbell Road along Crooked Brook. These roads could inhibit vehicle travel during severe storms.

Many other roads were inundated to different extents during the March 2010 storm including: Sheldon Road, Cross Road, Mill Road, Carol Road, Sibicky Road, Ashland Street, Lilly Pond Road, South Main Street, Anthony Street, K of C Drive, Wedgewood Drive, Hopeville Road between Monroe and Lake Roads, Burlenson Lane, Shetucket Turnpike (Route 165) near the bridge area between the ponds, Brewster Road at Route 164, and Terry Road.

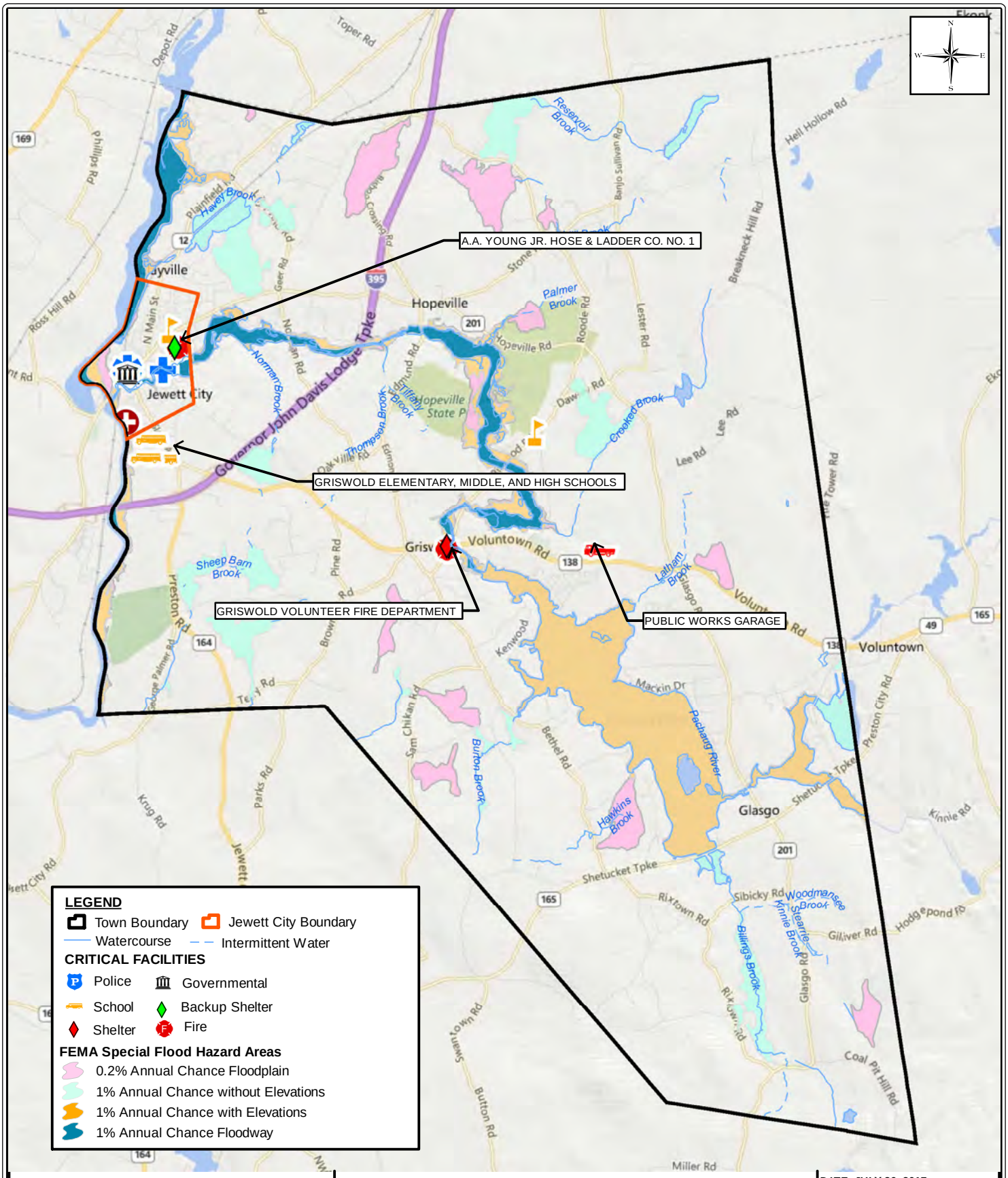
The culvert at the intersection of Carol Road and Sheldon Road has historically had difficulty conveying water, but has recently been replaced with two higher-capacity culverts. Backwater conditions in Mill Pond (a small impoundment of the Pachaug River upstream of Carol Road) continue to be an issue, causing water to flow down Sheldon Road. Structures are not affected by this flooding; however, the road does wash out and is damaged. The Mill Pond is impounded by a private dam directly beneath the bridge on Carol Road. The constriction between the dam and the low chord of the bridge is a contributing factor to the flooding, but the dam was installed by an "act of congress" and cannot be removed easily. Griswold would like to remove the bridge on Carol Road, and possibly remove the dam altogether.

Approximately 35 condominium units were flooded on South Main Street during the flood of March 2010. Two complexes in Griswold lie within the SFHA floodplain and/or the 0.2 percent annual chance floodplain. Along the same lines, three homes on Burlson Lane were inundated during the March 2010 event. Three homes in the area appear to fall within the SFHA floodplain, with additional homes appearing to lie in the 0.2 percent annual chance floodplain. Construction beneath Ashland Street may have contributed to the Burlson Lane flooding.

The Lakeview Mobile Home Park on Sheldon Road is located adjacent to Doaneville Pond, an impoundment of the Pachaug River. Although the Park is located outside of the Zone A SFHA, the Park was inundated by three to four feet of water during the March 2010 flood. Water essentially reached the bottom of each unit, and access to the area was difficult. Residents needed to be relocated and sheltered.

Water reached up to six feet deep in the basement of two houses on Mill Road (private road) during the March 2010 storms. It is not known whether the property owners made an insurance claim. One residence experienced a subsequent fire which rendered the property uninhabitable. Griswold is pursuing removal of the Rubber Pond dam, an action it expects will decrease flood risk in this area. There is a Zone A floodplain in the area from Doaneville Pond but it does not intersect any structures.

MXD: Y:\3570-09\Maps\annex_maps\Griswold\Figure 3-1.mxd



LEGEND

- Town Boundary
- Jewett City Boundary
- Watercourse
- Intermittent Water

CRITICAL FACILITIES

- Police
- Governmental
- School
- Backup Shelter
- Shelter
- Fire

FEMA Special Flood Hazard Areas

- 0.2% Annual Chance Floodplain
- 1% Annual Chance without Elevations
- 1% Annual Chance with Elevations
- 1% Annual Chance Floodway

MILONE & MACBROOM
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www.miloneandmacbroom.com

FEMA SPECIAL FLOOD HAZARD AREAS

SCCOG HAZARD MITIGATION UPDATE
TOWN OF GRISWOLD ANNEX

GRISWOLD, CONNECTICUT

SOURCE: NATIONAL FLOOD HAZARD LAYER, FEMA, 2017

DATE: **JULY 26, 2017**		
SCALE: **1"=5,500 '**		
PROJ. NO.: **3570-09**		
DESIGNED **SB**	DRAWN **PS**	CHECKED **DM**

DRAWING NAME:

FIG. 3-1

The WWTP is located at the end of Wedgewood Drive by the Quinebaug River. Part of the facility is located in the floodplain. At the time of the previous edition of this HMP, Griswold had tentative approval from the State of Connecticut and FEMA to receive grant funding under the HMGP to extend a floodwall around the facility pending completion of this HMP update; however that funding was never granted. The Town intends to continue to pursue funding for the floodwall extension.

3.3.2 Vulnerability Analysis of Private Properties

Based on a review of the Town of Griswold's Flood Insurance Rate Maps and topographic maps, residential structures that are subject to flooding during significant flood events are near the Quinebaug River. One area of concern along the Quinebaug River is near Arbor Road. There are several structures along the Quinebaug that are in flood hazard areas.

Griswold's main area of commercial and industrial development is in the Borough of Jewett City. The confluence of the Quinebaug and Pachaug Rivers is south of the Borough of Jewett City. Several other ponds such as the Aspinook Pond, Ashland Pond, and Clayville Pond border this commercialized area of Griswold. The developed areas in Jewett City appear to be free from flooding, which reduces the hazard potential.

The software platform *ArcGIS* was utilized along with 2008-2009 aerial photography to determine the number of properties located within the various SFHAs within Griswold as discussed above. There are approximately nine structures with at least a portion of the structure located within the mapped SFHA floodplain of the Quinebaug River and 25 structures within the 0.2 percent annual chance floodplain of the Quinebaug River. Approximately 10 structures are located within the mapped SFHA floodplain of the Pachaug River, with an additional six structures in the 500-year floodplain. The majority of structures in a mapped floodplain are located adjacent to the Hopeville and Pachaug Ponds on the Pachaug River. Approximately 67 structures are located in the SFHA floodplain, with an additional 14 in the 0.2 percent annual chance floodplain.

Based on correspondence with the State of Connecticut NFIP Coordinator, there are no repetitive loss properties (RLPs) located in Griswold. Griswold recognizes that many private properties may suffer flood damage that is not reported because the structures are not insured under the NFIP. These residents and business owners are likely repairing structures on their own. Flood mitigation as recommended in this plan will likely help many of these properties' owners. Those instances where private homes became inundated were often associated with flooding from waterways. These events are outlined below.

- Approximately 35 condominium units were flooded on South Main Street during the rainstorms of March 2010. There are two complexes near the Quinebaug River that lie within the SFHA floodplain and/or the 0.2 percent annual chance floodplain.

- Three houses flooded on Burlson Lane during the March of 2010 floods. Three homes in this area appear to be in the SFHA floodplain, with additional homes in the 0.2 percent annual chance floodplain. Constriction under Ashland Street may have contributed to the flooding.

- The Lakeview Mobile Home Park on Sheldon Road is located adjacent to Doanville Pond, an impoundment of the Patchaug River. Although the park is located outside of the Zone A SFHA floodplain, the park had three to four feet of water in following the flood of March 2010. Water was essentially up to the bottom of each unit, and access to the area was difficult. Residents needed to be relocated and sheltered.

- Water reached up to six feet deep in the basement of two residences on Mill Road during the floods of March 2010. It is unclear to the town if the property owners made insurance claims. One of the homes had a subsequent fire and the property became uninhabitable. Griswold is considering this property to be a potential acquisition project. There is a Zone A floodplain in the area from Doanville Pond. Although, it does not intersect any structures.

- A house on Popple Bridge Road was another acquisition project submitted under the HMGP. The home had 10 to 12 feet of water in the backyard during the storm of March 2010. The water infiltrated through the retaining wall and flooded the basement. The Fire Department had to pump out the basement for 28 consecutive hours until the floodwaters receded. The homeowner did not submit a flood claim so there is no record of the damage, so the mitigation funding application was ranked relatively low. Griswold would like to purchase the property and turn it into a retention area, but so far has not succeeded in this effort. The Town has placed a drainage easement on neighboring property owners to install improved drainage infrastructure. The Town also hopes that removal of the Rubber Pond Dam will lower flood risk here.

- Those properties located in floodplains, but not included in town officials' list of significant inundation include:

- Camper's World, an RV camping park, is located in the floodplain of the Pachaug River adjacent to Hopeville Pond.

- Residences on Mallard Point are located in the SFHA of Hopeville Pond.

- A residence on Rill Brook Road is located in the floodway of the Pachaug River.

3.3.3 Vulnerability Analysis of Critical Facilities

The majority of Griswold's critical facilities are located in the Borough of Jewett City and are not in flood hazard areas. One exception to the majority is the Griswold Volunteer Fire Department, Station 55, which is the town's EOC as well as the town's primary shelter equipped with a generator purchased in July 2011 and able to accommodate 50 people. Station 55 is located at 883 Voluntown Road (Route 138) at the intersection of Voluntown Road and Old Bethel Road and borders Zone AE. However, Station 55 did not flood during the floods of March 2010. During the March 2010 event, Route 138 had three to four feet of flooding from the Pachaug Pond and the Pachaug Pond Dam (Class C). CT DOT and the town closed the road for three to five days.

The town had previously wished to add a retaining wall at Station 55; however, they now believe that the FEMA mapping in this area is out of date, and places the Fire Station closer to the floodplain than it truly is. They wish to reassess the floodplain extent before pursuing construction of a wall.

The Jewett City WWTP is located at the end of Wedgewood Drive by the Quinebaug River. Part of the facility is located in both the SFHA AE zone and Zone X 0.2 percent annual chance floodplains. Griswold continues to pursue construction a floodwall around the facility.

3.4 Mitigation Strategies and Actions

A number of measures can be taken to reduce the impact of a flood event. These include measures that prevent increases in flood losses by managing new development, measures that reduce the exposure of existing development to flood risk, and measures to preserve and restore natural resources. These are listed in Section 11 under the categories of prevention, property protection, structural projects, public education and awareness, natural resource protection, and emergency services.

4.0 COASTAL FLOODING & STORM SURGE

4.1 Setting / Historic Record

Griswold is not located along the coastline or along any tidally-influenced river. It is also not located in a potential hurricane surge zone. No coastal flooding or storm surge has affected the town since the last HMP. Therefore, Griswold is considered to be immune to the direct effects of coastal flooding and storm surge.

4.2 Existing Capabilities

Griswold does not have any regulations in affect to restrict development due to coastal flooding hazards.

4.3 Vulnerabilities and Risk Assessment

No areas of Griswold are vulnerable to coastal flooding or storm surge.

4.4 Mitigation Strategies and Actions

No mitigation measures for reducing the impact of coastal flooding or storm surge are necessary or are proposed within Griswold.

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. Wind hazards are widespread and can affect any part of Griswold. However, some buildings within town are more susceptible to wind damage than others.

Tropical Storm Irene impacted the region in August 2011. Branches, trees, utility lines, and other items fell throughout town, while areas along roads and near residences being the hardest hit areas. Electricity was lost to the entire town for approximately two and a half weeks following Tropical Storm Irene.

On October 29, 2012, Griswold felt the effects of Sandy, a hybrid storm with both tropical and extra tropical characteristics. This storm caused widespread power outages, lasting a week or more. High winds felled trees, taking down power lines, and making many roads impassable.

5.2 Existing Capabilities

Existing mitigation measures appropriate for flooding have been discussed in Section 2.0. These include the ordinances, codes, and regulations that have been enacted to minimize flood damage.

Preparedness

The Fire Company regularly performs training exercises to prepare for events including Category 3 and 4 Hurricanes.

Tree Maintenance

Parts of trees (limbs) or entire tall and older trees may fall during heavy wind events, potentially damaging structures, utility lines, and vehicles. Two utility companies provide power within Griswold; the Jewett City Power Utility serves Jewett City Borough, while Eversource (which acquired Connecticut Light and Power (CL&P)) serves the rest of the Town. Both utilities provide tree maintenance near their power lines. In response to the major power-outages caused by Tropical Storm Irene and Hurricane Sandy, as well as significant winter storm events, Eversource has taken an aggressive approach to tree maintenance and has improved communication and coordination with municipalities. Town staff report that tree trimming and removal by Eversource has been extensive, especially along Rixtown Road (where over 37 miles of trimming has occurred). Tree maintenance is prioritized based on reported outages. While maintenance practices have improved since the previous HMP edition, the Town still experiences many outages, including in January of 2017 during a nor'easter.

Power outages are reportedly not a problem in Jewett City. Tree maintenance is performed by the Department of Public Works.

The town has a Tree Warden which works off the Public Works' budget that includes $5,000 per year for tree maintenance. The Public Works staff trims smaller trees, while jobs involving larger trees and those near power lines have historically been contracted out. The Town has been reimbursed by FEMA for costs exceeding the regular budget once or twice.

All utilities in new subdivisions must be located underground whenever possible in order to mitigate storm-related damages. However, Griswold has no plans to bury existing utilities because of the high cost to do so. Main Street alone would be in exceedance of six million dollars. The power lines are not municipally owned and the project would be very expensive. This being said, there are very few areas where utilities are underground.

Debris Management

Griswold collects and performs chop/chip operations on debris during and after storms. Excess debris is stored at the Town transfer station until it is processed; with the field in front of the Public Works building has a backup brush disposal area. The Town is also a member of the SCCOG incinerator agreement that allows it to borrow equipment and utilize the incinerator to dispose of excess debris as needed.

Wind Loading

Wind loading requirements are addressed through the state building code. The 2005 Connecticut State Building Code was most recently adopted with an effective date of October 1, 2016. The code specifies the design wind speed for construction in all the Connecticut municipalities. The ultimate design wind speed for Griswold ranges from 125 to 145 miles per hour depending on the building use (for example, hospitals must be designed to the higher wind speed). Note that changes in design wind speed figures are largely the result of a shift from "nominal" to "ultimate" wind speeds, for compatibility purposes; see the Connecticut Building Code or the American Society of Civil Engineers website for more information. Griswold has adopted the Connecticut Building Code as its building code.

Connecticut is located in FEMA Zone II regarding maximum expected wind speed. The maximum expected wind speed for a three-second gust is 160 miles per hour. This wind speed could occur as a result of either a hurricane or a tornado in south-central and southeastern Connecticut. The American Society of Civil Engineers recommends that new buildings be designed to withstand this peak three-second gust.

Griswold's structure stock consists of many historic buildings and homes greater than 50 and sometimes 100 years old. According to the town's POCD there are seventeen structures in Griswold that have been listed on the State Register of Historic Places. In addition, 119 properties within the Borough of Jewett City and 73 properties in the remaining land of Griswold are historically and/or architecturally significant to the history of the town. There are also four

mobile home parks in Griswold which are often more susceptible to wind damage. Mobile home parks are located on Hopeville Road, Norman Road, Glasgo Road, and Sheldon Road.

According to town officials, town-owned critical facilities do not have wind-mitigation measures installed to specifically reduce the effects of wind. Thus, it is possible that nearly all of the critical facilities in Griswold could be damaged by hurricane-force winds as any other structures.

Newer critical facilities, such as the Griswold Middle School, meet current building code requirements and are therefore considered to be the most resistant to wind damage even if they are not specifically wind resistant for hurricane gusts. Note that the high school is not specifically designed to withstand hurricane force winds, and this is something the town is concerned with if used as a shelter in its current design during a high-wind weather event.

Sheltering Needs

The Town currently determines sheltering need based upon areas damaged or needing to be evacuated within the town. Under limited emergency conditions, a high percentage of evacuees will seek shelter with friends or relatives rather than go to established shelters. During extended power outages, it is believed that only 10% to 20% of the affected population of town will relocate while most will stay in their homes until power is restored. In the case of a major (Category Three or above) hurricane, it is likely that the town will depend on state and federal aid to assist in sheltering displaced populations until normalcy is restored.

Summary

In general, municipal capabilities to mitigate hurricane damage have increased since the 2012 edition of the hazard mitigation plan was adopted, especially in the areas of tree maintenance and preparedness.

5.3 Vulnerabilities and Risk Assessment

As noted in Section 5 of the main plan, the region has experienced a number of significant storms in recorded history. The most recent storms include Tropical Storm Irene and Winter Storm Alfred, which results in extensive damage throughout the state. Additional details on these storms and general data on winds speeds and damage can be found in the Regional Plan. Griswold is located away from the shoreline; however the town is still vulnerable to flooding from water bodies during tropical storms or hurricanes and is as susceptible as coastal areas to hurricane wind damage. Of particular concern are the blockage of roads and the damage to the electrical power supply from falling trees and tree limbs. Many of the roads are narrow and bordered by private forest land, which is not cleared back from the right-of-way to prevent serious problems resulting from high winds.

Damage to trees and buildings, and resulting power outages, as a result of winds has historically been one of the most problematic issues facing Griswold during storms with high winds. Mitigating damage to utility lines and infrastructure and property and injury or loss of life must be implemented. Mitigation for wind damage is therefore a large component in the success of

common storms which impact Griswold. As a result, the following further describes the importance of ongoing tree maintenance in town.

5.4 Mitigation Strategies and Actions

Although the Tree Warden actively enforces the tree ordinance, time and budgetary constraints hamper the Tree Warden's ability to be as effective as needed to help prevent wind problems. Pruning tree limbs should be conducted in addition to removal of older or dying trees. The town should look to work tree trimming/pruning into applications for projects within town and, wherever possible, seek an increase in funding improve upon its tree maintenance and pruning operation.

The town should implement the education of wind events and other natural hazards into educational curriculums for children in town wherever reasonable. Additionally, the town should tie into "National Hurricane Preparedness Week" which is organized by NOAA and, in 2012, ran from May 27th to June 2nd. Tying into national hazard educational weeks sponsored by governmental agencies increases the availability of information to the town, decreasing the amount of funds and resources the town needs to allocate towards such cause.

Many potential mitigation measures for hurricanes and tropical storms include those appropriate for inland and coastal flooding. These were presented 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 along with specific mitigation measures addressing the effects of heavy winds that are inherently caused by hurricanes.

6.0 SUMMER STORMS AND TORNADOES

6.1 Setting / Historic Record

Similar to hurricanes, tropical storms and winter storms, wind damage associated with summer storms and tornadoes has the potential to affect any area of Griswold. 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 town without harming another. Such storms occur in Griswold each year, although hail and direct lightning strikes to areas within Griswold are rarer. No tornadoes have occurred within the town since the last HMP.

The following is an excerpt from the NCDC database for recent summer storms that impacted Griswold:

- On July 2, 2008, an upper level disturbance produced hail reportedly up to 1.25 inches in diameter and severe wind gusts in southeastern Connecticut.
- On June 26, 2009, supercell thunderstorms formed and tracked across southern Connecticut. Penny size hail was reported in neighboring Lisbon.
- On July 20, 2015 an isolated severe storm cause damage to trees and wires at 5 Lincoln Square in Jewett City.

Additionally, Griswold staff and the National Weather Service report a microburst hit Town in June, 2015, taking down numerous trees.

6.2 Existing Capabilities

Warning is the most viable and therefore the primary method of existing mitigation for tornadoes and thunderstorm-related hazards in Connecticut. The NOAA National Weather Service issues watches and warnings when severe weather is likely to develop or has developed, respectively.

The state has provided NOAA weather radios to all public schools as well as to many local governments for use in public buildings. The general public continues to rely on mass media for knowledge of weather warnings. Warning time for tornadoes is very short due to the nature of these types of events, so pre-disaster response time can be limited. However, the NOAA weather radios provide immediate notification of all types of weather warnings in addition to tornadoes, making them very popular with communities. These warnings include lightning, thunderstorms, and hailstorms.

NOAA radios are stations at the Public Works building. The Griswold First Selectman sends out public emails to residents warning of impending severe weather.

Griswold has a full time tree warden and an as-needed program for tree trimming. The Public Works Department has equipment to clean up downed tree limbs and brush following major

wind events. Depending on the scale of the damage, the town can employ an outside contractor to assist in tree limbs and brush removal following a major wind event.

Summary

In general, municipal capabilities to mitigate thunderstorm and tornado damage have not increased significantly since the 2012 edition of the hazard mitigation plan was adopted, with the exception of changes in tree maintenance described in Chapter 5.

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 Griswold are equally likely to experience the effects of summer storms. Tornadoes are far less frequent than less powerful summer storms and, although they can cross all areas of town, Griswold is not likely to experience a tornado in any given year.

Most thunderstorm damage, typically associated with summer storms, 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 cable 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 and widespread power outages. Such fires can be extremely dangerous during the summer months, especially during dry and drought conditions. Downed trees affecting utility structures are of great concern to Griswold, especially during dry and drought conditions as not all utilities are located underground.

Lightning and hail are generally associated with severe thunderstorms and can produce damaging effects. All areas of 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. These are considered likely events each year, but typically cause limited damage within. Most buildings within town are sufficiently constructed and meet current building codes.

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 Connecticut. Thus, while the possibility of a tornado striking Griswold exists, it is considered to be an event with a very low probability of occurrence.

6.4 Mitigation Strategies and Actions

Public education, warning and comprehensive annual tree maintenance are the best techniques to mitigate damage from hail, lightning, and tornadoes. 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 Griswold.

7.0 WINTER STORMS AND NOR'EASTERS

7.1 Setting / Historic Record

Similar to summer storms and tornadoes, winter storms have the potential to affect any part of Griswold. However, unlike summer storms, winter events and the hazards that result (wind, snow, and ice) have more widespread geographic extent. The entire town is therefore susceptible to winter storms. 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 Griswold since the last HMP. During the winter of 2011, when the region received record-breaking snowfall amounts, Griswold assessed all flat-roofed buildings. The Pachaug Town Hall, which is now a historic building that is primarily used as a meeting space, was temporarily closed due to snow load concerns. Town employees did not perform any shoveling of roofs during the season. Griswold High School is outfitted with a structural monitoring system that monitored snow loading on the roof, and noted that the load reached a critical status. There were a small number of residential failures and a few mobile home roofs that were damaged.

- Winter storm Alfred in October 2011 led to downed trees and electrical outages in different areas of town, which was attributed partly to wind damage rather than snow load damage.

- On January 31, 2013, a strong winter storm damaged trees in Jewett City. Although the precipitation fell as mostly rain, the high winds of 60-70 miles per hour cause extensive tree damage throughout the area.

- Heavy snow from two storms impacted the region in February and March 2013. Several feet of snow fell between the two storms, taxing the town's snow removal abilities. The town received approximately $50,000 to cover expenses related to the storms.

- Large quantities of snow over the winter of 2015 caused the roof of a chicken coop to collapse, as well as an old farm house. Neither was owned by the Town. FEMA funding was reportedly granted to the Town for recovery efforts.

7.2 Existing Capabilities

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.

As it is almost guaranteed that winter storms will occur annually in Connecticut, it is important for municipalities to 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. Collectively, the Connecticut DOT and the Griswold Public Works Department (PWD) conduct the majority of plowing in Griswold. The Connecticut DOT plows the state routes as well as Interstate 395 in town, while Griswold PWD takes care of all municipal roads. Private roads are not plowed by the town. The PWD has set plowing routes and maintain a supply of sand and salt.

Since the previous HMP, the Town has upgraded much of its snow-management equipment, including the purchase of high-output plows. These upgrades have been paid for using the Town budget. The Town's capability and reliability with regard to road clearing has improved, as evidenced by positive feedback from Town residents.

The town must ensure that all warning/notification and communications systems are ready before a storm and ensures that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order. There are a few steep roads in Griswold including Norman Road which is a historic road where drivers have historically become stranded. The application of additional sand and salt typically suffices to improve access. The Town continually assesses areas that are difficult to access during winter storm events to ensure it is able to access all areas.

The Connecticut Building Code specifies that a weight of 30 pounds per square foot be used as the base "ground snow load" for computing snow loading for different types of roofs. After the roof collapses of 2015, the Town developed a new roof-clearing policy that focuses on removing snow from the backside of the Senior Center and from the roofs of the Dog Pound Kennels to avoid collapse.

The Fire Department and the Senior Center administration check on homeless people during severe cold weather events.

Summary

In general, municipal capabilities to mitigate snowstorm damage have increased significantly since the 2012 edition of the hazard mitigation plan was adopted. This is because the Town continues to experience heavy snow each winter, and has allocated resources to address the risks.

7.3 Vulnerabilities and Risk Assessment

This section focuses on those effects commonly associated with winter storms, including those from blizzards, ice storms, heavy snow, freezing rain, and extreme cold. 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. Often, tree limbs on roadways are not suited to withstand high wind and snow or ice loads. Secondary effects can include loss of power and heat. Further "flood" damage could be caused by flooding from frozen water pipes.

Severe winter storms can produce an array of hazardous weather conditions, including heavy snow, blizzards, freezing rain and ice pellets, flooding, heavy winds, and extreme cold. Town officials note that very few areas are difficult to access during the winter. In addition, Town officials report that there have been no historical ice jam issues on the Pachaug or Quinebaug Rivers.

7.4 Mitigation Strategies and Actions

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 3.4 of this annex. 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. General recommendations pertinent to all natural hazards that could affect Griswold are listed in Section 11 of this annex. General and specific measures pertinent to reducing damage from winter storms on the town are listed in Section 11 under the categories of prevention, property protection, emergency services, public education and awareness, natural resource protection, and structural projects.

8.0 EARTHQUAKES

8.1 Setting / Historic Record

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 Griswold. However, it is very unlikely that the town would be at the epicenter of such a damaging earthquake. No major earthquakes have affected Griswold since the last HMP.

8.2 Existing Capabilities

The Connecticut Building Codes include design criteria for buildings specific to each municipality as adopted by BOCA. These include the seismic coefficients for building design in Griswold. The town has adopted these codes for new construction, and they are enforced by the Town Building Official.

Due to the infrequent nature of damaging earthquakes, land use policies in Griswold do not directly address earthquake hazards.

Critical Facilities in Griswold have extra supplies in case of loss of utilities or travel capabilities. Fire Companies (which are also emergency shelters) have extra food to feed public works employees and other responders during emergency events.

Summary

In general, municipal capabilities to mitigate earthquake damage have not increased since the 2012 edition of the hazard mitigation plan was adopted. This is because the hazard continues to pose a low risk of damage to the Town and Borough.

8.3 Vulnerabilities and Risk Assessment

Unlike seismic activity in California, earthquakes in Connecticut are not associated with specific known active faults. Bedrock in Connecticut and New England in general is highly capable of transmitting seismic energy.

The built environment in Connecticut includes old, non-reinforced masonry that is not seismically designed. Those who live or work in non-reinforced masonry buildings, especially those built on filled land or unstable soils are at the highest risk for injury due to the occurrence of an earthquake. 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.

Approximately 1,082 acres out of approximately 23,652 total acres or approximately 5% of the town is underlain by sand and gravel (including alluvium, sand, gravel, fines, swamp, surficial materials beneath surface water, and artificial fill). Structures in these areas are at increased risk from earthquakes due to amplification of seismic energy and/or collapse. The best mitigation for future development in areas of sandy material is the application of the most stringent building codes such as those in the Connecticut Building Codes or, wherever the town deems necessary, the prohibition of new construction. The areas that are not at increased risk during an earthquake due to unstable soils are the areas underlain by glacial till.

Areas of steep slopes can collapse during an earthquake, creating landslides. Seismic activity can also break utility lines, such as water mains and 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.

A complete *HAZUS-MH* analysis of the region for earthquake damage is detailed in the Regional Plan. 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 Mitigation Strategies and Actions

Due to the low probability of occurrence, potential mitigation measures related to earthquake damage primarily include adherence to building codes, emergency response services, and the placement of utility infrastructure underground. 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. The pertinent recommendations to Griswold are reprinted 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 lightly developed areas. Griswold routinely experiences minor brush fires.

9.2 Existing Capabilities

Monitoring of potential fire conditions is an important part of mitigation. The DEEP Forestry Division uses the rainfall data recorded by the Automated Flood Warning system to compile forest fire probability forecasts. This allows the DEEP and Griswold to monitor the drier areas of the state to be prepared for forest fire conditions. The town can access this information on the internet.

Existing mitigation for wildland fire control is typically focused on Fire Department (entirely volunteer) training and maintaining an adequate supply of equipment. The Department moves to the location of the fire as quick as possible. The Griswold and Jewett City Fire Departments have Mutual Aid agreements with surrounding Towns to coordinate fighting blazes larger than a single Town can manage; additionally, the CT DEEP often assists with wildland fire fighting in Griswold because of the large amounts of State land in the Town.

The public water service in the Borough and parts of Griswold is provided by Jewett City Water Company, a subsidiary of the Hazardville Water Company. The water system has 23 fire hydrants outside of the Borough. The Fire Department has an additional 14 dry hydrants throughout town and has the ability to draft water from various streams, ponds, and river. The Department has two brush trucks and a gator to access off-road fires.

Since the previous HMP, four new dry hydrants have been installed in areas of Griswold not served by municipal water:

- On Route 165
- At the Glasgow Dam
- On Rixtown Road
- On Pachaug Lake at the Shooting Range

The Connecticut DEEP has recently changed its Open Burning Program. It now requires individuals to be nominated and designated by the Chief Executive Officer in each municipality that allows open burning and to take an online training course and exam to become certified as an "Open Burning Official." Griswold has designated it Fire Marshal as the Open Burning Official. Permit template forms were also revised that provide permit requirements so that the applicant/permittee is made aware of the requirements prior to, during, and after burn activity. The regulated activity is then overseen by the Town.

Summary

In general, municipal capabilities to mitigate wildfire damage have increased since the 2012 edition of the hazard mitigation plan was adopted, including mutual aid agreements, dry hydrant installations, and changes in the State's regulation of open burning.

9.3 Vulnerabilities and Risk Assessment

The forest areas in Griswold are the highest risk areas for fires. In many areas, structures and subdivisions are built abutting forest borders, creating areas of particular vulnerability. Wildfires are more common in rural areas than in developed areas as most fires in populated areas are quickly noticed and contained. There have been a couple of 100-acre fires over the past 30 years. The exact dates of these fires are unknown. The town has a handful of brush fires each spring and autumn. Yet, the largest fires burn a maximum of one to two acres.

9.4 Mitigation Strategies and Actions

Potential mitigation measures for wildfires include a combination of prevention, education, and emergency planning 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.

The risk of a dam failure affecting Griswold is considered to be moderate as the town has seven known dams classified equal to or higher than Class B (this is a change from the previous HMP, at which time only six dams in Griswold were classified as equal to or higher than Class B; City Pond Dam has been added to the list by CT DEEP). According to town officials, there are no known historical failures causing damage in Griswold.

10.2 Existing Capabilities

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. Dam Inspection Regulations require that nearly 700 dams in Connecticut be inspected annually. The DEEP currently prioritizes inspections of those dams that pose the greatest potential threat to downstream persons and properties.

Dams found to be unsafe under the inspection program must be repaired by the owner. Depending on the severity of the identified deficiency, an owner is allowed reasonable time to make the required repairs or remove the dam. If a dam owner fails to make necessary repairs to the subject structure, the DEEP may issue an administrative order requiring the owner to restore the structure to a safe condition and may refer noncompliance with such an order to the Attorney General's Office for enforcement. As a means of last resort, the DEEP Commissioner is empowered by statute to remove or correct, at the expense of the owner, any unsafe structures that present a clear and present danger to public safety.

In Connecticut, the owners of Class C dams are required to maintain EAPs. According to Connecticut DEEP Dam Safety files, a dam failure analysis was available for the Glasgo Pond Dam, Ashland Pond Dam, Pachaug Pond Dam, and Aspinook Pond Dam as shown on Figure 10-1. Dams with an EAP on file at the same location include the Saw Mill Pond dam, Stone Hill Reservoir Dam, Ashland Pond Dam, and Pachuag Pond Dam.

The Griswold Emergency Manager monitors dams and the status of their EAPs. The Town also reports to the CT DOT on the state of scour-critical bridges; often bridge and dam inspections are performed simultaneously.

Griswold is attempting to have the State take over ownership of the Carroll Row Dam.

Summary

In general, municipal capabilities to mitigate dam failure damage have not increased significantly since the 2012 edition of the hazard mitigation plan was adopted. However, changes in the State's regulation of dams have increased Statewide capabilities sharply.

10.3 Vulnerabilities and Risk Assessment

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. According to the "Connecticut Dams" GIS data file that was published in 1996, there were 20 DEEP-registered dams within Griswold, of which nine were Class A, two were Class BB, three were Class B, and three were Class C. High and significant hazard dams in Griswold are listed in Table 8-1. This HMP section primarily discusses the possible effects of failure of both high potential hazard (Class C) dams and significant hazard (Class B) dams.

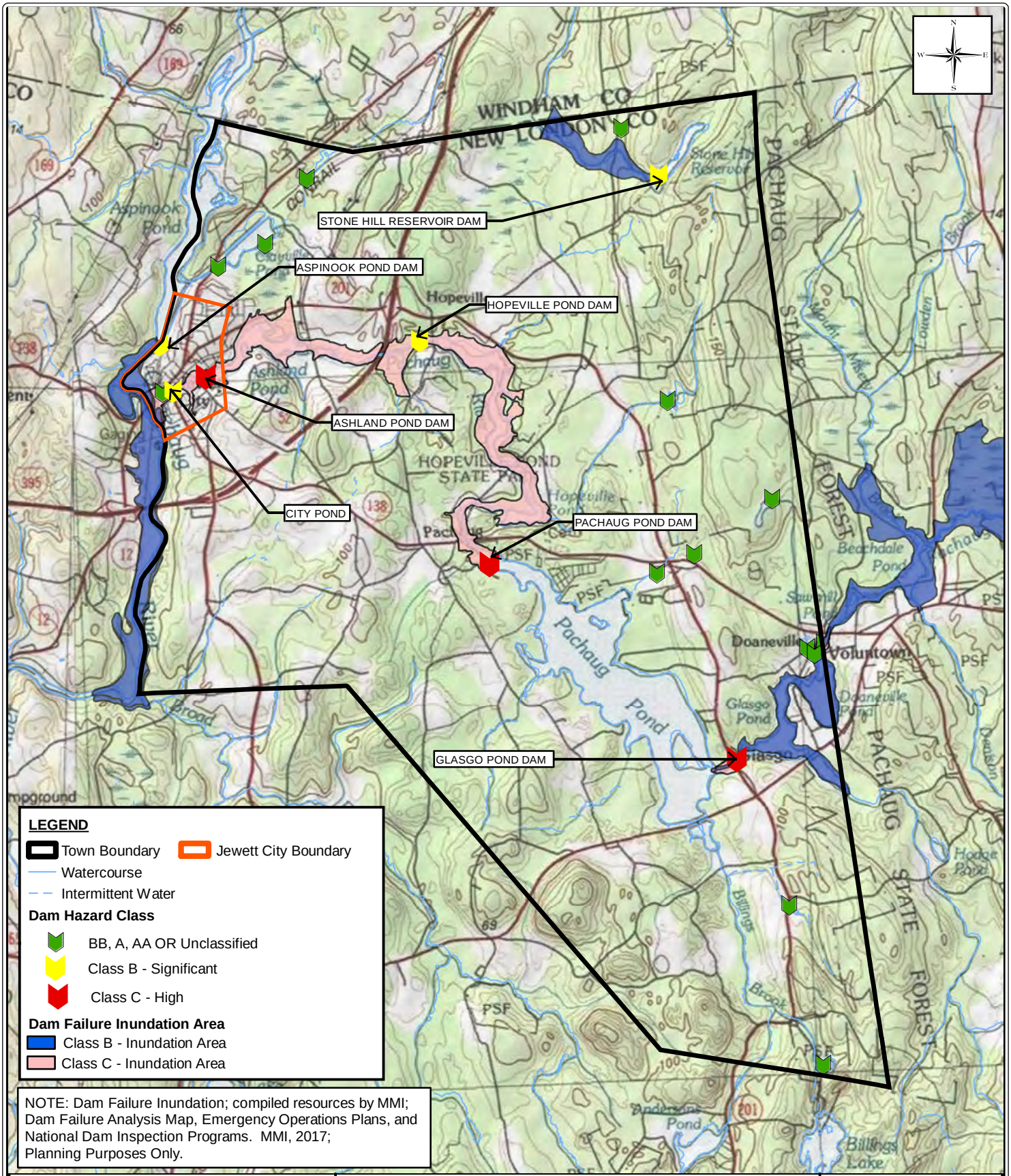
TABLE 10-1
Dams Registered With the DEEP in the Town of Griswold

Number	Name	Owner	Class
5801	Glasgo Pond Dam	CT DEEP	C
5802	City Pond	CT DEEP	B
5803	Stone Hill Reservoir	Jewett City Water Company	B
5804	Ashland Pond	CT DEEP	C
5805	Pachaug Pond	CT DEEP	C
5807	Hopeville Pond Dam	CT DEEP	B
5811	Aspinook Pond	Private (Commercial)	B

Failure of a Class C dam would result in any of the following: loss of life; major damage to habitable structures, residences, hospitals, convalescent homes, schools, and main highways; and a significant economic loss. Failure of a Class B dam failure would result in any of the following: possible loss of life; minor damage to habitable structures, residences, hospitals, convalescent homes, and schools; damage or interruption of the use of service of utilities; damage to primary roadways and railroads; and a significant economic loss. Both hazard classes of dams are regarded as significant in the state of Connecticut.

The impacts related to the Class C and Class B dams in Town are described below. The description below is based on information available at the Connecticut DEEP Dam Safety Section. It is noted that the failure of any of the other dams in Town could also have impacts on human life and property within Griswold although these are not discussed in favor of the higher classes.

MXD: Y:\3570-09\Maps\annex_maps\Griswold\Figure 10-1.mxd



LEGEND

- Town Boundary
- Jewett City Boundary
- Watercourse
- Intermittent Water

Dam Hazard Class

- BB, A, AA OR Unclassified
- Class B - Significant
- Class C - High

Dam Failure Inundation Area

- Class B - Inundation Area
- Class C - Inundation Area

NOTE: Dam Failure Inundation; compiled resources by MMI; Dam Failure Analysis Map, Emergency Operations Plans, and National Dam Inspection Programs. MMI, 2017; Planning Purposes Only.

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HIGH & SIGNIFICANT HAZARD DAMS

SCCOG HAZARD MITIGATION UPDATE
TOWN OF GRISWOLD ANNEX

GRISWOLD, CONNECTICUT

SOURCE: DAM HAZARD CLASS; DAMS, CTDEEP 1996 & LISTING OF DAMS; CTDEEP, 2016

DATE: **JULY 26, 2017**		
SCALE: **1"=6,000 '**		
PROJ. NO.: **3570-09**		
DESIGNED **SB**	DRAWN **PS**	CHECKED **DM**

DRAWING NAME:

FIG. 10-1

- Glasgo Pond Dam (No. 5801) is a Class C dam located on the Pachaug River at the western end of the Glasgo Pond, adjacent to Glasgo Road (State Route 201). According to a 1977 CT DEEP inspection, the dam is a stone masonry and earth structure formerly used to supply e power and process water to a mill. A stone masonry overflow weir is located at the right abutment. The outlet works is located in the left section of the dam and is comprised of three sluice gates. The dam has a length of 100 feet, a height of 25 feet, four-foot high abutments, and a stone-faced spillway with a length of 95 feet and a height of 20 feet. The dam impounds a pond with a surface area of 184 acres, watershed of 38 SM and provides 1,800 acre-feet of storage. The pond cannot be lowered in an emergency. The pond is used for recreational purposes and for irrigation in a state forest nursery. A DFA was completed by Lenard & Dilaj Engineering, and utilized a ½ PMF storm. The analysis predicted that the pond would overtop the left embankment by 1.2 feet, and that the spillway only had the capacity to convey the 100-year discharge. A new outlet control structure was constructed in 1980. In April 1970, high water in the pond caused residents below the dam to evacuate.

  This dam is currently undergoing rehabilitation. Headworks for overflow have been redone, and new top was constructed on the dam.

- City Pond Dam (No. 5802) is a Class B according to the CT DEEP's 2016 inventory; previously this dam had not been included in the State's list of high and significant hazard dams. The dam is located on the Quinebaug River just upstream of Slater Avenue. It is about 500 feet upstream of the United Pond Dam. The hazard class upgrade of this dam represents a n elevated risk in Town.

- Stone Hill Reservoir Dam (No. 5803) is a Class B dam located 2.4 miles northeast of the village of Hopeville and 4.9 miles northeast of Jewett City. The dam is located at the southwest end of the reservoir, and the spillway is located 700 feet south of the dam. According to the April 1980 Phase II Report by Lenard & Dilaj Engineering, Inc., the dam was originally constructed in 1894. The reservoir acts as a standpipe for the Jewett City Water Company, providing 1 MGD to the utility, transmitted by four miles of cast iron main. There is no recreation permitted on the reservoir. A watershed of 0.81 SM drains to the Quinebaug River basin by way of the Reservoir Brook from the spillway. The brook flows west to Mill Brook to a large swampy area. Reservoir Brook is approximately 1.5 miles long.

  The Stone Hill Reservoir has a surface area of 28.2 acres, is 3,200 feet long and has an average depth of 15 feet. The reservoir depth is 20 feet at the outlet structure. The dam is an earthen embankment structure with a masonry core wall. The dam has a length of 500 feet, a height of 22 feet, a width of 18 feet at the crest and a width of 100 feet at its base. The 1980 Phase II report includes an EAP and Operations Manual. A dam breach flood delineation map was created in 1988 based on a ½ PMF equal to 1,575 cfs. Construction was completed in 1993 on a new emergency spillway, new spillway discharge channel and concrete block wave wall in response to a review by the CT DEEP indicating wave heights of up 1.7 feet could be generated and that the emergency spillway and dam should be raised.

- Ashland Pond Dam (No. 5804) is a Class C dam located in Jewett City at the western end of the linear Ashland Pond on the Pachaug River 3,000 feet upstream of the confluence with

the Quinebaug River. The shallow pond has a watershed area of 62.6 SM, surface area of 101.7 acres, and maximum storage of 1,235 acre-feet. The dam was constructed in 1864 to provide water power for the United Merchants and Manufacturing Company mill and was purchased by the state in 1984. The pond was used for cooling water by Triangle Plastic Wire & Cable Company but is not purely recreational. The mill has since burned down and the Triangle Company has closed.

According to the 1985 Phase II Engineering Report by Roald Haestad, Inc., the dam is an earthen embankment with a stone masonry overflow spillway and concrete outlet structure with stone masonry headrace. The intake structure discharges to an abandoned intake bay and a riveted iron penstock. The dam has a length of 260 feet, a height of 25 feet, and a crest width of 10 feet. The spillway has a length of 113 feet and a height of 20 feet. The intake structure is comprised of three timber gates with trash racks. The timber gate on the downstream side controls the flow to an eight-foot diameter iron penstock that discharges to the turbine. The spillway is a broad crested stone masonry weir with a length of 113 feet, and located seven feet below the top of the dam. The left abutment area is lawn for two multi-family houses which are slightly protected from overflow with a small berm.

The pond has a surface area of 100 acres and a watershed of 62 SM. A DFA was completed which analyzed failure effects from a ½ PMF of 23, 241 cfs. The inundation mapping was included in the June 1979 USACE Phase I inspection. An EOP was created in April 1985 by Haestad Inc. and an Operations and Maintenance Manual was published by the CT DEEP in March 1999. Rehabilitation of the dam was completed in 1997. A General Permit for Dam Safety Repair and Alteration was issued by the CT DEEP on August 9, 2011 to address damage from the March 29-30, 2011 flood event. The storm displaced stone from the spillway. Riprap has since been added to the dam.

- Pachaug Pond Dam (No. 5805) is a Class C dam located on the Pachaug River two miles east of I-395 and 0.5 mile east of Bethel Road. Inflow to the pond is from the Pachaug River and its tributaries. According to a General Permit for Dam Safety Repair and Alteration dated August 2011, the pond has a watershed of 52.3 SM, a surface area of 831 acres, and is impounded on the west side by a an earthen dam with a height of 17 feet, length of 630 feet, and a 121-foot stone masonry straight drop spillway. The 2011 permit requested permission to move displaced riprap from the March 29-30, 2010 flood, complete grading repairs to the downstream embankment, clear brush, and repair a chain-link fence. A DFA was completed by Haestad in May 1981 and an Operations and Maintenance Manual was completed in August 1982. A 1982 and 1985 EOP by Haestad are also on file with the CT DEEP, along with a 1983 Phase II Engineering Report.

  This dam is currently undergoing improvement work.

- Hopeville Pond Dam (No. 5807) is a Class B dam located on the Pachaug River at the western end of Hopeville Pond. According to the 1985 Phase II report by Roald Haestad Inc., the dam is an earthen embankment with a centrally located concrete spillway and two outlet structures. The dam is a length of 480 feet, a height of 19 feet, a crest width which varies from 10 to 20 feet, and a spillway five feet lower than the crest elevation. The Hopeville

Pond has a surface area of 122 acres, a length of 12,000 feet, a 60 SM watershed, and provides 590 acre-feet of storage. The Phase II noted that improvements should be made that would reduce the dam to a low hazard classification, specifically widening the embankments to 20 feet, installing riprap erosion protection and constructing a concrete training wall. The dam failure analysis indicated that there would be no loss of life and minimal property damage. The failure of the Hopeville Pond Dam could cause failure of the downstream Ashland Pond dam if the recommended improvements were not implemented. An Operations and Maintenance Manual was produced by Roald Haestad in April 1985. Based on file research, it appears that these modifications were completed in or around 1989.

- Aspinook Pond Dam (No. 5811) is a Class B dam owned by Summit Hydropower and located on the Quinebaug River, 7.8 miles upstream of the confluence with the Shetucket River and 0.9 miles upstream of the confluence with the Pachaug River. According to the 1979 USACE report, the dam is a run-of-the-river structure constructed in 1913 for manufacturing processes and electrical power for a mill south of the dam. The dam supplies cooling and fire protection water to Wyre Wynd Plant at the original mill site. The structure has a long straight overflow section 473 feet long of grouted rubble masonry with a concrete crest. A structure with firefighting pumps is located at the east side of the forebay. The dam has a height of 21.5 feet and provides a maximum storage of 7,450 acre-feet. The watershed to the pond is 668 SM.

  A DFA was completed in 1979 that used a flow of 49, 500 cfs. In the 4000-foot reach downstream of the dam, significant property damage could take place if failure occurred. The industrial Wyre Wynd Company is located downstream, as well as seven homes on the left bank, one home on the right bank, and a wooden trestle bridge with a water main crossing just upstream of the Route 138/201 intersection. Minor flooding of the Penn Central Railway could occur.

  Work has been done to improve the hydropower operations at this dam since the previous HMP.

Griswold does not own any dams; however it does have concerns about the CT DEEP-owned dams on the Pachaug River. The town feels that the CT DEEP should lower the water behind the dams each spring. Griswold has contacted the State of Connecticut about release and storage information but the State of Connecticut has not been forthcoming with the information. In summary, the town would appreciate having a comfort level if severe rainfall occurs similar to the March 2010 flood.

The Saw Mill Pond Dam, located upstream on the Pachaug River in Voluntown, is privately owned. It is essentially a run-of-the-river dam with minimal storage. This dam had some erosion of the berm in March 2010 due to overtopping. The Saw Mill Pond Dam has an EOP on file with the CT DEEP which states that if the dam were to fail, there would be a four foot rise in downstream water levels for four hours. The Cross Road Dam downstream from the Voluntown Saw Mill Dam experienced scour in March 2010.

Coordination of releases upstream of Griswold on the Pachaug River is a concern for the town. The basin stretches into Rhode Island and many dams are present along this reach of the river. Flows can be extremely variable which can be dangerous during higher water periods.

Griswold will need to address the addition of City Pond Dam to its list of significant and high-hazard dams. Information about dam failure and an EAP should be obtained as soon as possible.

10.4 Mitigation Strategies and Actions

Several recommendations related to mitigating potential damage to the Town from a dam failure are presented in Section 11.

11.0 MITIGATION STRATEGIES AND ACTIONS

11.1 Status of Mitigation Strategies and Actions

The previous edition of the SCCOG Multi-Jurisdictional HMP and Town of Griswold annex listed a suite of hazard mitigation actions applicable both locally and region-wide. These actions, along with commentary regarding the status of each, are listed in the tables in this section. Additionally, new actions were developed in the process of developing this HMP update. These are listed at the end of each hazard section below.

11.1.1 Actions Applicable to All Hazards

Actions Applicable to All Hazards		
Action	**Status**	**Notes**
Regional Coordination		
Continue to promote inter-jurisdictional coordination efforts for emergency response.	*Capability*	*Completed through mutual-aid agreements between the Fire Departments and Public Works and those departments in surrounding Towns, as well as SCCOG regional hazard management initiatives.* *This action is reclassified as a capability.*
Continue to promote local and regional planning exercises that increase readiness to respond to disasters.	*Capability*	*Town participates in regional and statewide exercises.* *The Emergency Manager coordinates three local exercises or trainings per year that address snow, wind, and other hazards.* *This action is reclassified as a capability.*
Continue to evaluate communication capabilities and pursue upgrades to communication and ensure redundant layers of communication are in place within Griswold and with other SCCOG communities, New London County, and the State of Connecticut.	*Capability*	*Performed by Fire Marshal and Town Planner.* *The fire department has added a new frequency to its radio communications, allowing them to incorporate a new radio tower in Voluntown; this action is expected to eliminate "dead zones."* *This action is reclassified as a capability.*
Continue to promote regional transportation planning through SCCOG to balance general transportation, shipping, and potential evacuation needs.	*Capability*	*This action is the responsibility of, and is being performed by, SCCOG. This action is redefined as a regional capability, and is dropped.*
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.	*Capability*	*This action is the responsibility of, and was performed by, SCCOG. None of the facilities in the analysis were located in Griswold.*
Work with SCCOG to develop regional evacuation scenarios that include but build upon the Millstone evacuation plan.	*Capability*	*This action is the responsibility of, and is being performed by, SCCOG. This action is redefined as a regional capability, and is dropped.*
Local Emergency Response		
Continue to review and update the Griswold EOP at least once annually.	*Capability*	*Performed by Fire Marshal (Emergency Manager)* *This action is reclassified as a capability.*
Add the HMP update as an annex to the town EOP.	*Delisted*	*The Town will ensure this HMP is available to Town personnel and the public. Adding it as an appendix to the EOP is not necessary.* *This action is dropped.*

Actions Applicable to All Hazards		
Action	**Status**	**Notes**
Continue to pursue funding for a town-wide Reverse 911 program such as the State of Connecticut's Alerts "Everbridge" System.	*Capability*	
Continue to maintain emergency response training and equipment and upgrade equipment when possible. Emergency response training and equipment shall continue to be ongoing and part of the weekly Fire Department training. Access to the Connecticut Eastern Region Response Integrated Team (CERRIT) will remain.	*Capability*	*Performed by Fire Marshal and Fire Departments. This action is reclassified as a capability.*
Encourage Griswold officials to attend FEMA-sponsored training seminars at the Emergency Management Institute (EMI) in Emmitsburg, Maryland.	*Capability*	*Staff attend locally-held seminars and participate in on-line trainings, including through Three Rivers Community College. The Town has not had the capacity to send any of its very limited staff to seminars at EMI.* *Staff attendance of local and online trainings is an ongoing policy and considered sufficient for the Town's needs.* *Travel to EMI is dropped.* *Local and online training attendance is reclassified as a capability.*
Continue to evaluate emergency shelters, update supplies, and check communication equipment.	*Capability*	*Performed by Fire Marshal*
Pursue ARC certification of A. A. Young Jr, Hose and Ladder Company No. 1 (Jewett City Fire Department, Station 56) which has a capacity of 75 people and the Griswold Elementary School which has a capacity of approximately 400 people in the gymnasium.	*Capability*	*Griswold is confident of the quality of its shelters and so this action has not been a top priority. The Town regularly evaluates its shelters and their supplies.*
Continue to promote dissemination of public information regarding natural hazard effects and mitigation measures into local governmental and community buildings.	*Capability*	*Guides and information is available at the Town Hall and the Fire Department. Public notices and public health and safety notices specifically are posted to the main page of the Town website.* *Part of the Main Street Master Plan was to construct an information kiosk outside Town Hall. State funding for the plan was insufficient, and the plan is not being further pursued. The kiosk was not built.* *A new action related to public education and communication is listed after this table.* *Ongoing public education, outreach, and communication efforts are classified as a capability.*
<u>Prevention</u>		
Form a committee to review planning documents and regulations in the Planning and Community Development Office and integrate appropriate elements of this HMP into those planning documents.	*Carry Forward*	*The POCD was not updated in the timeframe of the 2012 HMP, so this action is carried forward to the pending POCD update.*

Actions Applicable to All Hazards		
Action	**Status**	**Notes**
Utilize cell phone and social media following a forecasted significant weather event for the town to increase options of information streams to residents and businessmen and women in addition to television and radio. Consider packaging alerts through a single service to allow the simultaneous broadcast of information across all applicable platforms. (e.g. text messages and social media)	*Capability*	*The Griswold Fire Department and Selectman's Office (as well as other offices and departments) operate a number of different facebook pages and pages on other social media outlets. Hazard and emergency alerts are posted on these pages. This aspect of this action is reclassified as a capability. Alerts have not been packaged into a single service due to a lack of local expertise and funding. Current social media outreach efforts are deemed sufficient at this time. This aspect of this action is dropped. A new action related to public education and communication is listed after this table.*
Identify locations and move forward with the pursuit of funding for the POCD's recommendation to add Fire Department substations in areas not adequately served by the existing Fire Stations.	*Capability/ Carry Forward*	*The Fire Department has not felt this cost-effective to pursue in the past, however the ISO is encouraging the Town to construct a substation near the intersection of routes 165 and 201. The Town's ISO rating went from 10 to 8B in February, providing great cost-savings to residents. The Town is interested in lowering that score again. This action is carried forward.*
Continue reviewing building plans to ensure proper access for emergency vehicles.	*Capability*	*Performed by the Building Official. This action is reclassified as a capability.*
Continue to require the burying of utility lines wherever logical.	*Capability*	*Buried utility lines are required for new development. This action is reclassified as a capability.*
Continue to enforce the appropriate building code for new building projects and exceed code design when possible. Review the enforceability of new buildings per the CT Building Codes, especially per wind specifications.	*Capability*	*Performed by the Building Official. This action is reclassified as a capability.*
Encourage Griswold residents and businesses to install and maintain lightning rods on their buildings.	*Delisted*	*The Town has not seen strong evidence that installation of lightning rods on private residential property will be helpful. Additionally, there is little access in this area to companies capable to performing such installations.*
Review the SCCOG Evacuation Plan and consider composing a town-wide Plan.	*Delisted*	*Evacuation procedures included in regional plans and the local EOP are deemed sufficient. This action is dropped.*

New actions or strategies developed during the HMP update include:

- ❑ Collaborate with telecommunications companies to utilize the Norman Road Radio Tower to improve emergency communications between Town personnel.
- ❑ Coordinate with Wolverine Radio to display relevant hazard information (on a seasonal or event-specific basis) on Wolverine Radio screens located in Town Hall and other locations around Town.
- ❑ Develop a coordinated emergency communication plan that allows the Town to broadcast alerts through Wolverine Radio, Wolverine Radio's visual displays, the parent-communication system of the public school, and the Baptist Church belltower Public Address system.

- ❑ Support the Avalonia Land Conservancy's acquisition of 74 acres of land in Griswold as part of the "Tri-Town Forest" property

11.1.2 Actions Applicable to Inland Flooding

Actions Applicable to Inland Flooding		
Action	**Status**	**Notes**
Continue to prohibit new development activities within SFHAs to the greatest extent possible within the Griswold land use regulations.	*Capability*	*Accomplished through Town Ordinance, Zoning and Subdivision regulations, and permitting procedures. This action is reclassified as a capability.*
Make available FEMA-provided flood insurance brochures at public accessible places such as the Fire Departments, local government buildings, and the Slater Library. Encourage residents to purchase flood insurance if they are located within a FEMA SFHA.	*Capability*	*Emergency Manager has brochures relevant to specific types of hazards, which he puts out at appropriate times of year. Locations for brochures at the Town Hall Lobby and the Fire House. Information packets are also available to residents that contact the Town after an event This action is reclassified as a capability.*
Continue to regulate development in protected and sensitive areas, including floodplains, steep slopes and sites associated with wetlands. Wherever necessary, prohibit development in these areas.	*Capability*	*Accomplished through Town Ordinance, Zoning and Subdivision regulations, and permitting procedures. This action is reclassified as a capability.*
Utilize recently available extreme rainfall data to determine existing sizing of culverts. Encourage bridge replacements and culvert replacements in areas found to be undersized such as the drainage system on Sheldon Road.	*Carry Forward / New*	*It appears that extreme rainfall data is used for some projects, but the procedure is not be formalized. This action is dropped and replaced with that listed below this table.*
Continue to perform catch basin and culvert surveys each spring by the Public Works Department to determine the need for maintenance and cleaning and to identify and prioritize structures in need of replacement or upgrades.	*Capability*	*DPW annually cleans catch basins & culverts, and upgrades those that are failing. This action is reclassified as a capability.*
Pursue acquisitions or elevations of the two residences on Mill Road which each had up to six feet of water inundation in the basements during the March 2010 storms.	*Delisted/ Revised*	*Town is pursuing removal of Rubber Pond dam downstream from the floodprone Mill Street property. It is hoped that this action will relieve flooding issues and make other actions unnecessary*
Pursue HMGP funding to construct a flood wall around the WWTP to resolve inundation issues.	*Carry Forward / Modify*	*Wastewater Treatment Facility floodwall exists but was circumvented by floodwaters in 2010; it does not extend far enough toward Wedgewood Road to prevent flooding. Town previously applied for funding but FEMA did not grant funding for an extension of the wall. Town will continue to pursue extension of this wall. This action is carried forward as "Extend Wastewater Treatment Facility floodwall toward Wedgewood Road to prevent floodwaters from circumventing the existing wall and inundating the plant."*
Work with the owners of the Lakeview Mobile Home Park on Sheldon Road to pursue funding for acquisitions, elevations or relocations of the units as they were subject to inundation during the March 2010 rain events and were difficult to access via emergency vehicles.	*Delisted*	*No owners have expressed interest in pursuing Town acquisition or relocation of their properties. This action is dropped.*

Actions Applicable to Inland Flooding		
Action	**Status**	**Notes**
Pursue the funding of the acquisition of a floodprone property on Popple Bridge Road or a drainage system upgrade to the road as the property has repeatedly been subject to flooding and was subject to significant flooding during the March 2010 rainstorms.	*Delisted*	*An easement has been placed on the floodprone property on Popple Bridge Road through eminent domain to alleviate flooding and allow the installation of improved drainage infrastructure.* *It is further hoped that removal of the* *This action is complete.*
Pursue funding to elevate/replace bridges which have been historically prone to scouring including Edmond Road over the Pachaug River, Bitgood Road over Hopeville Pond (Patchaug River), Norman Road over the Patchaug River, and Ashland Street over the Patchaug River.	*Complete/ Carry Forward / Modify*	*Both Bitgood Road Bridges and the Edmond Road Bridge have been upgraded.* *This action is complete.* *The Norman Road bridge is scheduled for replacement in 2018. This action is carried forward.* *Replacement of the Ashland Street Bridge is carried forward.* *Sheldon Road and Carol Road bridge replacements or removals are also being pursued by the Town.*
Develop a priority list to pursue funding for the roadways which experienced nuisance flooding during the March 2010 rain events including Cross Road, Mill Road, Sibicky Road, Ashland Street, Lilly Pond Road, South Main Street, Anthony Street, K of C Drive, Wedgewood Drive, Hopeville Road between Monroe and Lake Roads, Burlenson Lane, Brewster Road at Route 164, and Terry Road.	*Capability*	*The Town is continually upgrading roads and their culverts and drainage systems, and has successfully pursued funding for these efforts.* *The DPW is responsible for prioritizing road improvement projects.* *This action is reclassified as a capability*
Work with the CT DOT to review/update the drainage network on Shetucket Turnpike (Route 165) near the bridge area between the ponds which also experienced flooding during the March 2010 rainstorms.	*Delisted*	*This action is the responsibility of, and is being performed by, the State. This action is dropped.*
Pursue funding to expand the Sheldon Road culvert downstream of Carol Road to increase the conveyance of Doanville Brook and resolve the backwater flooding that is impacting the dam beneath the Carol Road bridge and the bridge. The dam below Carol Road (Trailer Park Pond Dam) was installed by an "act of congress" and a substantially lengthy and expensive process would need to be undertaken.	*Complete*	*The Sheldon Road Culvert has been expanded from a single 15-foot culvert to two 18-foot culverts.* *This action is complete.*
Work with the CT DOT to elevate the roadway and/or improve the drainage network to resolve the flooding issue along the stretch of Route 138 which was inundated by three to four feet of water during the flood of March 2010 and was closed for a period of three to five days.	*Delisted*	*This action is the responsibility of, and is being performed by, the State. This action is dropped.*
Pursue funding for the acquisitions or elevations of the approximately 35 condominium units on South Main Street that were flooded during the storm of March 2010.	*Carry Forward*	*This action has not yet been completed.* *This action is carried forward*

New actions or strategies developed during the HMP update include:

- ❑ Develop formalized guidance for culvert and bridge construction and replacement that requires utilization of the most up-to-date extreme rainfall data from http://precip.eas.cornell.edu (update to Zoning Regulations Appendix 1 S:2.1)
- ❑ Replace the bridge on Sheldon Road over Doaneville Pond to 1% annual-chance storm capacity
- ❑ Replace the bridge on Norman Road over Ashland Pond to 1% annual-chance storm capacity
- ❑ Remove the Carol Road Bridge and retire that road
- ❑ Review flood and stream-maintenance ordinances as part of the review of Town ordinances currently underway
- ❑ Conduct a floodplain study to determine the boundary of the floodplain adjacent to the Volunteer Fire Department Station 55; determine whether the boundary is close enough to the building to warrant construction of a flood-prevention retaining wall.

11.1.3 Actions Applicable to Wind Damage from Hurricanes, Tropical Storms, Summer Storms, Tornados, and Winter Storms

Action	Status	Notes
Consider allocating an increase in annual funding for tree-trimming activities, especially on the major town roads such as: Taylor Hill Road/Ashland Street, Pleasant View Street, and Norman Road/Geer Road/Roode Road/Bitgood Road.	*Delisted*	*The Town believes that its tree-trimming capabilities have increased in recent years without an increase to the annual tree-maintenance budget.* *This action is dropped.*
Ensure that communication remains between the Public Works Department and the CT DOT for tree trimming/tree maintenance of State Routes and Interstate 395.	*Capability*	*This action is reclassified as a capability*
Promote the use of functional shutters for older buildings within town to guard against window breakage which can result in structural failure. Investigate funding sources to promote this relatively inexpensive type of retrofitting on a large scale.	*Delisted*	*Window blow-out has not been an issue in the Town, and staff to not feel this is a useful or necessary action.* *This action is dropped.*
Identify a location or locations within town for brush disposal operation for dealing with debris after wind storms. Determine how these trees can be reused within Griswold (chips, firewood, composting) to reduce costs of disposal and exporting.	*Complete/ Capability*	*The Town has designated its transfer station as its primary brush disposal operation site. The State has also designated the field in front of the Public Works department as a brush disposal site.* *The Town performs its own chop-chip activities during storms, and are members of the 15-town incinerator agreement through SCCOG. This agreement includes borrowing equipment.* *This action is complete.* *The Town's brush disposal procedures are reclassified as a capability.*
Consider surveying all town buildings to determine their ability to withstand wind loading, especially those designated as town shelters (both Fire Departments and the Griswold Middle School).	*Delisted*	*The Town feels that conducting such a survey would be cost-prohibitive, and instead monitors buildings and addresses issues on a case-by-case basis.* *This action is dropped.*

Action	Status	Notes
Visit schools and educate children about the risks of natural hazard events and how to prepare for them.	*Delisted*	*The Town feels that any sort of effective educational program would require consistent reinforcement. The time and money needed to perform such a program for children is not available.* *This action is dropped.*
Consider adding tree maintenance and trimming language into regulations wherever possible.	*Carry Forward*	*A review of Town ordinances is currently underway. This action is carried forward.*
Make funding available to the Public Works Department each budget year for clearing snow roads and parking lots and be mindful that clearing snow from roofs may be needed in the future.	*Capability*	*This action is reclassified as a capability*
Provide information for generally protecting residents during cold weather and for mitigating icing and insulating pipes at town residences.	*Carry Forward*	*This is accomplished through postings on the Town website and through its social media outlets.* *The Town wishes to pursue additional methods of distributing this information. This action is carried forward.*
Continue to conduct snow load assessments of all flat-roofed and susceptible buildings of municipal and private homes following heavy snowfall events.	*Capability*	*This action is reclassified as a capability.*
Continue to maintain a supply of sand and salt at the Public Works Department Garage.	*Capability*	*This action is reclassified as a capability.*
Continue to give special attention to the steep roads in town including Norman Road where automobiles have historically been abandoned.	*Capability*	*This action is reclassified as a capability.*
Continue to identify areas that are difficult to access during winter storm events and develop contingency plans for emergency personnel.	*Capability*	*This action is reclassified as a capability.*

Other actions and strategies implemented since the previous HMP include:

- The Town has upgraded its snow removal equipment, including through the purchase of high output plows.
- After the winter of 2015 the Town developed a new roof-clearing policy focused on removing snow from the backside of the Senior Center and from the roofs of the Dog Pound Kennels.

11.1.4 Actions Applicable to Earthquakes

Action	Status	Notes
Ensure that Griswold departments have adequate backup supplies and facilities for continued functionality in case earthquake damage occurs to these buildings where critical facilities are housed.	*Capability*	*The Town has extra supplies in case of such emergencies. Fire Companies (which are also emergency shelters) have extra food to feed public works employees during events.*
Consider requiring new buildings be designed with the possibility of an earthquake built into the plans.	*Capability*	*This is accomplished through Connecticut building code requirements, enforced by the Building Official.* *This action is reclassified as a capability.*
Consider preventing residential development in areas prone to collapse such as at the base of steep slopes or in areas underlain by stratified drift and most prone to liquefaction.	*Delisted*	*No such areas exist in Town.* *This action is deemed unnecessary and is dropped.*

11.1.5 Actions Applicable to Wildfires

Action	Status	Notes
Continue to evaluate fire flows, available water supply, and areas at risk of wildfire within Griswold.	*Capability*	*This is performed by the Fire Departments. This action is reclassified as a capability.*
Continue to maintain a fleet of vehicles with response capability to respond to forest fires. The Griswold Fire Departments maintain two brush trucks and a Gator for access to off-road fires.	*Capability*	*This is performed by the Fire Departments. This action is reclassified as a capability.*
Consider the addition of dry hydrants to the available stock of ample hydrants within the Borough of Jewett City, 23 hydrants outside of Jewett City, and an additional ten hydrants throughout town.	*Complete/ Capability*	*Four new dry hydrants were installed in the last five years at the following locations:* *- Route 165* *- Glasgow Dam* *- Rixtown Road* *- Pachaug Lake @ Shooting Range* *This ongoing effort is reclassified as a capability*
Maintain the Fire Department's ability to draft water from various streams, ponds, and rivers in town.	*Capability*	*This is performed by the Fire Departments. This action is reclassified as a capability.*
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 Fire Marshal's office at the Town, the Slater Library, and both Fire Departments.	*Capability*	*This is performed by the Fire Departments. This action is reclassified as a capability.*
Ensure that provisions of town regulations regarding fire protection facilities and infrastructure are being enforced.	*Capability*	*This is performed by the Fire Marshal and other Town officials. This action is reclassified as a capability.*

11.1.6 Actions Applicable to Dam Failure

Action	Status	Notes
Pursue a relationship with the CT DEEP to coordinate the release of water from the State-owned Pachaug River dams prior to major forecasted precipitation events, such as the storms of March 2010.	*Capability*	*The Emergency Manager coordinates with CT DEEP. This action is reclassified as a capability.*
Work with the Town of Voluntown, the CT DEEP, and the private owner to assess the Saw Mill Pond Dam as it has experienced erosion following the storms in March 2010 and its EOP states that failure would lead to a four foot rise in downstream water levels for four hours.	*Delisted*	*This action is the responsibility of, and is being performed by, the Town of Voluntown and the CT DEEP. This action is dropped from this plan.*
Work with the Town of Voluntown, the CT DEEP, the Rhode Island DEM, and dam owners to conduct a coordination effort between owners of dams on the Pachaug River into Rhode Island for the release of water prior to significant precipitation events.	*Delisted*	*The CT DEEP coordinates any such efforts. This action is dropped from this plan.*

New actions or strategies developed during the HMP update include:

- ❑ Breach and remove the Route 138 / Slater Avenue Dam on the Quinebaug River
- ❑ Breach and remove the dam just downstream on the Quinebaug River
- ❑ Request that CT DEEP take over control of and responsibility for the Carroll Row Dam
- ❑ Remove the Rubber Pond Dams

- ❑ Griswold will need to address the addition of City Pond Dam to its list of significant and high-hazard dams. Information about dam failure and an EAP should be obtained as soon as possible.

11.2 Prioritization of Specific Actions

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

3570-09-n2117-rpt-griswold annex update-adopted.doc

Table 11-1: Mitigation Actions and Strategies for the Town of Griswold and the Borough of Jewett City 2016 - 2021

Action or Strategy #		Status	Responsible Department[1]	Fiscal Year					Cost	Potential Funding Sources[2]	Weighted STAPLEE Criteria[3]															Total STAPLEE Score	Priority for Community
											Benefits								*Costs*								
				7/2018-6/2019	7/2019-6/2020	7/2020-6/2021	7/2021-6/2022	7/2022-6/2023	Minimal <$1,000 Low < $10,000 Mod. < $100,000 High > $100,000		Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	**STAPLEE Subtotal**		
1	Form a committee to review planning documents and regulations in the Planning and Community Development Office and integrate appropriate elements of this HMP into those planning documents.	Carried Forward	PL	x					Minimal	OB	1	1	1	1	1	0	0	**6.0**	0	0	0	0	0	0	0	**0.0**	**6.0**	Medium
2	Identify locations and move forward with the pursuit of funding for the POCD's recommendation to add Fire Department substations in areas not adequately served by the existing Fire Stations.	Carried Forward	EM			x			High	OB	1	1	1	1	1	0.5	0.5	**7.5**	0	0	0	0	0	-1	0	**-2.0**	**5.5**	Medium
3	Collaborate with telecommunications companies to utilize the Norman Road Radio Tower to improve emergency communications between Town personnel.	New	EM	x					Moderate	OB	1	1	1	1	1	0.5	0.5	**7.5**	0	0	0	0	0	-0.5	0	**-1.0**	**6.5**	High
4	Coordinate with Wolverine Radio to display relevant hazard information (on a seasonal or event-specific basis) on Wolverine Radio screens located in Town Hall and other locations around Town.	New	EM		x				Moderate	OB	1	1	1	1	1	0.5	0	**7.0**	0	0	0	0	0	-0.5	0	**-1.0**	**6.0**	Medium
5	Develop a coordinated emergency communication plan that allows the Town to broadcast alerts through Wolverine Radio, Wolverine Radio's visual displays, the parent-communication system of the public school, and the Baptist Church belltower Public Address system.	New`	EM		x				Low	OB	1	1	1	1	1	0.5	0	**7.0**	0	0	0	0	0	0	0	**0.0**	**7.0**	High
6	Support the Avalonia Land Conservancy's acquisition of 74 acres of land in Griswold as part of the "Tri-Town Forest" property	New	PL	x	x	x	x	x	Minimal	OB	1	1	1	1	1	1	1	**9.0**	0	0	0	0	0	0	0	**0.0**	**9.0**	High
7	Pursue HMGP funding to extend flood wall towareds Wedgewood Road to prevent floodwaters from circumventing the existing wall and innundating the plant	Carried Forward	JCPU	x	x	x	x	x	High	CIB, HMA	1	1	1	1	1	1	1	**9.0**	0	0	0	0	0	-1	0	**-2.0**	**7.0**	High
8	Pursue funding to elevate/replace bridges which have been historically prone to scouring including Ashland Street over the Patchaug River	Carried Forward	DPW					x	High	CIB	0.5	1	1	1	1	0.5	0.5	**7.0**	0	0	0	0	0	-1	0	**-2.0**	**5.0**	Low
9	Pursue funding for the acquisitions or elevations of the approximately 35 condominium units on South Main Street that were flooded during the storm of March 2010.	Carried Forward	PL					x	High	CIB, HMA	0.5	1	1	1	0.5	0.5	0.5	**6.5**	0	0	0	0	0	-1	0	**-2.0**	**4.5**	Low
10	Develop formalized guidance for culvert and bridge construction and replacement that requires utilization of the most up-to-date extreme rainfall data from http://precip.eas.cornell.edu (update to Zoning Regulations Appendix 1 S:2.1)	New	DPW		x				Low	OB	1	1	1	1	1	0.5	0	**7.0**	0	0	0	0	0	0	0	**0.0**	**7.0**	High
11	Replace the bridge on Sheldon Road over Doaneville Pond to 1% annual-chance storm capacity	New	DPW		x				High	CIB	0.5	1	1	1	1	0.5	0	**6.5**	0	0	0	0	0	-1	0	**-2.0**	**4.5**	Low
12	Replace the bridge on Norman Road over Ashland Pond to 1% annual-chance storm capacity	New	DPW	x					High	CIB	0.5	1	1	1	1	0.5	0	**6.5**	0	0	0	0	0	-1	0	**-2.0**	**4.5**	Low
13	Remove the Carol Road Bridge and retire that road	New	DPW			x			Moderate	CIB	0.5	1	1	1	1	0.5	1	**7.5**	0	0	0	0	0	-0.5	0	**-1.0**	**6.5**	High
14	Review flood and stream-maintenance ordinances as part of the review of Town ordinances currently underway	New	PL	x					Minimal	OB	1	1	1	1	1	0	0	**6.0**	0	0	0	0	0	0	0	**0.0**	**6.0**	Medium
15	Conduct a floodplain study to determine the boundary of the floodplain adjacent to the Volunteer Fire Department Station 55; determine whether the boundary is close enough to the building to warrant construction of a flood-prevention retaining wall.	New	PL		x				Moderate	OB	1	1	1	1	1	0	0	**6.0**	0	0	0	0	0	-0.5	0	**-1.0**	**5.0**	Low
16	Add tree maintenance and trimming language into regulations wherever possible.	Carried Forward	DPW	x					Minimal	OB	1	1	1	1	1	0.5	0.5	**7.5**	0	0	0	0	0	0	0	**0.0**	**7.5**	High
17	Provide information for generally protecting residents during cold weather and for mitigating icing and insulating pipes at town residences.	Carried Forward	EM			x			Low	OB	1	1	1	1	1	0.5	0	**7.0**	0	0	0	0	0	0	0	**0.0**	**7.0**	High
18	Breach and remove the Route 138 / Slater Avenue Dam on the Quinebaug River	New	DPW				x		High	CIB	0.5	1	1	1	1	0	1	**6.5**	0	0	0	0	0	-1	0	**-2.0**	**4.5**	Low
19	Breach and remove the dam just downstream on the Quinebaug River	New	DPW				x		High	CIB	0.5	1	1	1	1	0	1	**6.5**	0	0	0	0	0	-1	0	**-2.0**	**4.5**	Low
20	Request that CT DEEP take over control of and responsibility for the Carroll Row Dam	New	PL	x					Minimal	OB	1	1	1	1	1	0	0	**6.0**	0	0	0	0	0	0	0	**0.0**	**6.0**	Medium
21	Remove the Rubber Pond Dams	New	DPW					x	High	CIB	0.5	1	1	1	1	0	1	**6.5**	0	0	0	0	0	-1	0	**-2.0**	**4.5**	Low
22	Griswold will need to address the addition of City Pond Dam to its list of significant and high-hazard dams. Information about dam failure and an EAP should be obtained as soon as possible.	New	EM	x					Moderate	OB	0.5	1	1	1	1	0.5	0	**6.5**	0	0	0	0	0	-0.5	0	**-1.0**	**5.5**	Medium

[1]Notes
DPW = Department of Public Works & Engineering
EM = Emergency Management
JCW = Jewett City Warden
JCPU = Jewett City Public Utilities
PL = Planning and Community Development

[2]Notes
CIB = Capital Improvement Budget
EOC = EOC Grants
HMA = FEMA Grant Programs
OB = Operating Budget

[3]Notes
Beneficial or favorable ranking = 1
Neutral or Not Applicable ranking = 0
Unfavorable ranking = -1

Technical and Economic Factors have twice the weight of the remaining categories
(i.e. their values are counted twice in each subtotal).

APPENDIX A

ADOPTION RESOLUTION

CERTIFICATE OF ADOPTION
TOWN OF GRISWOLD BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN UPDATE, 2017

WHEREAS, the Town of Griswold has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, dam failure, and wildfires)*, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Griswold Board of Selectmen approved the previous version of the Plan in 2012; and

WHEREAS, the Southeastern Connecticut Council of Governments, of whom the Town of Griswold is a member, has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update, 2017 under the requirements of 44 CFR 201.6; and

WHEREAS, committee meetings were held and public input was sought in 2016 and 2017 regarding the development and review of the Hazard Mitigation Plan Update, 2017; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedures for the Town of Griswold; and

WHEREAS, the Plan recommends several hazard mitigation actions that will provide mitigation for specific natural hazards that impact the Town of Griswold, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the Town of Griswold eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Griswold;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

Adopted this _____ day of _____, 201_ by the Board of Selectmen of Griswold, Connecticut

_____
First Selectman

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Griswold this _____ day of _____, 201_.

_____
Town Clerk

CERTIFICATE OF ADOPTION
BOROUGH OF JEWETT CITY

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN UPDATE, 2017

WHEREAS, the Borough of Jewett City has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, dam failure, and wildfires)*, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Griswold Board of Selectmen approved the previous version of the Plan in 2012; and

WHEREAS, the Southeastern Connecticut Council of Governments, of whom the Borough is a member, has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update, 2017 under the requirements of 44 CFR 201.6; and

WHEREAS, committee meetings were held and public input was sought in 2016 and 2017 regarding the development and review of the Hazard Mitigation Plan Update, 2017; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedures for the Borough; and

WHEREAS, the Plan recommends several hazard mitigation actions that will provide mitigation for specific natural hazards that impact the Borough, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the Borough eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Warden and Burgesses:

1. The Plan is hereby adopted as an official plan of the Borough of Jewett City;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

Adopted this _____ day of _____, 201_ by the Board of Warden and Burgesses

_____
Borough Warden

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Borough of Jewett City this _____ day of _____, 201_.

_____
Borough Clerk